

# AMERICAN SCIENTIFIC AFFILIATION

**Annual Meeting**  
**Montreat-Anderson College**  
**Montreat, NC**  
July 22 - 25, 1995

## OPPORTUNITIES FOR CHRISTIANS IN INTERNATIONAL SCIENCE

### *Keynote Speakers*

**Dr. Larry Butler**  
Purdue University

**Dr. Bryan Duncan**  
Auburn University

**Dr. Rolf Myhrman**  
Judson College

**Robert Oehrig**  
Daystar USA

**Dr. Martin Price**  
E.C.H.O.



ASA  
P.O. Box 668  
Ipswich, MA 01938

*"Where then does wisdom come from? Where does understanding dwell?...God understands the way to it and he alone knows where it dwells, for he views the ends of the earth and sees everything under the heavens". Job 28: 20, 23-24 NIV*



**Saturday - July 22, 1995**

- 8:00 AM Field Trips - whitewater rafting, hiking
- 1:00 PM Biologists' Field Trip
- 3:00 PM Registration  
W. H. Belks Center (The Mall)
- 4:00 PM Affiliation of Christian Geologists Business Meeting
- 5:00 PM Dinner - Howerton Hall
- 7:00 PM Welcoming Remarks, Gaither Hall (Chapel)
- 7:30 PM First Plenary Speaker - Gaither Hall (Chapel)  
**Bryan Duncan - *A Tapestry of Providence***
- Mixer - Gaither Hall (Fellowship Hall)

**Sunday - July 23, 1995**

- 7:30 AM Breakfast - Howerton Hall
- 8:45 AM Leave for Mt. Mitchell
- 10:00 AM Worship Service
- 11:30 AM Picnic lunch at Mt. Mitchell
- 12:30 PM Return to Montreat-Anderson College
- 2:30 - 5:30 PM Parallel Sessions - Gaither Hall

Fellowship Hall  
Fred Hickernell, Chair

Chapel  
David Wilcox, Chair

2:30 - 2:50	Second Thoughts on the Second Law - <b>Randy Isaac</b>	2:30 - 3:05	Background of the Book - <i>Of Pandas and People</i> - <b>Steve Meyer</b>
2:50 - 3:10	Aiding University Development in Central and Eastern Europe - <b>L. Evans Roth</b>	3:05 - 3:45	Why " <i>Of Pandas and People</i> " should not be used in the biology classroom as a supplementary textbook - <b>Kenneth Miller</b>
3:10 - 3:30	Seasonal Forecasting in Israel - <b>David Decker</b>	3:45 - 3:50	Question Period
3:30 - 3:50	Instant Chinese Puddings - <b>James Wing</b>	3:50 - 4:00	Coffee Break - Fellowship Hall
3:50 - 4:10	Coffee Break - Fellowship Hall	4:00 - 4:40	Why " <i>Of Pandas and People</i> " should be used in the biology classroom as a supplementary textbook - <b>Michael Behe</b>
4:10 - 4:30	Archaeological Research in Jordan - <b>Clarence Menninga</b>	4:40 - 4:45	Question Period
4:30 - 4:50	Engineering Assistance to Developing Countries - <b>Alan Swartz</b>	4:45 - 4:55	<b>Kenneth Miller</b> - rebuttal

4:50 - 5:10	College Level Science Projects for the 3rd World - <b>Ray Brand</b>	4:55 - 5:05	<b>Michael Behe</b> - rebuttal
5:10 - 5:30	DNA Fingerprinting of Third World Plants: A Class Project - <b>Marvin Meyer</b>	5:05 - 5:30	Question period - audience can question any of the symposium participants <b>Miller, Behe, Meyer, and Wilcox</b>

6:00 PM Dinner - Howerton Hall

7:30 PM Second Plenary Speaker - Gaither Hall (Chapel)  
**Rolf Myhrman** - *Hunger-Related Laboratory Research at a Christian Liberal Arts College*

8:30 - 10:00 PM Poster Sessions - W. H. Belk Center (The Mall)  
**Joe Carson** - Esperanto, the International Language; and Promise Keepers, ASA & ASA's 2000  
**Dennis Feucht** - Opportunities for Intelligent Design Theory  
**Leon Dennison** - How the Biblical Flood Filled the Western Basins with Gravel; and The Great and Terrible Day of the Lord

8:30 - 9:30 PM Sessions - Gaither Hall

Chapel - Kenneth Olson, Chair

8:30 - 8:50	On The Design of the Vertebrate Retina <b>George Ayoub</b>
8:50 - 9:10	DNA Sequence Studies in Ancient Fossils <b>Gordon Mills</b>
9:10 - 9:30	Caring for Science Under Friendly Fire <b>Thaddeus Trenn</b>

**Monday - July 24, 1995**

7:30 AM Breakfast - Howerton Hall

9:00 AM Devotions - Gaither Hall (Chapel) - Speaker, **Walt Hearn**  
Music, **Larry and Sue Martin**

9:30 - 10:20 AM Third Plenary Speaker - Gaither Hall (Chapel)  
**Larry G. Butler** - *Agricultural Research with and for Africans*

10:20 - 10:40 AM Coffee Break - Gaither Hall (Fellowship Hall)

