

CONTENTS

GENERAL INFORMATION	1
PRE-MEETING ACTIVITIES	2
PROGRAM SCHEDULE	2
ABSTRACTS OF PLENARY SPEAKERS	7
ABSTRACTS OF SESSION SPEAKERS	10
PRESENTERS' CONTACT INFORMATION	30
INDEX	31
WHERE DO I GO? CAMPUS MAP	33

VIRTUAL BOOK STORE

We are very excited to partner with Christian Book Distributors (CBD) and announce the launch of our brand new online bookstore at:

<http://convention.christianbook.com/>.


Don't delay, check it out today!

This launch expands our available online resources, gives the website greater visibility, and allows us to offer books recommended by ASA readers at a discount to members and visitors alike, featuring books by ASA plenary speakers, ASA members, and others.

EXHIBITORS

We are pleased to welcome the following exhibitors to our meeting:

- Baker Books
- BioLogos
- Christian Women in Science
- InterVarsity Emerging Scholars Network
- InterVarsity Press
- Nexus Forums
- Reasons to Believe (RTB)
- Solid Rock Lectures



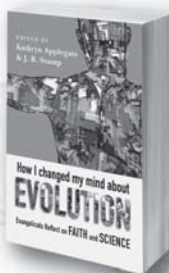
REASONS TO BELIEVE
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**WHERE SCIENCE AND
FAITH CONVERGE**

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BIOLOGOS
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Come visit us at Booth #3

And attend lectures by speakers from the BioLogos Voices program:
Ted Davis, Deb Haarsma, Ben McFarland, and Josh Swamidass.

biologos.org

GENERAL INFORMATION

EXHIBIT AND BOOK ROOM

The exhibits and book tables featuring books of interest to attendees are located in the Fermanian Conference Center in Wilden Hall.

Exhibit and Book Room hours:

Friday: 10:00 AM – 5:00 PM
Saturday: 9:45 AM – 5:15 PM
Sunday: 10:30 AM – 5:15 PM
Monday: 9:45 AM – 11:45 AM

PLENARY SESSIONS

The Saturday evening plenary session will be held at the anniversary dinner in Upper Turner Campus Center. All other plenary sessions will be held in Munson Chapel.

Friday: 7:30 PM **William “Bill” Newsome**, “Of Two Minds: A Neuroscientist Balances Science and Faith”
Saturday: 8:45 AM **Roger C. Wiens**, “Exploring Mars with Curiosity: A Scientific and Spiritual Journey”
Saturday: 8:00 PM **Edward “Ted” Davis**, “The Creation and Evolution of the ASA in Historical Context”
Sunday: 11:00 AM **Justin Barrett**, “Contemporary Trends in the Science of Religion: Adaptationist and Byproduct Theories and Their Implications”
Monday: 8:45 AM **Audrey Bowden**, “Imag(in)ing a Brighter Future for Healthcare”

SPECIAL EVENTS

Friday: 5:30 PM Student/Early Career Dinner Meetup
8:30 PM Fellowship Mixer
Saturday: 6:00 AM Morning Walk
7:00 AM Student/Early Career Breakfast Meetup
12:00 PM CWIS (Christian Women in Science) Lunch
6:15 PM 75th Anniversary Dinner, *business casual attire*
Sunday: 6:00 AM Hike
9:30 AM Worship Service
12:00 PM CSCA (Canadian Scientific and Christian Affiliation) Lunch
12:00 PM Student Lunch Discussion
6:00 PM Sand Volleyball Tournament
6:30 PM CWIS State of Women in ASA (open to all)
8:00 PM Ice Cream Social
8:30 PM State of the ASA
9:30 PM InterVarsity Reception / Meet the Plenaries
Monday: 6:00 AM Morning Walk

CAMPUS ATM MACHINE

is located next to the building MMED 1–4 and across from the Marshburn Library entrance. It is offered by America’s Christian Credit Union.

CAMPUS PARKING

is available in Lot A.

CAMPUS WI-FI NETWORK

is named “APUGUEST” and no password is required. Once you join, it will walk you through the process of creating a guest account to access the internet.

CAMPUS SAFETY:

626-815-3898 (or ext. 3898 from on campus)

MANY THANKS TO ...

Program Chair **Michael Everest** and Local Arrangements Chairs **Kathleen Tallman** and **Sarah Richart** for their countless hours of preparation.

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

THE ASA SPIRIT

The ASA 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.

PRE-MEETING ACTIVITIES

THURSDAY, 21 JULY 2016		
2:00 PM	Lodging Registration	Engstrom Residence Hall Lobby
2:00 PM	ASA Meeting Registration *	Engstrom Residence Hall Lobby
5:00 PM	Dinner	1899 Dining Hall, Lower Turner Campus Center (1st floor)
9:30 PM	ASA Meeting Registration closes	Engstrom Residence Hall Lobby
11:00 PM	Lodging Registration closes	Engstrom Residence Hall Lobby
* ASA Meeting Registration moves to Wilden, Fermanian Conference Center on Friday		

FRIDAY, 22 JULY 2016		
7:00 AM	Breakfast	1899 Dining Hall, Lower Turner Campus Center (1st floor)
8:00 AM	ASA Meeting Registration	Wilden Atrium
8:00 AM	Workshop: Five Online Sunday School Lessons on Science and Religion Denis O. Lamoureux , facilitator	Wilden 111 (Wyant Lecture Hall)
8:00 AM	Field Trip: Joshua Tree National Park *	Parking Lot A
8:30 AM	Lodging Registration opens	Engstrom Residence Hall Lobby
9:00 AM	Field Trip: Crystal Cove State Park *	Parking Lot A
9:00 AM	Field Trip: San Gabriel Mission and the Huntington Library *	Parking Lot A
10:00 AM	Exhibit and Book Room	Wilden 119 (Fermanian Conference Center)
12:00 PM	Lunch	1899 Dining Hall, Lower Turner Campus Center (1st floor)
1:00 PM	Workshop: Genomic Biotechnologies in Medicine—What Can Be Done, and What Should Be Done? Douglas Lauffenburger , facilitator	Wilden 111 (Wyant)
4:30 PM	Lodging Registration moves to Trinity Residence Hall	Trinity Residence Hall Office
11:00 PM	Lodging Registration closes	Trinity Residence Hall Office
* Please arrive 15 minutes before departure time.		

PROGRAM SCHEDULE

FRIDAY, 22 JULY 2016		
5:30 PM	Dinner	1899 Dining Hall, Lower Turner Campus Center (1st floor)
5:30 PM	Student/Early Career Dinner Meetup— <i>all are invited to sit together</i>	1899 Dining Hall, Lower Turner Campus Center (1st floor)
7:00 PM	Welcome, Introductions, Announcements <ul style="list-style-type: none"> • Leslie Wickman, ASA Executive Director • Vicki Best, ASA Director of Operations and Development • Jennifer E. Walsh, Dean, College of Liberal Arts and Sciences, Azusa Pacific University • Kathleen Tallman and Sarah Richart, Local Arrangements Co-chairs • Michael Everest, Program Chair 	Munson Chapel
7:30 PM	Plenary I: William “Bill” Newsome , “Of Two Minds: A Neuroscientist Balances Science and Faith” Moderator: Kevin Arnold	Munson Chapel (7)
8:30 PM	Mixer	Courtyard outside Munson Chapel
8:30 PM	ASA Meeting Registration closes	Wilden 119 (Fermanian Conference Center)
11:00 PM	Lodging Registration closes	Engstrom Residence Hall Lobby

PLEASE NOTE: Abstracts are found on the page numbers within the parentheses.

SATURDAY, 23 JULY 2016				
6:00 AM	Morning walk sponsored by the ASA Christian Women in Science affiliate; all are welcome <i>Take a short walk near campus to look at local plants and possibly wildlife, winding up a hill to views of the San Gabriel valley.</i>			Meet at Munson Hall
7:00 AM	Breakfast	1899 Dining Hall, Lower Turner Campus Center (1st floor)		
7:00 AM	Student/Early Career Breakfast Meetup	1899 Dining Hall, Lower Turner Campus Center (1st floor)		
8:00 AM	ASA Meeting Registration	Wilden 119 (Fermanian Conference Center)		
8:20 AM	Devotions Devotional: Reed Metcalf	Munson Chapel		
8:45 AM	Plenary II. Roger C. Wiens , "Exploring Mars with Curiosity: A Scientific and Spiritual Journey" Moderator: Jennifer Wiseman	Munson Chapel (7)		
9:45 AM	Exhibit and Book Room	Wilden 119 (Fermanian Conference Center)		
9:45 AM	Beverage Break	Wilden Atrium		
10:15–11:45 AM	I.A: Physical Science –Munson Chapel Moderator: Steven Ball	I.B: Teaching Science and Faith –Wilden 111 Moderator: Tom Ferko	I.C: Life and Environmental Sciences –Wilden 102 Moderator: Kevin Arnold	I.D: Literature, Bible, and Science –Wilden 103 Moderator: Michael Everest
10:15 AM	Arnold E. Sikkema (10) "Feeling the Cosmos: An Introduction to the 2015 Gravitational Wave Observation"	David C. Winyard Sr (10) and LeeAnn H. Coutts "What Does a Christian Need to Know about Science?"	Clayton D. Carlson (10) "Theological Implications of the Gut-Brain Axis"	Keith Miller (10) "Natural Evil and the Mythology of J.R.R. Tolkien"
10:45 AM	Dale L. Partin (11) "Extraterrestrial Intelligence?"	Bradley McCoy (11) "How Faith Integration Can Help Students Learn Science"	Jim Johansen (11) "Exploring the Application of Theological Method in Genomic Research"	E. Janet Warren (11) "Watering Barren Ground: Metaphor in the Brain, Bible, and Science"
11:15 AM	Kenell "Ken" J. Touryan (12) "Are We the Only Sentient Beings in the Universe?"	Craig Rusbult (12) "Education for Critical Thinking: Schrödinger's Cat in a Multiverse?"	Patricia Fitzgerald-Bocarsly (12) "Zika Virus, Dengue Virus, Ebola, Avian Flu, HIV, and Other Emerging and Re-emerging Pathogens: Where Do We Go from Here?"	
11:45 AM	Parallel Session 1 ends			
12:00 PM	Lunch	1899 Dining Hall, Lower Turner Campus Center (1st floor)		
12:00 PM	Christian Women in Science (ASA Affiliate) Lunch—All women are invited to sit together in the dining hall.			
1:15–2:45 PM	II.A: Literature, Bible, and Science –Munson Chapel Moderator: Michael Everest	II.B: Appropriate Technology and Stewardship –Wilden 111 Moderator: Martin Price	II.C: Life and Environmental Sciences –Wilden 102 Moderator: Kevin Arnold	II.D: Physical Science –Wilden 103 Moderator: Steven Ball
1:15 PM	Hugh Ross (13) "A Defense of Concordism in Light of Recent Scientific and Theological Research"	Gary DeBoer (13) "Use of Bio-char for Water Purification in Thailand"	Carl P. Fictorie (13) "A Tale of Two Francises"	Ben McFarland (13) "A World from Dust: How the Periodic Table Shaped Life (and the Brain)"
1:45 PM	Alan Dickin (14) "Why We Need to Re-examine the Day-Age Interpretation of Genesis 1"	Martin Price (14) "Appropriate Technology Center Supporting Those Working with the Poor"	Dominic M. Halsmer (14) "Hacking the Cosmos: Affordance-Based Reverse Engineering of Natural Systems"	Charles Kankelborg (14) "Chance and Creative Purpose"
2:15 PM	Paul Seely (15) "Why Didn't God Make Genesis Agree with Modern Science?"		Wayne Dawson (15) "Designing Molecular Machines in Biology: What Does That Mean for People of Faith?"	Randy Isaac (15) "Information and Misinformation in Life's Origins"

SATURDAY, 23 JULY 2016

2:45 PM	Refreshment Break				Wilden Atrium
3:15–5:15PM	III.A: 75th Anniversary of the ASA –Munson Chapel Moderator: Jack Swearingen	III.B: Teaching Science and Faith –Wilden 111 Moderator: Jim Buchholz	III.C: Mind Sciences –Wilden 102 Moderator: Janet Warren	III.D: Christian Women in Science (CWIS) Panel –Wilden 103 Moderator: Faith Tucker	
3:15 PM	Emily Ruppel (16) “Reintroducing <i>God & Nature Magazine</i> ”	Mitchell Mallery (16) “Universal Salvation: An Eschatological Ethic of Creation Care”	Nahanni Freeman (16) “Nondeterminism and Plasticity: The Role of Bidirectional Brain-Behavior Relationships in Sanctification”	Man, I Feel Like a Woman [Scientist]! (16) Panelists: Patricia Fitzgerald-Bocarsly Skyla Herod Se Kim Melissa Antonio	
3:45 PM	Justin Crick (17) “American Scientific Affiliation’s 75th Anniversary: History of ASA’s Views of Creation and Its Impact on American Evangelicalism”	James Walters (17) “Neuroscience Qualifies Free Will”	Mihretu P. Guta (17) “Mirror Neurons, Empathy, Intersubjectivity and the Second-Person Perspective with Implications for the Problem of Consciousness”	Calling All Men! (17) Panelists: Leslie Wickman Lynn Billman Ken Touryan Andrew Bocarsly	
4:15 PM	Davis A. Young (18) “Seventy-Five Years of Geology”	M. P. Worth McEwan (18) “Christian Apologetics and Science: Is Faith Intellectually Dishonest?”	Tony Jelsma and Bruce Vermeer (18) “Perseverance: Psychospiritual and Genetic Perspectives”	Ask Not What Your Students Can Do for You ... (18) Panelist: Hannah Eagleson	
4:45 PM	Terry M. Gray (19) “ASA Does Not Take an Official Position on Controversial Questions”	S. Joshua Swamidass (19) “Creation Pacifism: A Unifying Response to the Creation War?”	William K. A. Sikkema (19) “Carbon Nanotechnology, Neuronal Interfaces, and Self-perception”		
4:45 PM	ASA Meeting Registration closes		Wilden 119 (Fermanian Conference Center)		
5:15 PM	Exhibit and Book Room closes		Wilden 119 (Fermanian Conference Center)		
5:15 PM	Parallel Session III ends				
6:15 PM	75th Anniversary Dinner, <i>business casual attire</i> • Leslie Wickman and Vicki Best —Welcome, Introductions, Recognitions • Walter Hearn —Personal ASA testimony			Upper Turner Campus Center (2nd floor)	
8:00 PM	Plenary III. Edward “Ted” Davis , “The Creation and Evolution of the ASA in Historical Context” Moderator: Randy Isaac			Upper Turner Campus Center (2nd floor) (8)	