10:40 - 12:00 PM Parallel Sessions - Gaither Hall

	Fellowship Hall Gerald Hess, Chair	Chapel Elizabeth Zipf, Chair
10:40 - 11:00	Plasmid Acquisition in Microgravity - <b>Elizabeth B. Juergensmeyer</b>	Cultural Forces That Contribute to Environmental Degradation - <b>Uko Zylstra</b>
11:00 - 11:20	A Rapid Survey Method of Evaluating Hazard Levels of Lead In And Around Dwellings - <b>Michael Epstein</b>	Throwing Your Voice: How to be Your Own John The Baptist - <b>David Fisher</b>
11:20 - 11:40	Phyllanthus and Hepatitis B: A Case Study of Why it's Hard to Translate Ethnobotany into Natural Products Research - <b>David Unander</b>	Maybe the Bible Teaches Evolution - <b>Robert Vander Vennen</b>

12:00 PM Lunch - Howerton Hall

12:00 PM Private Dining Room, Howerton Hall  
The ASA Presence on the Internet with **Jack Haas**

1:00 PM Free Time - Field Trips

4:00 PM Business Meeting - Gaither Hall (Chapel)

6:00 PM Banquet - Howerton Hall

7:30 - 8:20 PM Fourth Plenary Speaker - Gaither Hall (Chapel)  
**Bob Oehrig** - *The Role of Social Research in the Missiological Endeavor: An East African Case Study*

8:30 - 9:30 PM Parallel Sessions - Gaither Hall

	Chapel David Moberg, Chair	Fellowship Hall Don Munro, Chair
8:30 - 8:50	The Hen's Teeth Experiment: An Update - <b>Denis Lamoureux</b>	Hindsight Translation of Genesis 1:3-5, 1:14 - 18 - <b>Dallas Cain</b>
8:50 - 9:10	International Science In The U.S. Semiconductor Industry <b>Randy Isaac</b>	Slides of Zambia - <b>Dorothy Woodside</b>
9:10 - 9:30	The Seven Dimensions of God - <b>William Nesbitt</b>	On The Slippery Slope Argument - <b>Tom Hoshiko</b>

**Tuesday - July 25, 1995**

7:30 AM Breakfast - Howerton Hall

9:00 AM Devotions - Gaither Hall (Chapel)  
Speaker, **Elizabeth Zipf**  
Music, **Larry and Sue Martin**

9:30 - 10:20 Fifth Plenary Speaker - Gaither Hall (Chapel)  
**Martin Price**- *Making Science Work for the Poor*

10:20 - 10:40 Coffee Break - Gaither Hall

10:40 - 12:00 Parallel Session - Gaither Hall

	Fellowship Hall Ray Brand - Chair	Chapel Sara Miles - Chair
10:40 - 11:00	The International Ministry of the Institute for Christian Studies <b>Robert VanderVennen</b>	Purpose & Meaning in Scientific Perspective - <b>Daniel Osmond</b>
11:00 - 11:20	Deriving a Biblical View of Morphogenesis - <b>David Wilcox</b>	The Pedagogical Advantages of Outrageous Cases - <b>James Peterson</b>

11:20 - 11:40	Creavolution - <b>Dick Fisher</b>	Edwards v. Aquillard and Its Implications for Science Education - <b>Sherman Kanagy</b>
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11:45 AM Prayer for ASA in the chapel before lunch  
Gaither Hall

12:00 Noon Lunch

Field Trips to Biltmore Estate - Guided Tour

Chimney Rock

Geology Field Trip

Close of conference and check out at 3:00 PM. Please return your key and name badge. Thank you!

The ASA would like to extend our thanks to Martin Price, Program Chair and Mike Sonnenberg, Local Arrangements Chair, for their support toward this year's Annual Meeting.

More information about the American Scientific Affiliation may be obtained at the literature table in the W. H. Belks Center or by writing to the national office:

American Scientific Affiliation  
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**AMERICAN SCIENTIFIC  
AFFILIATION**

**ABSTRACTS**

**OPPORTUNITIES FOR CHRISTIANS  
IN INTERNATIONAL SCIENCE**

Montreat-Anderson College  
Montreat, NC

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## **COLLEGE LEVEL SCIENCE PROJECTS FOR THE THIRD WORLD**

**Raymond H. Brand  
The Morton Arboretum  
Lisle, IL**

In the late 1970's Wheaton College began an educational program that involved junior level students in a six month internship in a Third World country. It was called the Human Needs and Global Resources (HNGR) program and including the 32 students participating this summer, 293 students will have completed the program by the end of the year. An earlier version of this paper was presented at the 1983 ASA Annual Meeting at George Fox College when the HNGR program was in its infancy. In light of the theme for the 1995 Annual Meeting, it seemed appropriate to re-visit this creative program for a second look after almost 20 years of operation.

Of 213 completed project reports, 78 or 27% were primarily concentrated in the natural sciences. Biology, chemistry, and physics projects dominated the total, but several closely related applied fields such as forestry or agriculture were also represented.

Although the major benefit of the program was the educational experience of the student in the Third World culture, a number of the science projects carried out were designed to be useful to the indigenous people of the country visited.

As a stimulus for possible future involvement of ASA members in contributing to the sustainable development of Third World countries, selected projects will be discussed and illustrated along with summary tables of countries included and science fields represented.

## AGRICULTURAL RESEARCH WITH AND FOR AFRICANS

Larry G. Butler  
Department of Biochemistry  
Purdue University  
West Lafayette, IN

Originally an Oklahoma farm boy, my life has been marked by unexpected opportunities: university education, specialized research training, challenging basic research, interdisciplinary applied research, international travel and collaboration, and the satisfaction of seeing the results of my research in the field of African farmers. Finding less than the desired satisfaction in fundamental biochemical research, I made a mid-career change to join an interdisciplinary team seeking to improve the production and nutritional quality of sorghum, the major traditional cereal crop of Africa. Funding has been provided by USAID and the Rockefeller and McKnight Foundations. The original focus was the antinutritional effects of tannins in sorghum grain. This led to characterization of several sorghum polyphenols and their mode of interaction with dietary and herbivore proteins, their physiological effect on herbivores (and mechanisms by which herbivores defend themselves), and their role in protecting the sorghum plant against grainivorous birds and fungal diseases. Another major project involves the parasitic weed, *Striga* (witchweed), which has become the greatest biological constraint on cereal production in Africa. *Striga*'s development is under host plant control via a series of chemical signals, some we have identified. Eight *Striga*-resistant sorghums developed in collaboration with Dr. Gebisa Ejeta, sorghum breeder, have recently been released, and are being distributed in Africa by World Vision, International, with support by USAID. New initiatives include mapping many sorghum genes, tissue culture of sorghum and *Striga*, and transformation of sorghum with genes from other organisms.

## HINDSIGHT TRANSLATION OF GENESIS 1:3-5, 1:14 -18

Dallas E. Cain  
Scotia, NY

Concordism has failed. In two-hundred years it never found the key to unlock the discord between The Book of God's WORDS and The Book of God's WORKS. The problem lies in the traditional translations of Genesis One which unfortunately project the level of science of the 1500s. If the translators of the King James Version had the advantage of 1800s information (skip 1859), there would be no discord between WORDS and WORKS. A mid-course correction is overdue. Fortunately, discord is limited to the four environmental works— 1-light, 2-expanse, 3-land/seas, and 5-lights. This paper addresses 1 and 5. In 1:3-5, "light" to pre-science hearers is defined within the text as "day" or daylight. At 1:16, God's WORKS disclose that "God made two great lights" should be translated as "God had made two great lights." All in all, a dozen alternates are used in a Minimal Revision, and an Unmistakable Version takes a dozen more. With mid-course correction, who will miss Concordism?

## ESPERANTO, THE INTERNATIONAL LANGUAGE

Joseph Carson, P.E.  
Department of Energy  
Oak Ridge  
Knoxville, TN

This poster presentation will be of Esperanto, the International Language. Many booklets from the Esperanto League of North America (ELNA) will be distributed describing the grammar and morphology of Esperanto. Comparison will be made of Esperanto's features with the world's other major languages. International Scientific and Christian Evangelical Organizations that use and promote Esperanto will be included.

**PROMISE KEEPERS, ASA  
AND  
ASA'S 2000 BY 2000 CAMPAIGN**

Joseph Carson, P.E.  
Department of Energy  
Oak Ridge  
Knoxville, TN

This poster presentation will be of Promise Keepers, the interdenominational, interracial Christian men's movement, that will draw about 1,000,000 men to large scale events in America in 1995. Booklets about Promise Keepers, local contacts in all parts of USA, and demographic material on Promise Keepers of interest to the ASA 2000 by 2000 campaign will be displayed.

**SEASONAL FORECASTING IN ISRAEL**

David Neal Decker  
Research Meteorologist  
P. O. Box 304  
Kiron, Israel

Israel's climate is the typical Mediterranean type defined by short rainy winters and long rainless summers. Because the amount of rainfall each winter is highly variable, a big effort has been made to predict the type of winter (dry, average, wet) before the onset each year. A reliable precipitation forecast can be very useful for hydrological and agricultural concerns and have a positive import on national planning and the economy. Given the wavelengths involved in the mean position of disturbed weather zones, on a planetary scale, a direct relation has been found between the type of winter in Israel and other parts of the world, such as Southern California. The winter of 1991-1992 proved to be the wettest winter on record in Israel and brought a dramatic end to a prolonged drought.

The spiritual climate of Israel is also of great interest to this researcher. The growth of Messianic faith has been significant in the last 25 years and long

range Bible predictions indicate that a season of great spiritual revival lies just ahead.

**HOW THE BIBLICAL FLOOD FILLED  
THE WESTERN BASINS WITH GRAVEL**

J. Leon Dennison  
Quaternary Studies  
Olympia, WA

The alluvium of the Western basin valleys indicates that a singular, recent, and powerful event washed gravel and boulders out of the Western mountains and pushed them many miles into the basins of large lakes. Boulders and cobbles are found in gravel pits located miles out in the alluvial fill of these former lakes. Clay and silt which should comprise the vast majority of the volume of the alluvium in the basins, is actually only a much smaller percentage. The shape and slope of the alluvial fans which transition from the mouths of mountain canyons to the floors of the basin valleys are smooth-graded and homogenous in their alluvial content. The gentle sloping surfaces of the alluvial fans and the gravel content of the basin alluvial fill point to a single hydrologic event. Drilling operations have brought to the surface, wood and plant debris buried deep in the gravel alluvium. Excavations often expose the disarticulated remains of Pleistocene animals. Disarticulated remains are also uncovered by the wind as it blows away the top cover of dry lakes. The Pleistocene was a time of large numbers and vast herds of well fed animals, not a time of freezing drought. The Biblical flood was the event that created our deep gravel aquifers, built the glaciers, and caused the extinction of hundreds of Pleistocene mammal species. Ecological policies based on the interpretation of data from Pleistocene deposits could be faulty if the theory about the nature of the Pleistocene is faulty. This study centers around the former basin lake that is now Pleasant Valley (Coalinga), CA.