SUNDAY, 24 JULY 2016

6:00 AM	Hike the Big Dalton Canyon trail; all are welcome <i>Take a gentle to moderate hike along a stream in a secluded canyon in the local mountains.</i>	Meet in the Munson courtyard
7:30 AM	Breakfast	1899 Dining Hall, Lower Turner Campus Center (1st floor)
9:30 AM	Worship Music Leader: Astyn Turrentine Minister: Robert R. Duke , Professor and Chair, Undergraduate Biblical Studies Department, Azusa Pacific University Offering: Serenity Infant Care Homes	Munson Chapel
10:30 AM	ASA Meeting Registration	Wilden Atrium
10:30 AM	Exhibit and Book Room	Wilden 119 (Fermanian Conference Center)
10:30 AM	Beverage Break	Wilden Atrium

11:00 AM	Plenary IV. Justin Barrett , “Contemporary Trends in the Science of Religion: Adaptationist and Byproduct Theories and Their Implications” Moderator: Janet Warren				Munson Chapel (9)
12:00 PM	Lunch 1899 Dining Hall, Lower Turner Campus Center (1st floor)				
12:00 PM	CSCA (Canadian Scientific and Christian Affiliation Lunch— <i>All Canadians are invited to sit together in the dining hall.</i>				
12:00 PM	Student Lunch Discussion— <i>All students and early career are invited</i> Segerstrom 162 (Perry Lecture Hall)				
1:15–2:45 PM	IV.A: ASA VIP Symposium —Munson Chapel Moderator: Randy Isaac	IV.B: Teaching Science and Faith —Wilden 111 Moderator: Jim Buchholz	IV.C: Mind Sciences —Wilden 102 Moderator: Janet Warren	IV.D: Physical Science —Wilden 103 Moderator: Steven Ball	
1:15 PM	Featured VIP Members (20) John Wood Harold Stephens Martin Price	Deborah Haarsma (20) “BioLogos Public Engagement on Evolution and Christianity”	Peter Payne (20) “What Is a Person? Thomas Nagel’s Case against Materialism”	Stanley Klein (20) “What Does Quantum Physics Tell Us about Nature, Mind, psi and Divine Action?”	
1:45 PM	Featured VIP Members (21) Walt Hearn Jack Swearengen Ken Olson	Roberto Covolan (21) “The Process of Implementation of the Brazilian Association of Christians in Science”	Daniel Dorman (21) “Computational Neuroscience and Neuroplasticity: Implications for Christian Belief”	Andrew B. Bocarsly (21) “Correcting Our Behavior: Anthropomorphic Atmospheric Carbon Dioxide, a Defilement of the Land”	
2:15 PM	Featured VIP Members (22) Ken Touryan Leland Williams Phil Ogden	David Buller and Walter Rogero (22) “Science and the Next Generation of Religious Leaders: The AAAS Science for Seminaries Project”	Susan Billman (22) “Many Members, One Body: Implications of Current Practices in Culturally Responsive Psychometric Assessment in Schools”		
2:45 PM	Refreshment Break				Wilden Atrium
3:15–5:15 PM	V.A: Mind Sciences —Munson Moderator: Janet Warren	V.B: Teaching Science and Faith —Wilden 111 Moderator: Jim Buchholz	V.C: Appropriate Technology and Stewardship —Wilden 102 Moderator: Martin Price	V.D: Students/Early Career with Emerging Scholars Network (ESN) —Wilden 103	
3:15 PM	Kevin S. Seybold (23) “Cultural Psychology: Why Can’t We All Just Get Along?”	Emily Ruppel and Edgar Paul Herrington IV (23) “Nothing in Christianity Makes Sense Except in the Light of Evolution”	Lanny Vincent and Jack Swearengen (23) “A Case for Innovation Theology”	Growing Spiritually through Your Work in Science (23) Moderator: Tom Grosh Panelists: Dave Vosburg, Francis Su, Deb Haarsma	
3:45 PM	Paul Shrier, Cahleen Shrier , and Daniel Gillooley (24) “Anxiety, Fear, and Walking after the Spirit: Is Neurology Making the Bible Irrelevant or Can Neurology Have a Positive Impact on our Christian Lives?”	Bryan Isaac (24) “Progress and Pitfalls in Crafting an Educational Philosophy Statement on Origins”	William Jordan (24) “The Nature of Christian Engineering”	Finding Christian Mentors/Community in Science (24) Moderator: Sharon Carlson Panelists: Faith Tucker, Randy Isaac, Johnny Lin, Terry Morrison	
4:15 PM	Brad D. Strawn (25) “Extended Mind and Extended Religiousness: An Alternative to the Cognitive Science of Religion”	Fraser Fleming (25) “Exploring Belief through Science and Religion”	C. Ray Carlson (25) “Catalysis of the Human Spirit to Transform Others in Great Need: How Being a Project Manager in the Petroleum Industry Led to Amazing Results”	Thriving As a Science Student (Graduate or Undergraduate) (25) Moderator: Dwight Schwartz Panelists: Dorothy Boorse, Deb Haarsma, Josh Swamidass	
4:45 PM				Talking to Secular Colleagues about Faith (26) Moderator: Emily Ruppel Panelists: Dave Vosburg, Jennifer Wiseman, Josh Swamidass	

SUNDAY, 24 JULY 2016

5:15 PM	Parallel Session V ends	
5:15 PM	Exhibit and Book Room closes	Wilden 119 (Fermanian Conference Center)
5:15 PM	ASA Meeting Registration closes	Wilden 119 (Fermanian Conference Center)
5:30 PM	Dinner	1899 Dining Hall, Lower Turner Campus Center (1st floor)
6:00 PM	Sand Volleyball Tournament*	Volleyball Courts
6:30 PM	CWIS State of Women in ASA (open to all)	Wilden 102
8:00 PM	Ice Cream Social	Wilden Atrium
8:30 PM	State of the ASA	Wilden 111 (Wyant Lecture Hall)
9:30 PM	InterVarsity Reception / Meet the Plenaries	Wilden Atrium

MONDAY, 25 JULY 2016

6:00 AM	Morning Walk sponsored by the ASA Christian Women in Science affiliate; all are welcome <i>Join us on a walk around the East campus area with an emphasis on the local plants.</i>		Meet at Munson
7:00 AM	Breakfast	1899 Dining Hall, Lower Turner Campus Center (1st floor)	
8:15 AM	ASA Meeting Registration	Wilden 119 (Fermanian Conference Center)	
8:20 AM	Devotions Devotional: Heather Prior	Munson Chapel	
8:45 AM	Plenary V. Audrey Bowden , "Imag(in)ing a Brighter Future for Healthcare" Moderator: Kathleen Tallman	Munson Chapel (9)	
9:45 AM	Exhibit and Book Room	Wilden 119 (Fermanian Conference Center)	
9:45 AM	Beverage Break	Wilden Atrium	
10:15–11:45 AM	VI.A: Teaching Science and Faith –Munson Chapel Moderator: Tom Ferko	VI.B: Life and Environmental Sciences –Wilden 102 Moderator: Kevin Arnold	VI.C: Mentoring: Beyond the Buzzword –Wilden 103 Facilitator: Sharon Carlson
10:15 AM	Bill Roundy (27) "Benefits of Diversity in a Congregation"	Fazale "Fuz" Rana (27) "Is There a Biochemical Anthropic Principle?"	Part 1. (27) A Framework for Mentoring
10:45 AM	Dana Oleskiewicz (28) "Explaining Science within the Context of Faith: Lessons Learned from the Field of Citizen Science"	Anjeanette "AJ" Roberts (28) "Living Wisely in an Era of Gene Editing at Will"	Part 2. (28) Breaking through the Yoda Complex
11:15 AM	Ken Wolgemuth (29) "Introducing <i>Grand Canyon, Monument to an Ancient Earth: Can Noah's Flood Explain the Grand Canyon?</i> "	Johnny Wei-Bing Lin (29) "How the Nature of Nature and the Nature of Science Affects the Nature of Creation Care"	Part 3. (29) Practical Mentoring Near and Far
11:45 AM	Parallel Session VI ends		
11:45 AM	Exhibit and Book Room closes	Wilden 119 (Fermanian Conference Center)	
11:45 AM	ASA Meeting Registration closes	Wilden 119 (Fermanian Conference Center)	
12:00 PM	Lunch	1899 Dining Hall, Lower Turner Campus Center (1st floor)	
4:30 PM	Lodging Check-out *	Trinity Residence Hall Office	
	* PLEASE NOTE: Lodging check-out is at 10:00 AM for those staying Monday night.		

Plenary I
Friday, 22 July 2016

Munson Chapel
7:30 PM

Of Two Minds: A Neuroscientist Balances Science and Faith

Bill Newsome

The “central dogma” of neuroscience is that all our behavior and mental life—including our sense of a conscious, continuing self—is inextricably linked to the biology of the brain. Neuroscience “explanations,” therefore, tend to account for mental phenomena such as thought, emotion and belief in terms of the basic elements of cellular communication within the brain—action potentials, synapses and neuromodulation. Such mechanistic accounts, which appear increasingly powerful, have been cited as evidence that “folk psychological” explanations of behavior—including beliefs, values, and faith—will be replaced ultimately by deeper and more accurate neuroscientific explanations.

In contrast, I argue that the deepest and most accurate accounts of behavior necessarily involve multiple levels of explanation. Within neuroscience itself, the best explanations are inherently multilevel, appealing simultaneously to behavioral, circuit-level, cellular, and genetic insights. Outside the domain of neuroscience proper, human behavior depends additionally on multiple levels of social and cultural organization and insight. Each level of explanation complements and corrects, but does not replace, the others. More than ever in our world, beliefs, values and faith matter.

William “Bill” Newsome is the Harman Family Provostial Professor, Vincent V. C. Woo Director of the Stanford Neurosciences Institute, and Professor of Neurobiology at Stanford University. He has a BS from Stetson and a PhD from California Institute of Technology. He is the recipient of numerous honors and awards including being elected to membership in the American Philosophical Society, the Dan David Prize, and being elected to membership in the National Academy of Sciences. His research aims to understand the neuronal processes that mediate visual perception and visually guided behavior.



Plenary II
Saturday, 23 July 2016

Munson Chapel
8:45 AM

Exploring Mars with Curiosity: A Scientific and Spiritual Journey

Roger C. Wiens

NASA has embarked on a decades-long program to explore Mars. The primary motivation has been to understand the beginnings of life in our solar system, in particular, whether life—related or unrelated to terrestrial life—ever existed on Mars. The latest vehicle of this exploration has been the 1-ton Curiosity rover that landed in 2012. The mission successfully found vast evidence for a habitable environment, roving 12 km over lakebed and river environments, finding organic compounds.

Being near the forefront of this exploration as the leader of the ChemCam instrument has been an amazing and unexpected highlight of my life. This journey began over a decade ago. Competition for a place on the rover was intense and highly political. The main technique of our instrument—laser-induced breakdown spectroscopy—was considered an unlikely candidate, rarely used for geological studies, let alone for planetary science. The instrument development phase had its challenges. Just a year before the planned delivery of ChemCam to the rover, NASA announced its cancellation. Providentially, our instrument was restored to the rover, which, despite the odds, survived the perilous sky-crane landing on the red planet. For me this has been a journey of faith, chronicled in part in my book, *Red Rover: Inside the Story of Robotic Space Exploration* (Basic Books, 2013). My talk will cover both the scientific aspects of the mission as well as a personal account of the many events leading to the 7-minute descent onto the red planet.

Roger Wiens is a scientist at Los Alamos National Laboratory where he is principal investigator for the ChemCam instrument on the Mars Curiosity Rover. He has a BS in physics from Wheaton College and a PhD in physics from the University of Minnesota, Twin Cities. Previously he was flight payload lead for the GENESIS project, the first mission to return to Earth from beyond the moon. In addition to having published his scientific autobiography, *Red Rover* (Basic Books, 2013), he is a contributing author to the recent book, *The Grand Canyon: Monument to an Ancient Earth* (Kregel Publications, 2016).



**The Creation and Evolution
of the ASA
in Historical Context**

Edward “Ted” Davis

About three months before Pearl Harbor, the president of Moody Bible Institute invited five conservative Protestants in scientific fields to gather in Chicago to talk about the possibility of forming an organization “of science teachers who are Christians” in order to “help ministers and evangelists who are dealing with scientific subjects” and college students confronted with secular textbooks and instructors. That is how the American Scientific Affiliation began.

We have come a long way since that ambitious but humble beginning. This talk places the story of the ASA in the larger story of American religion and science in the twentieth century, identifying some of the forces and events that led to its creation and have influenced its subsequent evolution.



Edward B. (“Ted”) Davis is Professor of the History of Science at Messiah College and a former ASA president. Ted is editor (with Michael Hunter) of *The Works of Robert Boyle* and the author of dozens of articles and essays about the history of science and Christianity. His current project, supported by the National Science Foundation and the Templeton Foundation, examines the

religious activities and beliefs of prominent American scientists from the period between the two world wars. He also writes bi-weekly columns on historical topics for *BioLogos*.



**Congratulations,
Long-Time Member Attendees!**

We appreciate your faithful commitment to ASA.

65 years

Walter Hearn

57 years

Harold Stephens

55 years

Jerry Albert

50–54 years

George Giacomakis

Leland Williams

Myron Mann

Kenneth Olson

L William Yoder

Richard Humphrey

Terry Morrison

45–49 years

Stanley Anderson

Kenell Touryan

Philip Ogden

Martin Price

40–44 years

Walter Bradley

Stanley Moore

John Wood

Kenneth Martin

Jack Swarengen

Ronald Myers

Glenn Holt

Randall Isaac

Contemporary Trends in the Science of Religion: Adaptationist and Byproduct Theories and Their Implications

Justin Barrett

The cognitive and evolutionary sciences of religion are a major new shift in bringing science and theistic thought together. These two fields overlap in many ways but gravitate toward two different approaches to accounting for why people tend to believe in gods, the afterlife, and other religious beliefs.

Cognitive approaches emphasize religious thought as evolutionary byproducts of ordinary human cognitive systems. Evolutionary approaches tend to view religious expression as evolutionary adaptations.

Who is right and does it matter for Christian theology? Does one approach do more harm—or good—for warranted Christian belief? What do the explanatory possibilities on offer suggest about human nature and how God becomes known?

Justin Barrett is the chief project developer for Fuller Theological Seminary's Office for Science, Theology, and



Religion Initiatives (STAR) and director of the PhD in Psychological Science at Fuller Graduate School of Psychology. An experimental psychologist, Barrett taught for five years in Oxford University's School of Anthropology, and is best known for his research on the scientific study of religion. His authored books are *Why Would Anyone Believe in God?* (2004), *Cognitive Science, Religion, and Theology: From Human Minds to Divine Minds* (2011), and *Born Believers: The Science of Children's Religious Belief* (2012).

Imag(in)ing a Brighter Future for Healthcare

Audrey Bowden

Cancer. Infertility. Hearing loss. Each of these phrases can bring a ray of darkness into an otherwise happy life. The Stanford Biomedical Optics group, led by Professor Audrey Bowden, aims to develop and deploy novel optical technologies to solve interdisciplinary challenges in the clinical and basic sciences. In short, we use light to image life—and in so doing, illuminate new paths to better disease diagnosis, management and treatment.

In this talk, I will discuss our recent efforts to design, fabricate, and/or construct new hardware, software, and systems-level biomedical optics tools to attack problems in skin cancer, bladder cancer, hearing loss, and infertility. Our efforts span development of new fabrication techniques for 3D tissue-mimicking phantoms, new strategies for creating large mosaics, and 3D models of biomedical data, machine-learning classifiers for automated detection of disease, novel system advances for multiplexed optical coherence tomography, and low-cost technologies for point-of-care diagnostics.



Audrey Bowden is an Assistant Professor of Electrical Engineering at Stanford University. She holds a BSE in electrical engineering from Princeton University, a PhD in biomedical engineering from Duke University, and completed postdoctoral training in chemistry and chemical biology at Harvard University. She spent a short time as an International Fellow at Ngee

Ann Polytechnic in Singapore and as a Legislative Assistant in the United States Senate through the AAAS Science and Technology Policy Fellows Program sponsored by the OSA and SPIE. Bowden directs the Stanford Biomedical Optics group, whose mission is to develop and deploy novel tools for optical imaging at the microscale and nanoscale. The group also has a particular interest in the development of low-cost, portable technologies suited for use in poorly resourced environments.

I.A: PHYSICAL SCIENCES

Munson

Chapel

**Feeling the Cosmos:
An Introduction to the
2015 Gravitational Wave
Observation**

Arnold E. Sikkema

In 1609, Galileo turned a telescope to the heavens; the consequences of his observations were world-changing as this dramatically extended our ability to see beyond Earth. On February 11, 2016, the Laser Interferometer Gravitational-Wave Observatory (LIGO) published its detection of the merger of two black holes about 1.3 billion years ago, “felt” on September 14, 2015. Until now, it has been mainly electromagnetic radiation which has been able to inform us about the cosmos beyond our solar system.

I will summarize the historic prediction of gravitational waves as well as their earlier indirect confirmation, explain the observational and theoretical methods and results, and outline the potential of this new window into the cosmos. I hope to share both my excitement about the observation itself and my reflections on the character of science that the public dissemination and reception of this discovery revealed.

**I.B: TEACHING SCIENCE
AND FAITH**

Wilden

111 (Wyant)

**What Does a Christian Need
to Know about Science?**David C. Winyard Sr and
LeeAnn H. Coutts

Mount Vernon Nazarene University (MVNU) is a Christian, co-educational, liberal arts, teaching institution based in the Wesleyan-holiness tradition.

In fall 2014, MVNU added a new class to its General Education Core: Science and the Modern Mind. This two-credit class, which is required for all graduates, “explores science from philosophical, historical and cultural perspectives, examining both the robust character of scientific inquiry and its limitations.”

Drawing on resources from science, history, and theology, it examines the question, “How do—and how should—science and faith relate?” To date, several members of MVNU’s School of Natural and Social Sciences have taught Science and the Modern Mind using a number of different approaches.

In spring 2016, yet another method employed *When God and Science Meet*, a National Association of Evangelicals (NAE) booklet produced in 2015 with American Scientific Affiliation support. MVNU’s experience launching and teaching this class, and its use of the NAE booklet, provide insights into the challenges Christian universities face developing students that are prepared to live out their faith in today’s technoscientific world.

**I.C: LIFE AND ENVIRON-
MENTAL SCIENCES**

Wilden

102

**Theological Implications
of the Gut-Brain Axis**

Clayton D. Carlson

Advances in DNA sequencing technologies have revolutionized our understanding of human bodies and the microbes that inhabit them, the microbiota. We now understand more clearly that healthy humans are made up of a series of related, but distinct, ecosystems that are each inhabited by diverse and complex communities of microbes.

Our relational God has made humans that depend on relationships with microbes. The makeup of the microbiota depends on an individual’s diet, environment, personal hygiene, and even the people with whom he or she interacts. Human health depends on how we relate to the microbes that populate us.

The most important human ecosystem is the large intestine, or gut. The microbes that live within the gut have sweeping health effects for digestive, cardiovascular, and even psychological health. The effects of gut microbes on brain health, development, and function is referred to as the gut-brain axis.

This presentation will explore the theological implications of the human microbiota and will begin a conversation about how the ways we relate to our microbes may affect our minds and therefore the ways we relate to our God.

**I.D: LITERATURE, BIBLE
AND SCIENCE**

Wilden

103

**Natural Evil and the
Mythology of J.R.R. Tolkien**

Keith Miller

The pain and suffering embedded within creation seems to some of us to be in irreconcilable conflict with a good and loving God. Such profound theological and moral questions do not yield easily to discussion within traditional theological constructs. In our debates over God’s character and the nature of good and evil, the words and mental categories that we use can act as barriers to apprehending truths that might provide deeper insight.

Any thinking about the character and will of God necessitates that we use symbols and analogies. Our understanding of God is mediated through our creative imagination as inspired by the Spirit and informed by the Word. The human imagination as expressed in myth and fantasy is one way that can enable us to see age old theological and moral questions within a new context.

In the *Silmarillion*, J. R. R. Tolkien has provided us with an imaginative mythology that can open new perspectives on God’s creative activity and the nature of creation. Two important themes of Tolkien’s vision can perhaps stimulate our own theological imaginations. The first is that all creative power lies exclusively with God—the creation can thus not be anything but consistent with God’s creative will. All that comes into being has its ultimate source in God’s will and power. Secondly, the embodiment of God’s creative will into physical reality is mediated. The creation itself is given freedom, but a freedom that makes possible God’s ultimate purpose.

I.A: PHYSICAL SCIENCES
(CONT'D)

Munson

Chapel

Extraterrestrial Intelligence?
Dale L. Partin

The discovery of exoplanets orbiting distant stars has now become routine. The widespread presence of organic molecules in space is leading many scientists to say that life must be abundant in our galaxy. Attempts to detect radio signals from exoplanets are ongoing, but difficult because of the vastness of space. Optimists are making headlines, creating an atmosphere of expectancy that alien life will soon be found. This sense of anticipation has been supported by the Principle of Mediocrity which observes that there is nothing special about our place in the universe and by the evidence that life started relatively quickly on Earth after it became habitable. There is a history of failed predictions that we would detect alien life within ten years.

While some Christians have been "optimists," others have used the Anthropic Principle to say that intelligent life may be rare or nonexistent beyond the earth. Thus, the debate has sometimes been between "prolife" atheists and "antilife" Christians. However, a fresh look at the Bible shows a potential openness to intelligent beings elsewhere. It also raises interesting questions about whether intelligent aliens would be in the image of God and about provision for their salvation.

For God so loved the *kosmos* (world or cosmos) that he gave his one and only Son ...

I.B: TEACHING SCIENCE AND FAITH (CONT'D)

Wilden

111 (Wyant)

How Faith Integration Can Help Students Learn Science
Bradley McCoy

Though some think of learning in a science classroom as being driven primarily by discipline content, epistemological and affective factors play substantial roles in student learning. For example, students are more likely to persist in science fields and to be more engaged in their learning if they feel self-efficacy in science based on their identity and personal values. Furthermore, students who have more expert-like epistemological beliefs about the nature of science and the nature of learning are likely to learn more efficiently in science coursework.

In this session, I will describe activities in introductory physics classes designed to support students' science identity and epistemology in the context of faith integration.

I will also present data on the impact of these faith integration activities on students' epistemologies and compare with previous research on epistemology from the physics education research literature.

I.C: LIFE AND ENVIRONMENTAL SCIENCES
(CONT'D)

Wilden

102

Exploring the Application of Theological Method in Genomic Research

Jim Johansen

This presentation explores theological method in scientific research. Genomes contain multilevels of information far beyond a simple coded sequence of nucleotides. Does including theological method in scientific research produce better results? How historically has theological method aided science? How can integration resolve scientific challenges and theological mysteries? What theological method tools are useful for framing genomic research?

David Clark's theological utility arguments are applied showing how theology (1) explains how the orderly universe is prone to mathematical interpretation, (2) provides a metaphysical foundation for science, (3) explains why science is important and scientific knowledge is valuable, (4) suggests future scientific research, and (5) compare scientific theories.

Vern Poythress's God and scientific law parallels and perspective filtering are leveraged. Divine attributes are mirrored in nature. Perspective filtering is useful in theology and science. Science applies filters to elucidate relationships (e.g., nucleotide sequence functionality and spectral analysis). Theology applies filters to explore themes such as divine attributes, miracles, and temporal revelation.

Potential outcomes include the following: improved data assessment via an integrative science and theology frame of reference, science and theology sharing to solve complex problems, innovative design of experiments influenced by theological and scientific methods, more informed genomic information analysis and functional evaluation tools and approaches, and greater insight into theological truths via theologically informed scientific exploration.

I.D: LITERATURE, BIBLE AND SCIENCE
(CONT'D)

Wilden

103

Watering Barren Ground: Metaphor in the Brain, Bible, and Science

E. Janet Warren

One cannot attend an ASA meeting without encountering passionate discussions about biblical and scientific views of origins. One underrepresented factor in these discussions is that scientists (and Western society in general) often privilege logical and analytical approaches. Conversely, they tend to neglect nonanalytical and creative approaches.

Yet, those in the ancient world, in which the Bible was written, lived and learned through narrative, myth, metaphor, and symbol. Furthermore, current neurocognitive science has shown that humans engage their world using two neural processes, which can be loosely labelled analytical and nonanalytical. Both are needed.

In this presentation, I suggest that an increased understanding of "nonanalytical" figurative language can advance the science-faith dialogue, and the origins issue in particular. I will review linguistics and contemporary metaphor theory, and discuss the use of metaphors and models in the Bible, theology, and science. For further illustration, I will discuss various models of creation in the Bible.

When we view the Bible using only our "scientific" analytical eyes, we risk seeing only barren ground and missing the rich symbolism sprinkled throughout the Word of God. Employing the "eyes of our hearts" may enrich our understanding of the multi-layered biblical views of creation and open new doors toward science-faith integration.

I.A: PHYSICAL SCIENCES
(CONT'D)

Munson

Chapel

Are We the Only Sentient Beings in the Universe?

Kenell "Ken" J. Touryan

As a person gazes into the starry night, and is told of trillions upon trillions of stars that make up the known universe, many of which may have planets orbiting them, the age old question arises, is there intelligent life on one or more of these planets? If so, do we have any knowledge of them? Or, as Enrico Fermi wondered, "Where are they?"

For over four decades, astronomers have been listening to possible signals from outer space (e.g., SETI) that would indicate the existence of intelligent life elsewhere in the universe. Carl Sagan's movie, *Contact*, was an attempt to excite our imaginations by depicting the efforts to distinguish signals that are of intelligent origin from interstellar noise. The recent movie *Interstellar*, explores means of traveling the prohibitive intergalactic distances through worm holes.

In this talk, we will review the conditions for life to exist on Earth. It will emphasize the importance of long molecular chains that form the template upon which life exists, namely, carbon and hydrogen atoms. We will then present the stringent requirements for a planet to have favorable conditions for life to emerge, including the existence of sentient beings.

For the Christian, the incarnation of Christ shows a special concern for planet Earth by the Creator himself (John 3:16). Does this in itself underscore the uniqueness of human beings on planet Earth and thus in the universe?

I.B: TEACHING SCIENCE AND FAITH (CONT'D)

Wilden

111 (Wyant)

Education for Critical Thinking: Schrödinger's Cat in a Multiverse?

Craig Rusbult

An important goal of ASA is helping improve the quality of critical thinking in schools (K-12, college, graduate) and churches, and in society. To do this, two useful strategies are creative educational uses of critical thinking activities (such as recognizing and minimizing uses of logical fallacies) and problem-solving design thinking, as described in a model of Design Process that is an extension of my PhD work about scientific methods.

We'll look at three science-and-faith issues: (1) Quantum Physics, in variations of Schrödinger's Cat Experiment (using cat or type-writer, electron or dice, with time delay) to see why observation by a human does not "collapse the wave function" and "create reality" for the cat, and why a Many Worlds Interpretation is not scientifically useful; (2) Multiverse Theology that seems satisfactory for a normal multiverse, but not for quantum-splitting into many worlds; and (3) Young-Earth Creationism.