**THE GREAT AND TERRIBLE DAY OF THE LORD:  
A SCIENTIFIC MODEL OF THE PROPHESED JUDGMENT  
OF THE LORD**

J. Leon Dennison  
Quaternary Studies  
Olympia, WA

The title of the book screamed "*Why Did Not the Heavens Darken*". Predictable, the book was a very well done and thoroughly researched treatise on the Holocaust by an author of Jewish descent. What is the Day of the Lord that Arno Mayer would even ask the question related to darkness about the time when European Jewry was under terrible persecution. Two of the first three writing prophets, Joel and Obadiah, give definitions of the Day of the Lord and wrote of the Day of the Lord in a manner as if there existed an understanding of that term in their day. All of the Writing Prophets, except Jonah, wrote about the Day of the Lord. It will be a time of absolute darkness. It will be a time when the Lord will shake and make to tremble the heavens and the earth, the whole earth at one time. What is left of the cities of the nations shall fall and the slain of the Lord on that day shall be from one end of the earth to the other. Why does the Lord become fiery angry? Why will His judgment be served to the point of almost ending life on earth, by breaking the photosynthesis cycle? The Day of the Lord is the Day when the Lord unleashes His fiery weapon on the Earth. What deeds and actions does (or will) the human race practice and he in the act of doing that will motivate and force the Lord to undertake such extreme judgment?

**A TAPESTRY OF PROVIDENCE**

Bryan L. Duncan  
Director and Professor  
International Center for Aquaculture and Aquatic Environments  
Auburn University  
Auburn, AL

To describe my involvements in international science is no less than a testimony to God's providence. It would not have been possible for me to plan events as they have happened. Beginning with service in the U.S.

Peace Corps, I found myself involved in the field of aquaculture, which has great utility for contributing to economic development, dietary supplementation and efficient utilization and conservation of natural resources. My subsequent affiliation with one of the leading aquacultural programs in the world gave opportunity for international involvement. Among spinoffs were opportunities to become acquainted with mission organizations, their programs and needs, and to begin interactions with them. Among many American and international students attracted to the aquacultural program were Christians with whom special relationships were formed. Some have become close friends and colleagues, and other have gone on to other places of service. New institutional relationships, including the formation of Living Water International, Inc., have resulted from a refining of focus and energies and a desire to serve people better with science and technology. While God provides and directs the events of our lives, there are courses of action one can take to prepare for international ministry and service. These include affiliating with an established international program, identifying a geographical preference, making international friends, learning a language, and being willing to perform tasks of service and facilitation.

**A RAPID SURVEY METHOD FOR EVALUATING HAZARDOUS  
LEVELS OF LEAD IN AND AROUND DWELLINGS**

Michael S. Epstein, Research Chemist, Chemical Science and  
Technology Laboratory, National Institute of Standards and Technology,  
Gaithersburg, MD

Sarah M. Smith, Student, Yorktown High School, Arlington, VA  
Joseph J. Breen, Chief, Industrial Chemistry Branch, Office of Pollution  
Prevention and Toxics, U.S. Environmental Protection Agency,  
Washington D.C.

Public health officials have identified lead as the primary "preventable" environmental hazard faced by children. Paint, household dust, and contaminated soil are sources of lead exposure for young children and infants, who are especially at risk because they often put their hands, which may be contaminated, in their mouths. Lead ingestion by children may cause learning deficits, hearing loss, growth retardation, anemia, and

behavioral disorders. Severe lead exposure can lead to coma, convulsions, and death. There is a critical need for rapid and accurate analytical technology to identify individuals at risk.

The ideal analytical method for the assessment of environmental contamination by toxic elements such as lead should be rapid and cost-effective, while retaining enough accuracy and precision to allow conclusions to be drawn from the data. Most analytical techniques do not meet these criteria. To obtain reasonably accurate results, they require the sample to be leached or dissolved in an acid media or fused at high temperature into a soluble form. Such sample preparation demands decrease sample throughput and thus lengthen the response time for remediation, as well as requiring dedicated and expensive technician time. The few analytical methods that can be modified for direct elemental analysis of solids without pretreatment, such as x-ray fluorescence spectrometry, are limited by cost, sensitivity, matrix interferences, or sample size. The slurry method of sample introduction for electrothermal atomic absorption spectrometry (slurry-ETAAS), which we use in this study, provides a unique combination of minimal sample preparation, proven accuracy, low cost instrumentation, and rapid and unattended sample throughput that makes it ideal for the evaluation of large numbers of samples for toxic element contamination.

This paper will report the second phase of a study, begun in 1994, to evaluate the usefulness of slurry-ETAAS for rapid environmental assessments. The first part of the study, to be published in early 1995, involved a survey of paint and soil from 53 parks and playgrounds in Arlington County, Virginia. The analysis results indicated a significant number of sites at which further evaluation was needed. The second phase of the study, to be reported here, involved (a) the re-evaluation of high lead level parks noted in the previous study to establish the exact source of lead contamination; (b) an extensive survey of paint, soil, and dust from dwellings built before 1960; and (c) a comparison of the slurry-ETAAS method to determinations made with a portable x-ray fluorescence analyzer of lead on painted surfaces.