These issues illustrate interactions between logical evaluations (of science-evidence from observing nature, and theology-evidence by observing scripture) and worldview-related psychology/sociology influences.

We'll examine these factors, along with lessons from my high school teacher who helped us improve our understanding (of all perspectives) and respecting (by recognizing that differing views can be defensible, logically and ethically), thus encouraging appropriate humility that is not too little and, avoiding radical postmodern relativism, is not too much.

For more information, designprocessineducation.com/asa

I.C: LIFE AND ENVIRONMENTAL SCIENCES
(CONT'D)

Wilden

102

Zika Virus, Dengue Virus, Ebola, Avian Flu, HIV, and Other Emerging and Re-emerging Pathogens: Where Do We Go from Here?

Patricia Fitzgerald-Bocarsly

The 20th century brought amazing advances in vaccine technology, leading to the control of many infectious diseases, and, in the case of smallpox, the complete elimination of the virus in the wild. However, despite novel vaccine approaches of the 21st century, and the development of effective anti-retroviral drugs, the world continues to face the emergence and re-emergence of viral and bacterial pathogens with what appears to be increasing regularity. Just in the last decade, we have seen the emergence of Ebola, Dengue, Avian Flu and most recently, Zika virus infections that have become, or are at risk of becoming, pandemic, joining HIV and TB.

In this presentation, the author, who is a viral immunologist specializing in HIV immunology, will discuss how viral diseases "emerge" or "re-emerge" and how viruses exert significant amounts of their genetic machinery to subvert the immune response. Vaccine strategies, whether particular viruses can be eliminated, the role of "herd immunity," antiviral and immune support and public health policies that will be needed to combat these diseases will be discussed.

Moreover, the needed humanitarian response of believers—as research scientists, as health care workers, and as financial supporters—will be addressed.

I.D: LITERATURE, BIBLE AND SCIENCE
(CONT'D)

Wilden

103

No scheduled talk.

II.A: LITERATURE, BIBLE AND SCIENCE

Munson

Chapel

A Defense of Concordism in Light of Recent Scientific and Theological Research

Hugh Ross

Belief that the Bible's words can be harmonized with the scientific record is widely questioned and largely rejected (or redefined) even within the evangelical community.

Vague concordism seems most prevalent, the idea that the Bible contains virtually no scientific content and therefore offers very little material to harmonize. This position has developed at least partly, if not primarily, as a reaction to rigid concordism, the belief that virtually every Bible passage has scientific content, much of it specific and detailed, and thus calling for extensive harmonization. I see both approaches as unnecessary and indefensible extremes.

I propose a moderate concordism, examining those passages that do seem clearly to describe or imply scientific truth and showing how they do, indeed, accord with well-established research findings. This view presumes that the Bible has been inspired to communicate truth to all generations of humanity.

Something valuable is lost when we read either too little or too much science into biblical texts. Moderate concordism calls for thoughtful integration of all biblical passages relevant to the natural realm and data from all relevant scientific disciplines. The ultimate test of a moderate concordist's approach is whether harmonization becomes clearer or less so in light of advancing scientific and theological understanding.

In this talk I will show the increasing success of harmonizing specific texts with established scientific understanding.

II.B: APPROPRIATE TECHNOLOGY & STEWARDSHIP

Wilden

111 (Wyant)

Use of Bio-char for Water Purification in Thailand

Gary DeBoer

The use of charcoal has been a traditional tool in water purification; however, production of charcoal in rural settings is time consuming and the quality may be poor.

I recently attended a workshop in Thailand in which top-lit gasifiers were used to produce high-quality charcoal in a short period of time.

We incorporated this bio-char into two different water purification systems.

The method for producing charcoal and the water purifications systems are appropriate for rural, less-resourced areas, allowing us give drink to those who are thirsty.

II.C: LIFE AND ENVIRONMENTAL SCIENCES

Wilden

102

A Tale of Two Francises

Carl P. Fictorie

In 1970 Francis Schaeffer, founder of L'Abri Fellowship, penned a seminal work articulating a biblical critique of the still young ecological crisis, *Pollution and the Death of Man*.

Forty-five years later, Pope Francis penned another important work articulating a biblical critique of the now mature ecological crisis, the encyclical *Laudato Si'*.

While representing two different theological traditions and different cultural settings, there is much in common between these two books.

This presentation seeks to critically compare these two writings, outlining the timeless and biblical truths about the nature of the universe and the role of humanity within it.

In making this comparison, the paper will also show how the picture of environmental ethics has changed in the many years between these two publications.

II.D: PHYSICAL SCIENCES

Wilden

103

A World from Dust: How the Periodic Table Shaped Life (and the Brain)

Ben McFarland

The stacked boxes in the Periodic Table of the Elements hold surprises. These elements tell a story that gives a hidden order to chemistry, geology, biology, and even history.

A World from Dust, published by Oxford University Press in 2016, traces billions of years of evolution, beginning with math and ending with us. In particular, oxygen was a key that changed the world and shifted the periodic table toward new elements and new possibilities in a predictable sequence.

In this session, I will discuss the philosophy and theology that underlie my book's narrative. In the book I challenge some aspects of Stephen Jay Gould's "Tape of Life" theory by suggesting ways in which the order of the periodic table produced a chemical sequence that constrained the random flow of biology. Chemistry made certain aspects of evolution predictable, which allows us to detect a broad narrative embedded in the *logos* of the universe. For example, this narrative explains why ancient cells rejected sodium and calcium, and then millions of years later used those two elements for different aspects of neural signaling.

The narrative of chemistry helps us understand which elements the brain uses and how it uses them. This story shows that we are at home in a multilayered universe, in which chemical order constrains, and is enlivened by, biological contingency and randomness.

II.A: LITERATURE, BIBLE AND SCIENCE (CONT'D)

Munson

Chapel

Why We Need to Re-examine the Day-Age Interpretation of Genesis 1

Alan Dickin

The day-age theory is one of the most popular old-Earth interpretations of Genesis chapter one, but its greatest challenge remains the order of the creation account, as first discussed by Origen. The day-age theory was developed by nineteenth-century scientists in order to reconcile "modern" science with the Genesis text; however, the creation of plants on Day 3 before the sun on Day 4 was their most difficult challenge.

One of the early proponents of the theory was the nineteenth-century geographer Arnold Guyot. In his 1884 treatise on creation, Guyot ascribed a kind of semi-living status to plants in order to explain how they could exist when the earth was so hot that it was surrounded by a "luminous envelope" resembling a stellar nebula.

Later variants of the day-age theory have offered more sophisticated explanations of this problem, but they still have great difficulty making geological evidence fit the Genesis account. This approach to Genesis is not helpful, since it treats the text as a modern scientific treatise, contrary to its ancient cultural context.

Those who seek to reconcile science and faith should look for a deeper meaning in Genesis 1 that is more consistent with the evidence for its own origins as a carefully redacted ancient canonical source. This means embracing some aspects of the documentary hypothesis as a correct explanation for the development of the inspired text.

II.B: APPROPRIATE TECHNOLOGY & STEWARDSHIP (CONT'D)

Wilden

111 (Wyant)

Appropriate Technology Center Supporting Those Working with the Poor

Martin Price

The working appropriate technologies (AT) at ECHO International's Fort Myers, Florida, farm serve as a demonstration, a teaching tool, and a place to try new technologies or designs. It is especially targeted to people who are working with small-holder farmers in tropical and subtropical countries or who are preparing for such work. It is also a resource for engineering faculty and students at universities who are interested in this aspect of engineering.

We demonstrate, research, and build tools and techniques that solve problems and improve quality of life in areas related to agricultural production in general. Examples include pumping and purifying water, energy-efficient cook stove options, crop processing and storage, solar technologies, bamboo treatment and use, and shelter construction techniques for small-scale farmers.

Appropriate technologies may appear simple compared to high-tech gadgetry, but it takes skillful design and ingenuity to make essential resources from only what is available locally.

My goal in this talk is to acquaint delegates with an interest in AT with resources available to them at ECHO (including a 14-month internship for a college engineering grad each year). I am not aware of a comparable resource in the United States.

For more information, visit www.echonet.org and www.echocommunity.org.

II.C: PHYSICAL SCIENCES (CONT'D)

Wilden

102

Hacking the Cosmos: Affordance-Based Reverse Engineering of Natural Systems

Dominic M. Halsmer

The concepts of reverse engineering and affordances have been combined to produce a fruitful synergy with the potential for advancing systems biology. The idea of affordances has found utility, not only in design engineering, but also in affordance-based reverse engineering (ARE).

In this context, an affordance is something that is provided to the end user of an engineered device, by virtue of some relationship between the user and the device. In more complex systems, this is extended to include a relationship between parts of a system that play a role in ultimately providing a capability to the end user. These part-to-part affordances are critical in analyzing the depth of functionality that characterizes biological systems, especially at the microscopic level.

Researchers in evolutionary biology have also found the concept of affordance to be helpful in understanding the evolutionary process. Affordances can assist in clarifying the process of niche construction. Hence, it seems clear that ARE has the potential to contribute at both the microscopic and macroscopic levels.

Furthermore, an affordance merely provides a statement of capability that persists because of key biological relationships. Thus, it is metaphysically neutral, and as such, more in keeping with the concerns and limits of science. Even so, the nested structure of affordances throughout the realm of nature points to an engineering influence that pervades and illuminates all of creation.

II.D: LIFE AND ENVIRONMENTAL SCIENCES (CONT'D)

Wilden

103

Chance and Creative Purpose

Charles Kankelborg

Scientific descriptions of the physical world incorporate random (synonym: chance) processes at many levels, from underlying quantum mechanical distributions to mutations in evolutionary biology and the chaotic dynamics of weather systems.

A brief consideration of the relevant physics indicates that random processes are not merely apparent, but essential to the universe in which we live.

A Christian aversion to explanations involving chance can be traced to the Church Fathers grappling with the ideas of the early atomists.

In today's radically different scientific and cultural context, many believers and nonbelievers apparently share a deeply rooted presupposition that chance is incompatible with purpose.

I will articulate a precise definition of chance within a mathematical and scientific framework and then inquire as to its significance to broad questions of meaning and purpose. An analogy with computer algorithms illustrates that random chance can be a powerful expression of conscious creativity and purpose.

Returning to the scientific understanding of our world, I argue that random chance has an appropriate place in a world governed by divine intention.

II.A: LITERATURE, BIBLE AND SCIENCE (CONT'D)

Munson

Chapel

Why Didn't God Make Genesis Agree with Modern Science?

Paul Seely

The question that I am asking has particular reference to Genesis 1–11. Since even those few chapters would be too much for this talk, the talk will use Genesis 1:2 as a representative sample.

After showing that the concepts in that verse are ancient Near Eastern and are contrary to modern science, the talk will proceed to answer the question posed.

The answer to the question will be cross-disciplinary. It will rest on both divine revelation and natural knowledge, biblical theology and anthropology.

The divine revelation will come primarily from two biblical texts which are applicable not only to the question at hand but also to numerous other Bible and science questions.

The natural knowledge will come broadly from anthropology. It will be adduced specifically from the practice of missionary Bible translators and from lessons learned by secular cross-cultural experience.

II.B: APPROPRIATE TECHNOLOGY & STEWARDSHIP (CONT'D)

Wilden

111 (Wyant)

No scheduled talk.

II.C: PHYSICAL SCIENCE (CONT'D)

Wilden

102

Designing Molecular Machines in Biology: What Does That Mean for People of Faith?

Wayne Dawson

Over the years, I have been working on methods to predict the structure and dynamics of biomolecules using various coarse-grained techniques that aim at the 3D structure. In particular, I have aimed at prediction of RNA structure, protein-RNA interactions and (to some extent) RNA-ligand and protein-protein binding.

Though prediction itself remains quite troublesome, the logical extension and aim of prediction is to eventually know how to design biomolecules to solve various medical problems as well as to carry out other tasks.

Presently, we are still quite far away from a time when we can specify a molecule with certain properties and a computer will generate a properly designed drug candidate, or build a molecular machine that accomplishes some essential medical task.

Though genuine engineering-science in biology is presently mostly pipe-dreams, the principles of folding, interaction, and design are quite clearly deterministic; and this appears increasingly certain not go away.

As we observe the body of science growing in cosmology and biology, and much of that along data-driven and highly deterministic lines, how then can we still say that the heavens and the earth speak to the glory of God?

Moreover, as we open these doors to design, how can those of us who hear that call to pursue science to the very edges of understanding (and sometimes are troubled with the questions we ask) still find a place in the world to honor God?

II.D: LIFE AND ENVIRONMENTAL SCIENCES (CONT'D)

Wilden

103

Information and Misinformation in Life's Origins

Randy Isaacs

Ever since Crick and Watson deciphered the structure of DNA, the concept of DNA information has dominated the study of biological evolution. Genome sequencing has become sufficiently cost effective to enable its widespread use in determining the specific information stored in any particular DNA molecule.

Nevertheless, the concept of information is often poorly understood, especially in the application to biology. Different disciplines use different definitions of information and the confusion leads to inaccurate understanding.

The term "information" has many definitions. It is helpful to think of these definitions as a hierarchy of information types, ranging from a thermodynamic foundation in which all distinguishable physical states constitute information to the highest semantic level of function or meaning. Another way of describing information is to differentiate between digital and analog information, both of which are abundant in nature.

This talk begins with a discussion of the definition of information and the application to biological information. Analyzing two common myths of information, it is shown that the retention of functional information is a critically important aspect of biological evolution which may apply to chemical evolution. Research into the origins of life must consider ways in which functional information is retained.

III.A: 75TH ANNIVERSARY OF THE ASA

Munson

Chapel

**Reintroducing
God & Nature Magazine
Emily Ruppel**

God & Nature (G&N) magazine has been a publication of the American Scientific Affiliation since spring 2012. Four years after its launch, G&N has grown and matured into a unique publication, offering essays and scholarship from scientists, theologians, and lay writers around the world.