This study originated as a high school science project on the part of coauthor Sarah Smith. It is being submitted as an entry for an ASA Caring for People Research Award for 1995.

## OPPORTUNITIES FOR INTELLIGENT DESIGN THEORY

Dennis L. Feucht  
Innovatia Laboratories  
Townville, PA

The application of functional theories in engineering and as studied in artificial intelligence demonstrated the necessity for functional explanations of complex systems and suggest that their application in the life sciences could provide new insight that either obviate or subsume Darwinian theory. The key concepts of design and chance are given in detailed explanation. Finally, the interaction of IDT as science and the task of ridding science of accidentalism face various temptations and opportunities.

## CREAVOLUTION

Dick Fischer  
2317 N Jackson St.  
Arlington, VA

A Synthesis of Genesis 1-11,  
Science, and History

The most popular theories that attempt to reconcile Genesis with science and history have been young earth creationism, gap theory, progressive creation, and theistic evolution. Unfortunately, all come prepackaged with disabling liabilities. The purpose of this paper is to introduce a method of apology that (1) supports the integrity of Scripture and recognizes the historicity of the Genesis account; (2) gives full value to the most recent findings of modern science; and (3) takes into account the history of the region where the biblical narrative originates. With this method of apology, Genesis, science, and history are closely (maybe entirely) reconciled.

The Hebrew word "*bara'*," rendered "created," in the first two chapters of Genesis, is connected to three definite acts: the creation of heaven and earth, the creation of sea life, and the creation of a specific man and a specific woman. The man God created was Adam, and the woman was from Adam

(Gen. 5:1-2; I Tim. 2:13). The word "created," where it pertains to man, identifies Adam (and Eve). Any other acts of special creation, though possible, are without biblical foundation.

Adam's place in history, about 7,000 years ago in Southern Mesopotamia, comes far too late in human history for him to have been the progenitor of the entire human race. Noah's flood around 5,000 years ago apparently was judgment upon the Adamites, not upon mankind in general. The notion that Adam of Genesis was the first mammalian biped has been an unwarranted road block, an unnecessary impediment in resolving the creation versus evolution dilemma.

### THROWING YOUR VOICE: HOW TO BE YOUR OWN JOHN THE BAPTIST

David Ernest Fisher  
Editor, "Truth In The Test Tube" broadcast  
Wheaton, IL

ASA member Dave Fisher deals with the "science-faith interface" in a weekly broadcast for Russian students. He suggests ways the program can benefit ASAers:

1. If going to Russia or other CIS states, a member's reputation can precede him or her. Listeners hear information about his professional activities, his/her understanding of a biblical passage, and how the two interface in life. The broadcast can "prepare the way" to attract a large audience for a personal appearance the speaker makes in Russia.
2. An ASAer not expecting to travel to the CIS can help overcome the listener's inclination to think that only the uneducated believe in God. In writing or orally, he can detail (a) his/her professional qualifications, (b) how he integrated his scientific specialty with Christianity and/or (c) an autobiographical sketch or interview of his spiritual pilgrimage.
3. Listeners can be told about the existence and contact points of organizations such as ASA, ECHO, and Christian College Coalition, Christian Medical & Dental Society, or other professional groups. They may be encouraged to start a Russian chapter, if appropriate.

The broadcast is also being expanded into Arabic, Romanian and possibly

other languages.

### ON THE SLIPPERY SLOPE ARGUMENT

T. Hoshiko  
Department of Physiology & Biophysics  
Case Western Reserve University  
Cleveland, OH

In the current debate on human embryo research, proponents of embryo research refuse the living human embryo and rights. Then the major if not the only fall-back position available is the so-called "slippery slope argument". Bernard Williams (1) supports research on the living human embryo as morally justified by discounting the slippery slope argument. He argues that a "reasonable" and "effective" stop line can be drawn, namely the fourteen-day rule. But in a previous article, Williams (2) cited the slippery slope argument being used against *in vitro* fertilization, namely that IVF would lead to "the horrible results of experimentation on developed embryos." That is precisely what has happened: the slippery slope did its work. A major embryo research stated that the fourteen-day rule "was without doubt a compromise between the scientific community and what society is prepared to accept" (3). Thus the "reasonable" and "effective" line is clearly arbitrary and is already under sustained attack. The prospect is analogous to past experience: "many doctors did not accept abortion until the law was changed" but "changed their minds after the law was changed" (4) The slope is slippery because human sensibilities get dulled and the result is glossed over by the theorizing of professional ethicists who are unwilling to acknowledge the validity of an absolute standard.

- (1) Human Embryo Research: Yes or No? London, 1986
- (2) Moral Dilemmas in Modern Medicine, Oxford, 1985, p. 126
- (3) Braude, P. R., "Status of the pre-embryo" Ref. (1)
- (4) Edwards, R. G., "Status of the pre-embryo" Ref. (1)

## SECOND THOUGHTS ON THE SECOND LAW

Randy Isaac  
IBM Microelectronics Division  
Essex Junction, VT

A common formulation of the second law of thermodynamics is that the entropy of a closed system always tends to increase. This increase is sometimes contrasted with the tendency toward increasing complexity of organisms in the theory of evolution. In this paper we take another look at the second law of thermodynamics and find that it predicts, in a sense, the wide diversity of life forms on the earth.

Mathematically, the second law of thermodynamics states that any system will tend toward minimizing the free energy which depends on internal energy, entropy, temperature, pressure, and volume. Accurate determination of these parameters for complex macroscopic systems is virtually impossible but qualitative estimates can help us understand implications of the second law.

First, we consider the formation of a single-cell organism with complex biochemical structures such as DNA. The standard free energy of formation of these molecules is negative which means that their formation is thermodynamically possible.

Next, we consider the reproduction of embryos. It can be observed empirically that an embryo can develop into an organism that can produce new embryos. Each step of this process obeys the second law of thermodynamics.

Finally, we consider a world populated with a large number of individual organisms that can be represented by their single-cell genetic structure. Basic equations for entropy show that entropy is maximized for the widest diversity of individuals compared to the case where all individuals are equal. In this sense, the second law of thermodynamics favors the wide diversity of organic beings predicted by the theory of evolution.

## INTERNATIONAL SCIENCE IN THE U.S. SEMICONDUCTOR INDUSTRY

Randy Isaac  
IBM Microelectronics Division  
Essex Junction, VT

The rapid trend toward global cooperation in the semiconductor industry provides an opportunity for international service in the domain of a domestic corporation. One of the largest technology alliances in the semiconductor memory industry is the joint work by IBM, Siemens, and Toshiba. As project manager of this task to develop 64Mb DRAM technology, it has been my privilege to work closely with international employees while in the US. After a brief introduction of the technical objectives and challenges of this project, this paper will focus on the cultural and spiritual interactions observed in the course of the work.

Cultural differences such as decision-making styles, methods of exchanging information, and the leadership role had major impacts on the work. For the Japanese, making a decision is an informal process relying on "nemawashi" or the preparation by individual conversations prior to any meeting. For those from a western culture, a meeting with all relevant participants is a more natural setting for a decision. Bringing these different styles together into a single productive team was a major challenge for the project leadership.

The employees on the team had a vast range of religious perspectives, from Buddhist to Jewish to Catholic to Hindu to atheist to evangelicals. Technical expertise did not correlate with religious beliefs. Examples of individuals from these religious positions will be given to show how their spiritual views influenced their work and their interaction with other team members.

The experience of this project has taught me that international Christian service is not limited to Christian organizations or even to traveling overseas but is possible in our own country within the realm of a business corporation.

## PLASMID ACQUISITION IN MICROGRAVITY

E.B. Juergensmeyer<sup>1</sup>, M.A. Juergensmeyer<sup>2</sup>, J.A. Guikema<sup>2</sup>

<sup>1</sup>Judson College, Elgin, IL,

<sup>2</sup>Kansas State University, Manhattan, KS,

As people explore the reaches of space, we will not be alone. Wherever we go, bacteria will undoubtedly go with us. This is of concern to us, because under the conditions of microgravity, the immune system is compromised, while bacterial growth rates are often enhanced. In the crowded confines of a space vehicle, autoflora from one astronaut can pass to another and even colonize. Most important, many bacteria become more resistant to antibiotics in microgravity, putting even more of a strain on the immune system. Resistance to antibiotics is frequently carried on a plasmid, and on the ground it is relatively simple to render bacteria competent, or able to take up plasmids. Exposure to calcium chloride at low temperature, followed by heat shock, causes some bacteria to take up plasmid DNA in their vicinity. We have modified the standard protocol for plasmid transformation in *Escherichia coli* to study plasmid acquisition in microgravity. Using a previously NASA-flight-certified hardware package, the Fluid Processing Apparatus, we were able to study plasmid acquisition during the flight of the Shuttle Discovery in February, 1995. Under our procedure, *E. coli* could remain competent and acquire a plasmid in microgravity, although to a lesser extent than *E. coli* under the same procedure on the ground.

### EDWARDS v. AGUILLARD AND

### ITS IMPLICATIONS FOR SCIENCE EDUCATION

Dr. Sherman Paul Kanagy, II  
Associate Professor of Physics  
Charleston Southern University  
Charleston, SC

Edwards v. Aguillard, along with earlier court cases such as McLean v. Arkansas, of necessity have involved decisions about the proper demarcation of science from religion. Reasons the scientific and religious communities should be concerned about these court decisions, as well as

about the arguments used in the defense of the decisions, are discussed. A critique of particular lines of reasoning used in Edwards v. Aguillard is given, accompanied by a discussion of several specific applications of court reasoning, including: (1) appearance (*contra* "creation") of the universe *ex nihilo*, (2) the occurrence of a global flood in historical times, and (3) the Star of the Magi. Overreaction to the alleged threat of creation science has produced a potentially damaging situation for science education and for those religious sects, such as those favoring evidentialist apologetics, which treat scientific evidence as important to decisions about religious commitment.