With a special topic of focus every season, G&N's unique format offers science and faith conversation "beyond the origins controversy," in which exciting, emerging, and exotic aspects of the relationship between science and theology can be explored in depth.

This session will serve as a reintroduction of the magazine to ASA/CSCA members with emphasis on best practices for submission and tips for how to use this resource in college or Sunday school classrooms.

III.B: TEACHING SCIENCE AND FAITH

Wilden

111 (Wyant)

**Universal Salvation:
An Eschatological Ethic of
Creation Care
Mitchell Mallary**

For nearly two millennia, the church has sought to ground ethics in *protology*, or what Martin Luther referred to as the "ordinances of creation."

In other words, a part of the ethical summons of the church was to discover and follow these universally accessible ordinances of creation (natural law), whether that concerns marriage, gender roles, the state, government, or stewardship of the earth. But with the recently pervasive nihilism of escapism, being good stewards of the earth seems futile, and was even described by D. L. Moody as "polishing a sinking ship."

This presentation seeks to reverse this fatalistic trend. Rather than grounding ethics in *protology*, I argue that we should instead ground ethics in *eschatology*.

In defending this thesis, I attempt to show the lack of biblical evidence for escapism and protological ethics by highlighting the vision of the coming New Jerusalem in the final chapters of the book of Revelation and by engaging the theology of Jürgen Moltmann and Karl Barth.

And finally, I offer a provisional and tentative outline of what it would look like if we began to ground ethics—and particularly environmental ethics—in the universal portrait of salvation of the biblical witness. If the new creation is indeed a renewed and transformed world, then the church's summons to steward the earth is not merely because it is a divine ordinance, but rather is the logical overflow of realizing that God redeems not only humanity, but the world too.

Protology says to "steward creation because it is an ordinance from God." Eschatology says that "God saves creation, and we must treat it accordingly."

III.C: MIND SCIENCES

Wilden

102

**Nondeterminism and
Plasticity: The Role of
Bidirectional Brain-
Behavior Relationships
in Sanctification
Nahanni Freeman**

Theoretical models of sanctification imply behavioral, affective, cognitive, and relational flexibility, and appear inconsistent with deterministic views of mind-body relationships.

New evidences from epigenetics, psychoneuroimmunology, and studies of placebo effects, as well as traditional findings regarding neuroendocrine, dendritic, and neurotransmitter modifications in response to psychological variables, highlight the malleability of the central nervous system in response to both internal and external environmental change agents.

Might such plasticity help to explain the positive associations observed between health-conducive spirituality and mental and physical health?

Evidence for nondeterministic, bidirectional brain-behavior relationships may suggest that sanctification, hope, and health-conducive spirituality may beneficially alter biological systems.

Evidences for bidirectionality may weaken neural identity theory and material monism, yielding intriguing compromises between mind-body interactionism and emergentism.

III.D: CWIS PANEL

Wilden

103

**Man, I Feel like a Woman
[Scientist]!**

Moderator: Faith Tucker

Panelists:

**Patricia Fitzgerald-Bocarsly
Skyla Herod
Se Kim**

Shania Twain might know what it's like to feel like a woman, but do you know what it's like to feel like a woman scientist?

Women make up only one quarter of those working in the sciences, and their experiences in the laboratory, classroom, and industry are unique and varied.

Join the Christian Women in Science (CWIS) for a diverse panel of women discussing their experiences, joys, and challenges of being a Christian woman working in the sciences.

III.A: 75TH ANNIVERSARY OF THE ASA (CONT'D)

Munson

Chapel

American Scientific Affiliation's 75th Anniversary: History of ASA's Views of Creation and Its Impact on American Evangelicalism
Justin Crick

The purpose of this research is to review publications and works of ASA members over the past 75 years and discuss their perspectives on the Genesis creation narrative.

The goal is to show how views on creation have shifted over the course of the 20th century, and present contemporary perspectives held by current ASA members.

Upon examination, it becomes clear that over ASA history, there has been a shift from young and old earth creationism toward diverse views of evolutionary creationism.

This research highlights the history and importance of ASA's perspectives on creation, and its role in American evangelicalism.

III.B: TEACHING SCIENCE AND FAITH (CONT'D)

Wilden

111 (Wyant)

Neuroscience Qualifies Free Will**James Walters**

"(P)hilosophy is dead ... Why is there something rather than nothing? Why do we exist? We shall attempt to answer it in this book [*The Grand Design*]," say Stephen Hawking and Leonard Mlodinow (Bantam Books, [2010], 5, 10).

"I hope to show that when talking about values, we are actually talking about an interdependent *world of facts*," says Sam Harris in his latest book *The Moral Landscape: How Science Can Determine Human Values* (Free Press, [2010], p. 4, Italics added).

Contra Hawking, Mlodinow, and Harris, I will argue that neuroscience does not supplant ethics, but rather supplements it. Actually, neuroscience is a boon for ethics, despite how some neuroscientists—Harris is one—needlessly discount the nonsciences.

I will first unpack the relatively new term, *neuroethics*, and then discuss some neuroscientific discoveries relevant to ethics.

Finally, I explore neuroscience's contribution to the discussion of free will, and argue for the complementary nature of neuroscience to all the humanities.

III.C: MIND SCIENCES (CONT'D)

Wilden

102

Mirror Neurons, Empathy, Intersubjectivity and the Second-Person Perspective with Implications for the Problem of Consciousness**Mihretu P. Guta**

There are two central claims that are said to characterize what I shall call *the functional properties* of mirror neurons (MN). These are (1) MN respond/fire when someone reaches for an object in a goal oriented manner; and (2) MN respond/fire when someone watches another person reach out for an object. The functional properties in (1) and (2) are described by neuroscientists/psychologists as instances of *action execution* and *action understanding* respectively.

One of the central assumptions of the theory of MN has to do with the role they are said to play in mirroring the mind of another person, thereby allowing one to be able to simulate someone's mental state(s). Most neuroscientists and psychologists who defend the functional properties of MN embrace such an assumption. However, there are also those who express serious skepticism on the alleged functional properties attributed to MN. In this regard, neuroscientist Gregory Hickok's recent book entitled *The Myth of Mirror Neurons* is a paradigm example.

This presentation seeks to extend Hickok's skepticism on the functional properties of MN to issues involving empathy, intersubjectivity, and the second person perspective. In light of this, this paper attempts to show why the problems that beset MN are symptoms of a much bigger issue that involves the problem of an irreducible consciousness, for which neither appeal to a particular region in the brain nor to a nervous system as a whole seems to be capable of providing us with any satisfactory solution.

III.D: CWIS PANEL (CONT'D)

Wilden

103

Calling All Men!

Moderator: Faith Tucker

Panelists:

Leslie Wickman**Lynn Billman****Ken Touryan****Andrew Bocarsly**

There is more and more discussion about the lack of women working in the sciences, but is this issue relevant only to women? No!

Come hear from both men and women about why increasing the number of women working in science is just as much a man's issue.

In addition, learn about how you can support your female colleagues, students, wives, and daughters as they pursue their careers in science.

III.A: 75TH ANNIVERSARY OF THE ASA (CONT'D)

Munson

Chapel

Seventy-Five Years of Geology

Davis A. Young

We will review three major geological developments of the past 75 years: plate tectonics, planetary geology, and vertebrate paleontology. The assumption that continents and sea floors are stationary has yielded to abundant evidence for a dynamic planet on which continents migrate and sea floors spread while being carried passively on lithospheric plates that are powered by convection cells in the upper mantle. Directions and rates of plate movement have been spectacularly confirmed by contemporary GPS data.

Earth-based observation of planets and moons has been amplified by more than one hundred instrument-laden probes, orbiters, landers, and rovers delivered to all corners of the solar system. On-site observations have disclosed complex histories particularly for the surfaces of the Moon and Mars. Radiometric dating of lunar rocks and meteorites has shed light on the timing of events for much of the inner solar system. Evidence from radiometric dating paints a consistent picture for the extreme age of the planetary system.

Finally, recent dramatic vertebrate fossil discoveries include remains of primitive cetaceans that fill in details of the whale lineage; *Tiktaalik*, a transitional form between fish and amphibian; and more than forty species of feathered dinosaurs from China. These finds provide further compelling paleontological support for an evolutionary view of the history of terrestrial life.

III.B: TEACHING SCIENCE AND FAITH (CONT'D)

Wilden

111 (Wyant)

Christian Apologetics and Science: Is Faith Intellectually Dishonest?

M. P. Worth McEwan

In light of modern science, outspoken atheists like Richard Dawkins accuse Christianity of being dishonest: self-criticism regarding our ideas and beliefs is integral to scientific progress, but religion appears to replace this with uncritical adherence to revealed truths.

Drawing on Thomas F. Torrance's "modalities of reason" for different objects of inquiry, this brief talk argues that we may be intellectually honest toward both God and scientific inquiry: science self-critically attends to the physical world, and theology self-critically attends to the divine Word—neither gets anywhere when it becomes skeptical about the existence of its own object.

The theologian who becomes unsure of the existence of God is like a scientist unsure of physical reality: the only "proof" is to experience and live in the presence of a given reality (God, other persons, physical objects), coming to know it on its own terms.

Some important apologetics and science-and-religion implications follow: Dawkins makes the error of scientism by thinking that all inquiry must be subordinated to just one inquiry: investigation of physical reality; however, it is also erroneous to think that science must be subordinated to theology and biblical interpretation—which is the inquiry into the "object" of God's entire speech-act toward humanity.

Most importantly, Christian faith is no more dishonest about God than science is dishonest about the existence of the universe. Each simply finds itself encountered by its "object" and is self-critical *in view of that object*.

III.C: MIND SCIENCES (CONT'D)

Wilden

102

Perseverance: Psychospiritual and Genetic Perspectives

Tony Jelsma, Arielle Johnston, and Bruce Vermeer

Perseverance constitutes a quality that motivates humankind to press onward—usually in the face of significant adversity and resistance. Perseverance is also important in the Christian life. The apostle Paul, using athletic training metaphors, frequently urges his readers to persevere in the faith, even describing his own life as a fight and a race (2 Tim.4:7). Yet, certain groups of people seem to possess a greater measure of perseverance than others have. We are therefore led to ask, "Can our ability to persevere be, in God's providence, at least partly genetically influenced?"

In our biology undergraduate senior research projects, we have been comparing the distribution of various gene alleles with physical and psychological traits. In one study, we found that our college athletes had a significantly different allele distribution pattern of the ACE (angiotensin-converting enzyme) gene than non-athletes. Among other actions, ACE regulates the levels of aldosterone, which acts in the kidney in sodium regulation but also in the brain. Studies in mice and humans suggest a role for the aldosterone receptor NR3C2 in the response to stress. Suspecting that success in athletics may require both increased perseverance and physical ability, we are comparing the distribution of 2 alleles of the NR3C2 gene with the trait of perseverance in college students.

While acknowledging that perseverance in faith may be a different quality than in other life activities, we feel the integration of our genetic endowment with a spiritual discipline can have profound implications for our understanding of God's providence.

III.D: CWIS PANEL (CONT'D)

Wilden

103

Ask Not What Your Students Can Do for You ...

Moderator: Faith Tucker

Panelist:

Hannah Eagleson

Ask not what your students can do for you ... but what you can do for your students. Today's students will be tomorrow's PIs, professors, and project managers. But it is a long road from the undergraduate classroom to an established career in the sciences.

In this session, we will hear from current students and early career scientists about the challenges and questions they face.

We will consider how ASA as an organization and we as individuals in our unique professional roles can support and encourage the next generation of Christians in the sciences.

III.A: 75TH ANNIVERSARY OF THE ASA (CONT'D)

Munson

Chapel

ASA Does Not Take an Official Position on Controversial Questions

Terry M. Gray

Richard H. Bube wrote in 1971 in the *Journal of the American Scientific Affiliation (JASA)* that “ASA does not take an official position on controversial questions.” He argued that “creation” as a theological topic was not controversial but that fiat creationism (now young-earth creationism [YEC] or biological evolution or old-earth geology/cosmology (as scientific theories) were controversial questions for which ASA had no official position.

When Bube became editor of *JASA* in 1969, he defended Paul H. Seely’s “The Three-Storeyed Universe.” Combatting criticisms inside and outside the ASA, Bube wrote, “It is not the function of the journal to propagate a crusade for any particular interpretation ...” Bube extended controversial questions to the definition of biblical inerrancy and to particular interpretations of scripture.

F. Alton Everest’s 1951 survey of the first ten years of the ASA shows that this attitude was part of the ASA’s DNA from nearly the beginning, as does Delbert H. Eggenberger’s 1956 editorial. ASA has resisted efforts to become a group advocating a particular position leaving such advocacy to others: YEC (Creation Research Society), old-earth creationism (Reasons to Believe), intelligent design (Discovery Institute), or evolutionary creation (BioLogos Foundation). More recently, the “no official position” viewpoint received some nuance with Randy Isaac’s tenure as Executive Director and his interaction with YEC, ID, and climate science.

The “no official position” perspective in the ASA is evident on issues other than origins. This presentation will conclude with some reflections on the pros and cons of this perspective.

III.B: TEACHING SCIENCE AND FAITH (CONT'D)

Wilden

111 (Wyant)

Creation Pacifism: A Unifying Response to the Creation War?

S. Joshua Swamidass

I propose “Creation Pacifism,” a movement to choose peace in the Creation War, even among Christians who reject evolution, because Jesus is greater than anything we find in science, no human effort can hold him, and he does not need our defense.

For more than a century, a great creation war has grown between many Christians and scientists. Consequently, Christian engagement with the sciences has focused on scientific arguments against evolution. Even if evolution is false, anti-evolutionism did not convince scientists to abandon evolution; during the Dover Trial in 2005, it led us into war.

On the other hand, most paths to peace in the creation war (e.g., evolutionary creation) require that Christians accept evolution as God’s way of creating us. Even if evolution is true, most Christians will not accept it anytime soon. We need a better path to peace, and I propose that creation pacifism could be this path.

From my experience as a science professor at a leading secular university, I want to share how this idea is being received among my colleagues and students, both Christians and secular.