### THE HEN'S TEETH EXPERIMENT: AN UPDATE

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In 1980 Chris Fisher and Edward Kollar published a paper in *Science* (207: 993-995) that seemed to offer convincing *experimental* evidence for macroevolution. They took mouse prederental tissue and enzymatically separated the epithelium from the mesenchyme. Similarly they performed an epithelial-mesenchymal separation with the oral tissues of a chick. Mouse mesenchyme was then combined with chick epithelium and grafted intraocularly into an adult murine host. The resultant grafts offered two opposing cellular product layers sandwiched between the murine and avian tissues. Such a tissue arrangement is similar to that found in normal dental development—the epithelial product enamel opposes the mesenchymal product dentine. Fisher and Kollar suggested that the chick epithelium secreted enamel proteins and that the genetic information necessary for this synthesis was not lost in the reptilian-avian transition. The fact that birds do not have teeth but appear to have quiescent genes for enamel synthesis reasonably suggests the evolutionary continuity between aves and its toothed ancestors the reptiles. The importance of this experiment is seen in the fact that it has been popularized by Stephen Jay Gould as reflected in the title of his book *Hen's Teeth and Horse's Toes* (1983).

The current paper (1) directly reviews and critiques this experiment, (2) presents responses in the literature to this experiment, (3) examines similar dental experimental models, (4) provides a brief update of the advances in



dental molecular biology, and (5) offers technical insights by an experimentalist who has performed similar dental experiments. The paper concludes that caution is required in approaching the Fisher and Kollar experiment since it is a premolecular experiment and that it has been interpreted in that context. Recent advances in dental molecular biology suggests that odontogenesis is the result of inordinately complex set of epithelial-mesenchymal interactions, and as a result appreciating this experiment in its premolecular context may prove to be a misleading oversimplification.

### ARCHAEOLOGICAL RESEARCH IN JORDAN

Clarence Menninga  
Calvin College  
Grand Rapids, MI

During the summers of 1992 and 1994 I participated in archaeological excavation at the site of the ancient Decapolis city of Abila in northern Jordan. The excavation is directed by Dr. W. Harold Mare of Covenant Theological Seminary, St. Louis. Excavations have been carried out in summers of even-numbered years since 1980. Currently seven areas within the site are being excavated.

There are two aspects of the study in which I have been involved. First, I have been designated the geology resource person, and I am expected to aid other members of the team in understanding the local geology, and in identifying any unknown stone materials in the structures being excavated. Secondly, I have been engaged in excavation of a Byzantine church (basilica) at Abila. The four corners of the main structure were identified in 1994, but much work remains to be done in excavating the interior, the outside walls, and the adjacent areas. The structure has been determined to be a cruciform trapezoid basilica.

There are several locations in addition to Abila at which excavations are being carried out under the direction of Christian organizations and Christian workers. Archaeologists are welcomed visitors in Jordan. Representatives of the Jordanian Department of Antiquities are involved in the organization of the excavation, and are very helpful. There are also opportunities to interact with archaeologists and geologists from nearby

universities and from official government agencies.

### DNA FINGERPRINTING OF THIRD-WORLD PLANTS: A CLASS PROJECT

Marvin W. Meyer  
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Biology Department  
St. Davids, PA

Velvet bean was used as an example of a third-world plant that is making a significant resurgence as an agriculturally important species. Seeds of velvet bean are being sent to ECHO from around the world, including Central America, Africa and Southeast Asia. The source and history of these seeds is not well documented, thus there is a need for clearly identifying these varieties. New molecular techniques have recently been developed to aid in this identification.

Our Biology Department at Eastern College has recently developed a required senior-level course called "Molecular Investigations". This course was designed to give students a research-oriented experience in using molecular techniques in the laboratory. I would like to report on the project we chose for the 1994-1995 year, that of finding DNA fingerprint identification of varieties of velvet bean. Seeds were obtained from ECHO and planted in the lab. DNA extractions were performed on both seeds and leaves of young plants. This DNA was then incubated with restriction endonucleases and run on gel electrophoresis. This gave us bands which can aid in identifying varieties. Southern bolts were also tried, using non-radioactive techniques to develop them. In addition, a PCR technique was carried out on the rbcL gene. The promises and pitfalls of these approaches will be discussed

## **DNA SEQUENCE STUDIES IN ANCIENT FOSSILS**

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Galveston, TX

In the past four years some studies on DNA sequences in ancient fossils have received considerable media attention. There have been two reports of DNA sequences obtained from magnolia and bald cypress leaf chloroplasts in 17-20 million year old fossils found in Miocene sediments in Idaho. These fossil plant DNAs, which were 759 and 1320 nucleotide bases in length, code for a subunit of an important chloroplast enzyme. Also, DNA segments (210 nucleotide bases), which code for a ribosomal RNA, have been sequenced from a 25-30 million year old fossil termite imbedded in amber. Even more recently, a short DNA segment (133 nucleotide bases) from a mitochondrial gene for cytochrome b has been sequenced. This DNA segment was amplified from the interior of an 80-85 million year old dinosaur bone. This dinosaur bone was found in sandstone above a coal seam at a depth of 610 meters. The author will evaluate the techniques and procedures utilized in obtaining these sequences of fossil DNA, and will discuss the significance of the results to evolutionary theory and to the author's theory of theistic evolution.

## **HUNGER-RELATED LABORATORY RESEARCH AT A CHRISTIAN LIBERAL ARTS COLLEGE**

Rolf Myhrman  
Judson College  
Elgin, Illinois

At Judson, we have established a nutrition research program for the purpose of 1) improving the quality of life in developing countries by facilitating the detoxification of potential food plants and the development of appropriate technologies for weed and insect control; and 2) involving undergraduate students in research projects in biochemistry and cell biology which can be expected to benefit people in the near future.