III.C: MIND SCIENCES (CONT'D)

Wilden

102

Carbon Nanotechnology, Neuronal Interfaces, and Self-perception

William K. A. Sikkema and James M. Tour

Carbon nanomaterials hold many potential applications for the medical field due to their unique structure, reactivity, and conductivity. Many of these applications cannot be realized by current applications of small molecules or enzymes. I will discuss our lab’s development of three carbon based nanomaterials that interface with the brain.

The first are single-wall carbon nanotube derived antioxidants. These have wide application in the medical field as antioxidants (for rheumatoid arthritis, multiple sclerosis, stroke, heart attack, and traumatic brain injury), but they also allow efficient chemotherapeutic drug delivery through the blood-brain barrier against glioblastoma, a type of brain cancer.

The second is a nanophotonic retinal prosthesis made from flexible, porous silicon and a graphene/nanotube hybrid. This stand-alone intraocular device promises to allow people with certain types of blindness to see in high resolution by stimulating the inner retina on a cellular level, compared to the currently available 60-pixel device which only stimulates on the tissue level and requires an external camera.

The third are water-soluble graphene nanoribbons designed to be electrically conductive and biocompatible for spinal cord reconnection following complete or partial severance, in the context of a head transplant and, more generally, spinal cord injury.

I will discuss these carbon nanomaterials with reference to the conference theme—brain, mind, faith—especially with regard to self-perception: how one reflects upon oneself in a journey through brain cancer, visually seeing oneself for the first time, and waking up after surgery to find a new body attached to one’s head.

III.D: CWIS PANEL (CONT'D)

Wilden

103

No scheduled talk.

IV.A: ASA VIP SYMPOSIUM

Munson

Chapel

Reflections and Insights Shared by ASA VIPs

Moderator: Randy Isaac

ASA VIPs:

John Wood
Harold Stephens
Martin Price

Each VIP will give a short response to two series of questions. The first includes

- What were you doing when you joined ASA?
- How did you hear about the ASA?
- Why did you join?
- What impact has ASA had on your life?

The second series is

- What was ASA like when you joined?
- How has ASA changed since you joined?
- How do you think it needs to change in the future?

IV.B: TEACHING SCIENCE AND FAITH

Wilden

111 (Wyant)

**BioLogos
 Public Engagement on
 Evolution and Christianity**
Deborah Haarsma

Recent research gives new insights into how people think and feel about evolution, showing that rejection of evolutionary science is usually tied to a person's church community and views of the Bible.

In this context, how does BioLogos present evolutionary creation as a faithful option for Christians?

We are working to build trusted lines of communication with many Christian groups, address biblical and theological concerns, present the scientific evidence found in God's creation, and equip scientists, teachers, and pastors to transform the conversation on science and biblical faith.

Come for an overview of current BioLogos programs and recent impacts.

IV.C: MIND SCIENCES

Wilden

102

**What Is a Person?
 Thomas Nagel's Case
 against Materialism**
Peter Payne

Thomas Nagel, the highly respected philosopher of mind (an atheist), in 2012, came out with a book entitled *Mind and Cosmos: Why the Materialist Neo-Darwinian Conception of Nature Is Almost Certainly False* (Oxford University Press).

Not surprisingly it created quite a stir because, for many atheists, a central underpinning for their atheism is the conviction that materialism/naturalism is almost certainly true.

Nagel is not antievolution, nor does he think that there is anything beyond the natural world, but he does lay out a case for believing that the nature cannot be purely physical. The problem? Mind! Indeed anything related to persons as conscious agents!

Nagel's critique focuses on reductive naturalism, but this presentation will argue that the nonreductive naturalism of someone such as philosopher John Searle also fails.

The talk will end with a brief critique of Nagel's proposal, "natural teleology."

IV.D: PHYSICAL SCIENCE

Wilden

103

**What Does Quantum
 Physics Tell Us about
 Nature, Mind, psi and
 Divine Action?**

**Stanley Klein and
 Christopher Cochran**

Quantum mechanics (QM) together with quantum electrodynamics (QED) give the simple rules governing electrons, protons, and photons. These rules provide an excellent grounding for how biology can be emergent from physics, followed by brains being emergent from biology. Beyond this, there is still much to be explained.

Our presentation explores the controversies about what is unexplained by known science, including (1) mind and subjectivity (*qualia*), (2) psychic phenomena (psi), and (3) divine action (God). Our presentation begins with the controversies regarding the metaphysical underpinnings of QM/QED. Then we move to questions about how QM/QED may need to be modified to encompass *qualia*, psi and God.

Part 1. Chris Cochran and I have been studying the top fifteen empirically equivalent interpretations of quantum mechanics. These interpretations supply different ontologies. We think this is good sign for science-religion dialogue. For example, some interpretations include a mental agency in a manner that could be open to divine action. Other interpretations have no such agency. However, since all of the interpretations predict the same outcome, there is something correct about all of them. That is strong encouragement for humility.

Part 2. We will point out that some interpretations of QM provide a framework for *qualia*, psi, and God to be real. It is likely that modifications to the Born Rule of QM and/or to the standard model would be needed to account for some of the (psi) data. Our talk will focus on the needed modifications.

IV.A: ASA VIP SYMPOSIUM (CONT'D)

Munson Chapel

Reflections and Insights Shared by ASA VIPs

Moderator: Randy Isaac

ASA VIPs:

Walt Hearn
Jack Swearingen
Ken Olson

Each VIP will give a short response to two series of questions. The first includes

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- Why did you join?
- What impact has ASA had on your life?

The second series is

- What was ASA like when you joined?
- How has ASA changed since you joined?
- How do you think it needs to change in the future

IV.B: TEACHING SCIENCE AND FAITH (CONT'D)

Wilden 111 (Wyant)

The Process of Implementation of the Brazilian Association of Christians in Science

Roberto Covolan, Guilherme de Carvalho, Jonathan Freitas

Currently, a three-year project aiming to create the Brazilian Association of Christians in Science, with the mission of bridging the scientific milieu and the Christian community in Brazil, is under development.

The project (sponsored by the Templeton World Charity Foundation) comprises three interconnected initiatives: (1) *Networking*: strategic visits to people and institutions of the main Brazilian cities and a series of public events planned to reach a wider audience and especially Christians interested in science; (2) *Engagement*: engaging activities designed to assemble, network, and empower people both in science and in ministry, aiming at establishing leaders for the association's local groups; (3) *Content*: editorial and media initiatives designed to bring high-quality information to specialized and general public.

The networking initiative is finding and connecting Christians who are scientists, Christian scholars with scientific interests, and religious leaders with scientific concern. The engagement effort is producing courses on science and religion, composed of basic and advanced seminars and an internet learning program. These activities are accompanied by the concomitant production of academic and pastoral content with the potential to enhance communication between the scientific and the Christian evangelical realm and properly advance the science-and-religion research field in Brazil.

An overview will be presented of the project's accomplishments and main challenges during its first year of implementation.

IV.C: MIND SCIENCES (CONT'D)

Wilden 102

Computational Neuroscience and Neuroplasticity: Implications for Christian Belief

Daniel Dorman

Computational neuroscience is a broad and diverse field of study, encompassing everything from modeling intracellular biochemical reactions to simulating cognitive processes such as decision making. It raises significant questions concerning the nature of the relationship of the brain and mind and proposes to explain how mental processes are related to brain functions. For Christians, it raises important questions about human nature and the soul.

Several assumptions are at work in the field of computational neuroscience. In one aspect, the goals of computational neuroscience to model neurobiological processes are similar to computational modeling in other fields, in which the model simulation is ontologically distinct from the phenomenon of interest. However, computational neuroscience offers an additional, radically different aspect when it assumes that mental functions are essentially computations performed by the brain, and that a successful computational simulation could actually produce the phenomenon of interest—a mind-like intelligence.

My presentation will survey the current state of the field of computational neuroscience, including the philosophical questions it raises and the challenges it faces in attempts to understand the brain-mind relationship.

In additional, I will discuss my own research as a PhD student in computational modelling of cellular and synaptic neuroplasticity and explore how the scientific paradigms in my research challenge a simplistic, reductionist approach to the mind-brain problem.

IV.D: PHYSICAL SCIENCE (CONT'D)

Wilden 103

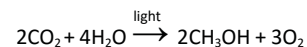
Correcting Our Behavior: Anthropomorphic Atmospheric CO₂, a Defilement of the Land

Andrew B. Bocarsly

"And I brought you into a plentiful land to enjoy its fruits and its good things. But when you came in, you defiled my land and made my heritage an abomination" (Jer. 2:7).

Although the above verse was written to the Israelites and specifically speaks of the land of Canaan and Israel's spiritual state, it seems to reflect the general state of people's heart regarding environmental actions. Often we "get away with defiling the land" because our infractions are small compared to the self-repairing nature of the creation. However, it seems that previous minor infractions have led us to the false conclusion that our actions are too small to impact nature.

Instead of continuing with this thinking, it may be time to turn our resources and intellect to the development of approaches that can stop future degradation of the environment. This is a major goal of our research program at Princeton University on CO₂ utilization, in which chemistry is being developed to convert CO₂ and water to useful organic products. Though the transformations of interest are thermodynamically uphill and thus, require an energy input, we have developed new catalysts that minimize the energy required, thereby allowing schemes that utilize solar energy as the input. For example, aqueous carbon dioxide can be photoelectrochemically converted to methanol with high efficiency using this chemistry:



Methanol has applications both as a fuel and as a starting material for a variety of useful compounds including polymers used in building materials.

This talk will explore chemistry that can potentially undo the climate change habits that we as a society have developed, producing valuable organic feedstocks and fuels.

**IV.A: ASA VIP
SYMPOSIUM
(CONT'D)**
Munson Chapel
**Reflections and Insights
Shared by ASA VIPs**

 Moderator: **Randy Isaac**

ASA VIPs:

**Ken Touryan
Leland Williams
Phil Ogden**

Each VIP will give a short re-
sponse to two series of questions.
The first includes

- What were you doing when you joined ASA?
- How did you hear about the ASA?
- Why did you join?
- What impact has ASA had on your life?

The second series is

- What was ASA like when you joined?
- How has ASA changed since you joined?
- How do you think it needs to change in the future

**IV.B: TEACHING SCIENCE
AND FAITH (CONT'D)**
Wilden 111 (Wyant)
**Science and the Next
Generation of Religious
Leaders: The AAAS Science
for Seminaries Project**
David Buller and Walter Rogero

In 2014 the AAAS Dialogue on Science, Ethics, and Religion (DoSER) program launched the Science for Seminaries project, a three-year effort working with seminaries to integrate science into their training of future religious leaders. An outworking of the AAAS mission of "advancing science, serving society," this project seeks to encourage the development of future religious leaders for effective leadership on topics relating to science within their communities.

Our ten grant-supported pilot seminaries represent a broad range of evangelical, mainline, and Catholic traditions, and project faculty at these institutions are identifying novel and fruitful ways to engage with science. Rather than creating separate electives, project faculty are integrating various sciences into a broad range of pre-existing core courses, including systematic theology, biblical studies, church history, ethics, and more.

Complementing these curricular revisions, the seminaries are conducting campus-wide events on science and reaching out to their constituents and communities on the relevance of scientific engagement. AAAS is supporting these efforts through networking with local scientists and faculty mentors, providing science resources, and hosting faculty retreats this summer to disseminate the fruits of the pilot seminary projects.

This presentation will summarize the Science for Seminaries project and the work of our partner seminaries, highlight lessons learned and best practices, and present key resources DoSER is producing (such as a science video series) to facilitate engagement with science among theological educators.

**IV.C: MIND SCIENCES
(CONT'D)**
Wilden 102
**Many Members, One Body:
Implications of Current
Practices in Culturally
Responsive Psychometric
Assessment in Schools**
Susan Billman

The topic of assessment for culturally and linguistically diverse learners is mired in controversy and politics. How much can traditional methods of cognitive, adaptive, and social emotional assessment predict the needs of youth from non-Western cultures? What we know about the development of diverse learners and our calling to ethical practice implores us to explore more deeply and find creative solutions.

In this session, best practices in assessment and observations from the field will be discussed. First, recommendations from national organizations and a review of current research will be presented, followed by a discussion of real-world challenges with the assessment of multicultural and multilingual students in a school setting. Finally, the session will conclude with a theological argument for the development and responsible use of more culturally sensitive psychometric tests.

**IV.D: PHYSICAL
SCIENCE (CONT'D)**
Wilden 103

No scheduled talk.

V.B: MIND SCIENCES

Munson

Chapel

Cultural Psychology: Why Can't We All Just Get Along?

Kevin S. Seybold

It is often noted that America is becoming more and more polarized on political, social, and even religious issues. Why do self-identified conservatives typically take a pro-life, pro-death penalty, anti-gun control stance while self-identified liberals generally take opposing positions on these issues? Why do conservatives generally tend to be skeptics about climate change and question the legitimacy of evolutionary theory while liberals tend to be more open to climate science and evolution? There seems to be accepted "conservative" and "liberal" views on various issues that have little in common (e.g., gun control and climate change).

This presentation will discuss the literature in psychology dealing with decision theory, information processing, dual-processing theory, and others that relate to why people make the decisions and assume the opinions they do. These same psychological processes can also be used to help understand why "conservative" and "liberal" Christians who read the same Bible can come to such divergent views on gay marriage, abortion, care for the environment, immigration, etc.

Given what we know about decision making and information processing, how might Christians (and people of other religions or of no religion at all) become less polarized and more willing to work with others who have dissimilar viewpoints? What are some of the findings from psychology that can be implemented to help people reach consensus on the important issues of the day, in the church and out of it?

V.A: TEACHING SCIENCE AND FAITH

Wilden

111 (Wyant)

Nothing in Christianity Makes Sense Except in the Light of EvolutionEmily Ruppel and
Edgar Paul Herrington IV

Death and struggle, the invisible violence underlying all organic beauty, figure prominently in Charles Darwin's first articulation of evolutionary theory. A thoughtful and sensitive man, Darwin shouldered deep anxiety positing natural selection as the mechanism for speciation in which breathtaking diversity emerges from the wreckage of differential survival.

One hundred fifty years later, the outwardly neutral term "competition" still characterizes our understanding of basic biological processes. Essayist and amateur ecologist Annie Dillard described nature as "profligate," a "spend-thrift with limitless capital." Many Christians who reject evolution claim that "God would not choose such a process."

Just as serenity eludes the sympathetic observer of wildlife, the biblical narrative of sacrificial crucifixion vexes some would-be believers attempting to reconcile the God of love and mercy with the God who requires Jesus's brutal punishment and humiliation.

While many evolutionary creationists point to extravagant beauty and the productive aspects of evolution as pointers to divine creative action and God's unfathomable wisdom, exchanging a focus on creation and evolution for a focus on theodicy and evolution can highlight important and, we think, productive resonances between the unavoidable fact of suffering in nature and the Christian belief in a suffering God.

V.C: APPROPRIATE TECHNOLOGY

Wilden

102

A Case for Innovation TheologyLanny Vincent and
Jack Swearingen

Does God have anything to do with innovation? Does innovation have anything to do with God?

How we answer these questions reveals our innovation theology. **Whether** we seek answers to such questions in the first place reveals much about our orientation to change and readiness to respond.

Innovation theology is how we think and make choices at the intersection of discovery (science), invention and reductions-to-practice (engineering), value (economics, sociology and psychology) and the living Will of God (theological inquiry). Whatever stirs in our imaginations where innovation and theology intersect, the intersection warrants our attention, if only to discern where God's intentions are with respect to change and how we choose to respond.

Is God breathing in the new value we aim to create for others? If so, then we are likely to

- make meaning before money;
- counter the tyranny of bottom lines with guidance of plumb lines;
- make sense of change that doesn't otherwise make any;
- reattach extrinsic to intrinsic value.

Not to be confused with workplace spirituality or business ethics, innovation theology could be a field that ASA might steward—not only to widen its own reach, but to encourage scientists, engineers and entrepreneurs to bring technological innovations to the common good instead of just in response to the invisible hand of the market. In particular the authors believe that this concept could provide a new platform for Christian Engineers in Science and Technology (CEST). We invite interested persons to join us in the conversation.

V.D: STUDENTS/EARLY CAREER WITH EMERGING SCHOLARS NETWORK (ESN)

Wilden

103

Growing Spiritually through Your Work in ScienceHannah Eagleson, organizer;
Tom Grosh, moderator

Panelists:

Dave Vosburg

Francis Su

Deb Haarsma

- Does a day in the lab or at your computer feel distant from the way you grow spiritually?
- Are you puzzled as to how what you do all day relates to what you believe?
- Or do you find that doing science helps you flourish in your faith?

Whatever your experience, come hear our panelists talk about how science and spiritual growth fit together.

Presenters include Dave Vosburg, chemistry professor and Urbana 15 speaker; Francis Su, professor and President of the Mathematical Association of America; and Deborah Haarsma, astrophysicist and BioLogos president.

**V.A: MIND SCIENCES
(CONT'D)**

Munson

Chapel

Anxiety, Fear, and Walking after the Spirit: Is Neurology Making the Bible Irrelevant or Can Neurology Have a Positive Impact on our Christian Lives?

Paul Shrier, Cahleen Shrier, and Daniel Gillooley

Daniel Kahneman's widely read work on System 1 and System 2 decision making raises important questions about how we make choices. Joseph LeDoux, in his book *Anxious*, separates emotions from feelings. He uses the term "emotions" to describe unconscious reactions to conditioned stimuli based upon our brain architecture, brain function, and past experiences; feelings occur when emotional reactions bubble up into our consciousness.

Cahleen Shrier, professor of biology at Azusa Pacific University, will provide us with the neurobiology of anxiety. Paul Shrier, professor of practical theology, and Daniel Gillooley, graduate theology student, both at Azusa Pacific University, will present an exegetical analysis of Romans 7–8.

Cahleen, Paul, and Daniel will then compare, contrast, and synthesize their work from these separate disciplines. We will then use the tools of contextual theology to answer the following questions: How do we understand "the flesh" in light of anxiety processes? How does the term "walk after" relate to the conscious and unconscious activities of positive and negative reinforcement, conditioned responses, extinction, reconsolidation, anxiety-creating and anxiety-alleviating processes? Do we have free choice, and if so, is it bounded? In light of our comparisons, is this passage of scripture validating or invalidating for our understanding of the relevance of scripture in an age of rapid neurological scientific progress? Finally, can we use what we discover to "walk after the Spirit" more effectively, and if so, how?

V.C: TEACHING SCIENCE AND FAITH (CONT'D)

Wilden

111 (Wyant)

Progress and Pitfalls in Crafting an Educational Philosophy Statement on Origins

Bryan Isaac

Bethel College recently went through campus-wide and constituent-wide discussions of issues related to science and faith, culminating in the college's Educational Philosophy Statement on Origins.

This talk will cover the factors that led the college to undertake such broad discussions, the process on campus and beyond, the involvement and reciprocal influence of college and denominational leaders and pastors, the impact of such a statement for the college and its constituents, and the resulting state of science-and-faith discussions on campus.

The presenter was involved in a majority of the meetings, so there will be additional comments on the challenges and breakthroughs encountered throughout the multiyear effort.

V.B: APPROPRIATE TECHNOLOGY (CONT'D)

Wilden

102

The Nature of Christian Engineering
William Jordan

Within ASA there have been many presentations that have attempted to relate Christian faith to the practice of engineering. There have been papers relating Christian faith to humanitarian engineering and Christian faith to entrepreneurial engineering. This looks at a more fundamental issue of whether there is such a thing as Christian engineering.

We will look at several issues. The first one is the nature of engineering. One's definition of engineering affects how that person sees the best ways to practice it.

The second issue we will examine is differing Christian perspectives on culture. We will use insights gained from Richard Niebuhr's insightful book *Christ and Culture*. Someone's view of culture will affect the way they practice engineering.

The third area we will examine is what the Bible has to say about technology and society. Included in this will be a discussion about the cultural mandate and what it means for Christians practicing engineering.

Our final point will be a development of the concept of Christian engineering. It is much more than just engineers who also happen to be Christians. If Christian engineering is important, then we need to discuss what sort of societies and publications should be created that will help support this work.

While involvement with ASA continues to be very valuable for engineers, a Christian engineering specific group can attract the involvement of additional engineers.

V.D: STUDENTS/EARLY CAREER WITH EMERGING SCHOLARS NETWORK (ESN)

Wilden

103

Finding Christian Mentors/Community in Science

Hannah Eagleson, organizer; Sharon Carlson, moderator

Panelists:

Faith Tucker

Randy Isaac

Johnny Lin

Terry Morrison

Sometimes it's tough to find mentors and friends in your field at all, let alone ones who share your faith. We've gathered a group of scientists with experience in industry, education, and campus ministry to offer tips on finding community with peers and mentors.

Speakers include Faith Tucker, an educator and previous NASA curriculum developer, and a Christian Women in Science (CWIS) board member; Randy Isaac, an executive director emeritus of ASA and previously an IBM vice president; Johnny Lin, an ASA council member with experience in industry and academia, as well as occasional webcomic writing; and Terry Morrison, a longtime ASA member and emeritus director of InterVarsity's Faculty Ministry.

Panelists will share advice on finding mentors and building community in different settings.

**V.A: MIND SCIENCES
(CONT'D)**

Munson Chapel

**Extended Mind and
Extended Religiousness: An
Alternative to the Cognitive
Science of Religion**Brad D. Strawn and
Warren S. Brown

The cognitive science of religion presumes that religiousness is natural. The naturalness is understood as due to either nature (as in evolutionary psychology and genetics) or nurture (as in learning theory, very early childhood experiences, etc.). Either way, religiousness proceeds from inside out. Religious traditions are the outgrowth of early childhood attributions of animate properties to inanimate objects, or divine causes to chance events. Behind these ideas and theories is the presupposition that religiousness is primarily an individual human attribute. It is individual human persons who are religious. Religious rites, rituals, and practices are merely aggregations of individual religiousness.

This presentation explores the implications of embodied and extended cognition as an alternative to the cognitive science of religion. Embodied and extended cognition are critical elements in current theories within philosophy of mind. In this view, by virtue of the structure and functions of the brain, humans bring to life very basic cognitive skills—memory, language, consciousness, imagery, imitation, etc. When humans encounter the world—particularly the social world—their capacities become enmeshed in larger cognitive networks. What arises from interactivity in such interpersonal networks is not attributable to the capacities of any particular individual. Cognition is supersized in ways well beyond anything realizable in a single individual. Thus, religiousness exists primarily in extra-individual space (although we carry around memories of these interactions). This presentation will explore the added richness of extended cognition as it impacts our understanding of human religiousness, and more specifically our understanding of Christian life.

**V.C: TEACHING SCIENCE
AND FAITH (CONT'D)**

Wilden 111 (Wyant)

**Exploring Belief through
Science and Religion**
Fraser Fleming

A study-abroad course “The History of Science and the Influence of Religion” was developed with invitational opportunities for students to transition from passively evaluating science and religion as a topic to personally engaging with the pertinent worldview issues. The course employed a chronological development, following the evolution of the universe from cosmology through biology to neuroscience. The chronological approach allowed for discussions with seemingly impersonal ideas before tackling more personal issues such as what constitutes human nature and the origin of mind/soul. Students were provided with opportunities to explore their own views through personal reflection, assignments, presentations, group discussion, and journaling.

The main content was taught through guided inquiry. Four 2-hour sessions employed a lecture, video, discussion format to introduce topics covered in greater detail through three book readings. Individual readings prepared students for an assignment that required a higher-level synthesis of major themes in science and religion. For example, the first essay assignment asked why the early beginnings of modern science started in Italy but moved to northern Europe.

The guided inquiry primed students for two weeks studying abroad, beginning in Rome (Roman Forum, Vatican, Vatican Observatory), progressing through Florence (Galileo Museum), Munich (anthropology and science museums), Stuttgart (Kepler Museum), Burn (Einstein Museum), and concluding in Geneva (CERN). Visiting museums, religious sites, and exhibits brought to life the way in which scientific discoveries have been colored by culture, religion, and the personal views of scientists.

**V.B: APPROPRIATE
TECHNOLOGY
(CONT'D)**

Wilden 102

**Catalysis of the Human
Spirit to Transform Others
in Great Need: How Being
a Project Manager in the
Petroleum Industry Led to
Amazing Results**

C. Ray Carlson

My 20-year career in the petroleum refining industry, and my commitment to seek the Lord's will for my life, led to some amazing results. I started in the pilot plants of UOP, the foremost R&D company in the oil refining industry. My first job was to oversee experiments with platinum-based catalysts for the transformation of naphtha from crude oil to high octane gasoline. Eventually, I became project design manager of Scandinavia's largest oil refinery. I had to write business plans that convinced the all-Swedish management that the refinery would be profitable.

Back in the States, with help from my business-savvy Rotary Club members, I started teaching middle school students how to write business plans based on their own ideas. Entrepreneurs are needed to create jobs. My initial focus was on black youth because of their high unemployment rate. They need a Plan B. Make their own jobs.

Now we are sending business-savvy teams from California to Nigeria, to train an average of 2,000 university students in each state; 11,000 have been trained to date. With population expected to double by 2050, double the current number of jobs must be created.

Long-term surveys in Sweden indicate that entrepreneurship education in high school creates 24 percent entrepreneurs, who hire on average four others.

Project Management is the key to most of the great needs of the world. Many at this conference are likely project managers of one kind or another. Their skill sets and experience can be directed to innovation that resolves great needs.

**V.D: STUDENTS/EARLY
CAREER WITH EMERGING
SCHOLARS NETWORK (ESN)**

Wilden 103

**Thriving As a Science
Student (Graduate or
Undergraduate)**Hannah Eagleson, organizer;
Dwight Schwartz, moderator

Panelists:

Dorothy Boorse
Deb Haarsma
Josh Swamidass

Grad or undergrad, Christian college or secular university, our panelists have ideas to help you thrive.

Speakers will share ideas based on their experience in a range of scientific fields including astrophysics, wetlands ecology, and computational approaches to medical research; plus teaching and research experience in secular and Christian colleges/universities.

Panelists include Dorothy Boorse, professor of biology at Gordon College and coauthor of *Environmental Science: Toward a Sustainable Future* (Pearson, latest edition 2016); Deborah Haarsma, astrophysicist and BioLogos president and previously professor in the physics and astronomy department at Calvin College; and S. Joshua Swamidass, professor in the laboratory and genomic medicine division at Washington University in St Louis, and a Veritas Forum and Urbana 15 speaker.

**V.A: MIND SCIENCES
(CONT'D)****Munson****Chapel**

No scheduled talk.

**V.C: TEACHING SCIENCE
AND FAITH (CONT'D)****Wilden****111 (Wyant)**

No scheduled talk.

**V.B: APPROPRIATE
TECHNOLOGY
(CONT'D)****Wilden****102**

No scheduled talk.

**V.D: STUDENTS/EARLY
CAREER WITH EMERGING
SCHOLARS NETWORK (ESN)****Wilden****103****Talking to Secular
Colleagues about Faith****Hannah Eagleson**, organizer;
Emily Ruppel, moderator

Panelists:

Dave Vosburg**Jennifer Wiseman****Josh Swamidass**

- Is it ever hard to articulate your faith to secular colleagues?
- Do you wonder how to respond to tough questions?
- Or how to start a meaningful conversation about beliefs?

This group of Christians who have served with NASA, secular universities, and more share their thoughts.

Speakers include Dave Vosburg, chemistry professor at Harvey Mudd College and Urbana 15 speaker; Jennifer Wiseman, senior project scientist for NASA's Hubble Space Telescope and program director for AAAS's Dialogue on Science, Ethics, and Religion (DoSER); and S. Joshua Swamidass, professor in the laboratory and genomic medicine division at Washington University in St Louis, and a Veritas Forum and Urbana 15 speaker.

VI.A: TEACHING SCIENCE AND FAITH

Munson

Chapel

Benefits of Diversity in a Congregation

Bill Roundy

There is so much diversity in creation: in the geography and the many forms of life on our planet, in the Milky Way, and in the rest of the universe. There is much diversity among people in their understanding of science and their understanding of the Bible. Most of these differences exist among followers of Jesus as they do among other Americans.

Our English Bibles are translated from a few ancient near eastern languages and culture(s). Our various understandings of the English texts result in different views of creation. There are benefits to having friends in the congregation who have different views from our own.

It has been said that congregations with common ethnicity, social group, and/or education are likely to grow more rapidly. What benefits might there be for less uniform congregations? Galatians 3:28 indicates that huge diversity in a congregation should not be a hindrance.

- How might diversity in a congregation help remove some barriers to others becoming followers of Jesus?
- How might diversity in a congregation be helpful to new followers of Jesus because they would not feel so very different from everyone else?
- In what ways might diversity minimize youth leaving a congregation because of truths they have learned in school or in college?
- Do congregations sometimes die because of a lack of diversity?
- What is necessary for the diversity of a congregation to result in these benefits?
- How can a congregation realize the benefits of being diverse?

Because each of us trusts God, we should recognize, respect, and appreciate our differences.

VI.B: LIFE AND ENVIRONMENTAL SCIENCES

Wilden

102

Is There a Biochemical Anthropic Principle?

Fazale "Fuz" Rana

The anthropic principle stands as one of the most provocative discoveries in astrophysics.

Growing interest in astrobiology has inspired questions of whether or not the anthropic principle applies to biochemistry. Life scientists are asking, "Why are terrestrial biochemical systems the way they are?" and "Are there alternate biochemistries?"

Based on these queries, a strong case can be made that biochemical systems are specified by the laws of nature and, consequently, may well be universal systems. To put it another way, there doesn't appear to be alternate biochemistries. Eerily, terrestrial biochemical systems appear to possess properties that make them uniquely and ideally fit for life.

In this presentation, I will use the central dogma of molecular biology and the fitness of protein structure as two interrelated examples to make the case for the biochemical anthropic principle. I will present evidence that the central dogma of molecular biology is not the product of a contingent evolutionary history, but instead reflects a deeper, underlying molecular logic demanded by the laws of nature. In like manner, I will demonstrate that the standard set of amino acids used to build proteins are optimal; and that secondary, supersecondary, tertiary, and quaternary structures are, too, dictated by the laws of physics and chemistry. This hierarchy of structures is uniquely fit to support life.

I will conclude by discussing the scientific, philosophical, and theological implications of the biochemical anthropic principle.

VI.C: MENTORING SYMPOSIUM

Wilden

103

Mentoring: Beyond the Buzzword Part 1: A Framework for Mentoring

Sharon Carlson

The term "mentoring" is a buzzword in today's culture, but in practice remains vague and undefined. This three-part symposium will provide a realistic and effective framework for mentoring in both professional relationships and personal growth. It will also include practical resources for building mentoring relationships for ASA members and students.

In this session, I will define what mentoring is, and isn't, to help participants understand how a constellation model of mentoring relationships can be effective professionally and personally.

Participants will gain an understanding of the various types and functions of mentoring and consider how mentoring can be both practiced and received through daily interactions, work, and friendships.

VI.A: TEACHING SCIENCE AND FAITH (CONT'D)

Munson

Chapel

Explaining Science within the Context of Faith: Lessons Learned from the Field of Citizen Science

Dana Oleskiewicz

Science education is forever challenged, more so now given the ever-increasing misinformation available on the internet and in light of the Genesis controversy giving rise to anti-science sentiment. The essence of performing science is often misunderstood, as are its conclusions.

On the important topic of our origins, communicating complex science ideas within the context of faith has become essential in maintaining harmony between what we know and how we seek the Lord. Accurate portrayals of the scientific method, hypothesis, theory, and law, as well as the limits of science must have a firm footing within our Christian education, homeschool curriculum, churches, seminaries, and homes.

Citizen science is a tool used to engage our communities in the scientific process through collaborative study design, data collection, determining conclusions, and participatory decision making toward a common goal. As gracious dialogue continues to explore young-earth creationism, old-earth creationism, and evolutionary creationism, the lessons we learn from the tool of citizen science can be applied to our efforts in finding balance between our analytical scientific minds, loyalty to an authoritative scripture, and a faith in God.

VI.B: LIFE AND ENVIRONMENTAL SCIENCES (CONT'D)

Wilden

102

Living Wisely in an Era of Gene Editing at Will

Anjeanette "AJ" Roberts

Widespread access to CRISPR/Cas9 technology and its relative simplicity means virtually any scientist can perform almost any gene editing experiment they choose. The implications of precisely altering genetic sequences in living cells at will are profound. Potential for correcting genetic disorders and diseases is exciting, but what consequences might follow development of tools of molecular eugenics?

By tweaking protein binding sites and guide RNAs, scientists are transforming crude CRISPR/Cas9 tools with low efficiency and high off-target hits into precision instruments. Fine-tuning the system and our skills is not the only challenge that must be overcome to use CRISPR/Cas9 effectively, efficiently, and safely.

Ten percent of the human genome is still inaccessible or unanalyzed by current genomic sequencing and analysis techniques. Many of these sequences are highly repetitive and/or bound tightly in heterochromatin. They are thought to be unimportant, but other studies show this assessment is premature. In light of off-target gene editing, every new report of associated function in sequences previously thought to be irrelevant should raise red flags for the use of CRISPR/Cas9 in human cells and attest that our confidence in understanding the human genome may be perilously over-inflated.

The International Summit on Human Gene Editing (December 2015) published concerns summarized by the oversight committee, but the conversation needs to continue. The far-reaching implications of gene editing for ecology, bioethics, genetics, social science, and theology places significance on this topic that should be addressed at every scientific meeting, especially at a gathering of Christian scientists.

VI.C: MENTORING SYMPOSIUM (CONT'D)

Wilden

103

Mentoring: Beyond the Buzzword Part 2: Breaking through the Yoda Complex

Sharon Carlson

As an experienced professional you have wisdom and advice to share, but you fear those you mentor will expect a life-consuming commitment requiring more time and energy than you have to invest.

As a student or young professional you desire input and guidance from those who have "gone before" you, but don't know how to find it.

So, how can mentoring work effectively and efficiently?

Learn how to identify strengths and functions for the practice of mentoring. Learn how to identify needs and intentional focus for the pursuit of mentoring.

VI.A: TEACHING SCIENCE AND FAITH (CONT'D)

Munson

Chapel

Introducing *Grand Canyon, Monument to an Ancient Earth: Can Noah's Flood Explain the Grand Canyon?*Steve Moshier
Ken Wolgemuth, presenter

The Grand Canyon is the primary focus of groups promoting flood geology and a recent creation, exhibited by a lavishly illustrated book that has been available for purchase in recent years by tourists in national park bookstores. Controversy over the book played into the culture war scenario of "science vs. religion" with attention from both Christian and secular news media.

Our book, *Grand Canyon, Monument to an Ancient Earth: Can Noah's Flood Explain the Grand Canyon?* (Grand Rapids: Kregel Publications, 2016) provides compelling evidence for an ancient history and geology of the region for the general reader that is respectful of Christian convictions about creation.

We represent multiple geoscience subdisciplines contributing to a rather comprehensive description and interpretation of canyon rocks, fossils, and landscapes.

The book opens with a brief history of the 20th-century origins of flood geology in fundamentalist Christianity. Subsequent chapters contrast the differing basic interpretations and time frames of flood geology and modern geology and review the origins of sedimentary rocks and strata, methods of determining geologic ages, how rocks are deformed and uplifted, the significance of fossils and trace fossils (including animal footprints) in rocks, and ideas about the formation of the canyon leading to the present landscape. The penultimate chapter is a guide for the South Kaibab Trail, drawing together many key concepts from the book.

The 240 pages of our book are filled with spectacular photography and original illustrations. Authors include Gregg Davidson, Joel Duff, David Elliott, Tim Helble, Carol Hill, Stephen Moshier, Wayne Ranney, Ralph Stearley, Bryan Tapp, Roger Wiens, and Ken Wolgemuth.

VI.B: LIFE AND ENVIRONMENTAL SCIENCES (CONT'D)

Wilden

102

How the Nature of Nature and the Nature of Science Affects the Nature of Creation Care

Johnny Wei-Bing Lin

For all the enriching dialogue regarding the imperative of creation care over the last several decades, relatively little work has been done regarding understanding how to determine the content of creation care.

In *The Nature of Environmental Stewardship* (Pickwick Publications, 2016, see also <http://nature.johnny-lin.com>), I formulate a taxonomy for analyzing the content of creation care that covers worldviews, ethical theories, science epistemology, science-policy studies, politics, and economics.

In this talk, I focus on two of the major parts of that taxonomy—worldviews and science epistemology—and describe how our understanding of what nature is and of how science knows strongly determines what science can say about nature and how that determination affects which science-policy models we use to translate science into policy.

VI.C: MENTORING SYMPOSIUM (CONT'D)

Wilden

103

Mentoring: Beyond the Buzzword Part 3: Practical Mentoring Near and Far

Sharon Carlson

An experience-rich and professionally diverse community like ASA provides access to a multitude of mentoring influences and relationships.

Explore how ASA members can pursue both sides of the mentoring relationship through member connection opportunities such as the Nexus forum and local chapters.

Learn how every ASA member—students and young professionals, those nearing retirement, and everyone in-between—can engage in mentoring in the ASA community!

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INDEX OF 2016 PRESENTERS

B

Barrett, Justin 4, 9, 30
Billman, Susan 5, 22, 30
Bocarsly, Andrew 5, 21, 30
Bowden, Audrey 6, 9, 30
Buller, David 5, 22, 30

C

Carlson, C. Ray 5, 25, 30
Carlson, Clayton 3, 10, 30
Carlson, Sharon 6, 27–29, 30
Couts, LeeAnn 3, 10, 30
Covolán, Roberto 5, 21, 30
Crick, Justin 4, 17, 30

D

Davis, Edward “Ted” 4, 8, 30
Dawson, Wayne 3, 15, 30
DeBoer, Gary 3, 14, 30
Dicken, Alan 3, 14, 30
Daniel Dorman 5, 21, 30

F

Fictorie, Carl 3, 13, 30
Fitzgerald-Bocarsly, Patricia 3, 12, 30
Fleming, Fraser 5, 25, 30
Freeman, Nahanni 4, 16, 30

G

Gillooley, Daniel 5, 24, 30
Gray, Terry 4, 19, 30
Grosh, Tom, IV 4, 18, 30
Guta, Mihretu 4, 17, 30

H

Haarsma, Deborah 5, 20, 30
Halsmer, Dominic 3, 14, 30
Herrington, E. Paul, IV 5, 23, 30

I

Isaac, Bryan 5, 24, 30
Isaac, Randy 3, 15, 30

J

Jelsma, Tony 4, 18, 30
Johansen, James 3, 11, 30
Jordan, William 5, 24, 30

K

Kankelborg, Charles 3, 14, 30
Klein, Stanley 5, 20, 30

L

Lin, Johnny 6, 29, 30

M

Mallary, Mitchell 4, 16, 30
 McCoy, Bradley 3, 11, 30
 McEwan, M. P. Worth 4, 18, 30
 McFarland, Benjamin 3, 13, 30
 Miller, Keith 3, 10, 30

N

Newsome, William 2, 7, 30

O

Oleskiewicz, Dana 6, 28, 30

P

Partin, Dale 3, 11, 30
 Payne, Peter 5, 20, 30
 Price, Martin 3, 14, 30

R

Rana, Fazale 6, 27, 30
 Roberts, Anjeanette 6, 28, 30
 Rogero, Walter 5, 22, 30
 Ross, Hugh 3, 13, 30
 Roundy, Bill 6, 27, 30
 Ruppel, Emily 4, 5, 16, 24, 30
 Rusbult, Craig 3, 12, 30

S

Seely, Paul 3, 15, 30
 Seybold, Kevin 5, 23, 30
 Shrier, Cahleen 5, 24, 30
 Shrier, Paul 5, 24, 30
 Sikkema, Arnold 3, 10, 30
 Sikkema, William 4, 19, 30
 Strawn, Brad 5, 25, 30
 Swamidass, S. Joshua 4, 19, 30
 Swearengen, Jack 5, 23, 30

T

Touryan, Kenell 3, 12, 30
 Tucker, Faith 4, 16–18, 30

V

Vermeer, Bruce 4, 18, 30
 Vincent, Lanny 5, 23, 30

W

Walters, James 4, 17, 30
 Warren, E. Janet 3, 11, 30
 Wiens, Roger 3, 7, 30
 Winyard, David, Sr 3, 10, 30
 Wolgemuth, Kenneth 6, 29, 30

Y

Young, Davis 4, 18, 30

WHERE DO I GO?

Metro APU/Citrus station



210 freeway

ASA Registration: Thursday	Engstrom	Lodging Check-in: Thursday–Friday	Engstrom
ASA Registration: Friday–Monday	Wilden	Lodging Check-in: Saturday–Sunday	Trinity
Anniversary Dinner	UTCC	Lodging Check-out	Trinity
Book tables	Wilden	Parallel Sessions	Munson, Wilden
CWIS Meeting	Wilden	Parking	Lot A
Devotions	Munson	Plenary Sessions	Munson
Exhibits	Wilden	Sand Volleyball Tournament	beyond Adams Hall
Field Trips departure	Parking Lot A	State of the ASA	Wilden
InterVarsity Reception	Wilden	Students and Early Career Lunch Discussion	Seegerstrom Science Center, West Campus (not shown)
Meals	1899 Dining Hall	Sunday worship	Munson
Lodging	Engstrom	Workshops	Wilden

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- The APU Office of Research and Grants
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- College of Liberal Arts and Sciences
—ice cream social
- The APU Department of Mathematics and Physics
—student discussion lunch
- The APU Department of Biology and Chemistry
—water bottles
- The John Templeton Foundation
—75th Anniversary Dinner

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