In practice, the program supports the efforts of mission agencies and

nonprofit agricultural organizations by developing cooperative research projects and by providing analytical services at no cost.

The current emphasis is on the velvet bean, which grows readily in humid tropical climates, including those of Central America, West Africa, India, and the Philippines. Velvet beans are rich in protein, and could play a significant role in the relief of malnutrition in those areas. Although they are used as soil conditioners and animal feed, they are generally avoided in human diets because they contain toxins which are not removed by normal cooking procedures. Research at Judson in cooperation with CIMMYT (International Maize and Wheat Improvement Center) in Mexico, and IITA (International Institute of Tropical Agriculture) in Benin, has demonstrated that some varieties of velvet beans contain much lower levels of toxins than others, and might therefore be candidates for wide distribution. Our students have also discovered that most of the toxic material can be removed from velvet bean flour by relatively simple laboratory procedures. Work is now underway to adapt these methods for use in villages and farms in the Third World.

In the near future, we hope to expand our efforts to include other plants which represent underutilized sources of protein. We are also interested in the isolation of natural insecticides from plant material, and will be developing analytical procedures to assist those who are working in that area.

## **THE SEVEN DIMENSIONS OF GOD**

William R. Nesbitt, M.D.  
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Fairfield, CA

Recognizing that God can not be defined or limited by human imagination, never-the-less, I believe that He encourages us to use our minds to their fullest capacity to understand as much as we possibly can about Him.

I would like to propose a model that has been very enlightening to me. The model consists of the usual three spatial dimensions encompassed by three dimensions in time. The fourth dimension, as has been frequently stated is a longitudinal dimension running from the infinite past into the infinite

future. I propose that the fifth dimension is a lateral dimension in time, evidenced by side by side events on a time plane. The sixth dimension is a vertical dimension resulting in a time solid and it is in that direction that we find God, heaven and spiritual reality. By conceiving of God as being just above us in time He can be imperceptible to those looking laterally in time-space but remarkably real to those who are looking up in the sixth dimension.

Using the logic of euclidian geometry one constructs objects by projecting lines at right angles to other lines. This progression can go on to infinity but for our purposes we can go one step further than the sixth dimension and project a seventh dimension in which a being exists that encompasses all of time and space.

Within this concept lie explanations of many Biblical doctrines. This paper will explore some implications of this theory.

### **THE ROLE OF SOCIAL RESEARCH IN THE MISSIOLOGICAL ENDEAVOR: AN EAST AFRICAN CASE STUDY**

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This paper conducts an overview of social research as it relates to Christian communication and church ministry in East Africa today. It evaluates current research activities being conducted within East African ministries while also pointing out research approaches which are bearing fruit for missiologists and church workers.

The paper first explores the legitimacy of research in the church in general, and surveys on Christian work in particular, raising questions like "can we do research on the work of the Holy Spirit?" It quickly draws the conclusion from scripture and history that God the creator is both a searcher and communicator who desires his people to use all means to more effectively communicate God's love, and spread Kingdom values in society

and institutional structures. Yet, the author bemoans the fact that the use of the scientific method in missions has often been overlooked because:

- of the false notion that it is too costly, when in fact the cost of not doing research is often extremely steep in terms of wasted activities and resources.
- funding and sponsoring agencies are reluctant to finance programs which do not directly relate to evangelistic and church planting activity.
- among the more theologically conservative, research is viewed with suspicion since the use of the scientific method is felt to minimize God's part in the communication process.
- the African church has few trained in research methods.
- there is a basic suspicion of research approaches which are often based on Western definitions, measurement methods and interpretation models.

The paper then outlines three major areas of social research, providing contemporary East African examples of each, as they are being used in the missiological endeavor. These are (1) Audience analysis research, sometimes called exploratory or environmental research, which seeks to understand a "people group" or community in demographic terms which also uncovering interests and needs, values and beliefs, and spiritual receptivity; (2) Research to determine communication strategy which most frequently uses pre-testing tools and related statistical methods to evaluate alternative plans and communication methods before embarking on a strategy; (3) Research to analyze effectiveness, which seeks to assess the results of one's missiological approach and the audience's comprehension and response to the message.

Finally, the author maintains that for research to play a vital role in the ministry of the African church, serious consideration must be given to appropriate contextual research models and approaches. Can the theories based on and tested by sociologists in the West be adapted to developing countries? Using Western scholastic methods without consideration of the local situation is nothing less than "research colonialism". The problems of



"westernized" quantitative research are not only in the mathematical approached used, but in sampling, interviewing, question formulation and the whole process leading to data analysis. The time has clearly come for the Christian mission enterprise in Africa not only to take the role of research more seriously, but to develop and test research models and data collection approaches which do not rely so heavily on transference of foreign paradigms.

### PURPOSE AND MEANING IN SCIENTIFIC PERSPECTIVE

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This presentation summarizes the substance of Templeton Lectures given in various US cities during late 1994 and early 1995. It examines the perception in some circles that, "Darwinism eliminates purpose in any form and implies that animal evolution, including that of man, was the result of blind chance". This is obviously contrary to the Scriptural view of a God of Purpose who commissions His disciples to a life of Purpose in both temporal and spiritual dimensions (The Great Commission).

I address such apparently conflicting positions by recalling that most functional people display at least 3 levels of purpose in their lives. Level #1 represents essential activities of daily life, e.g. eating, studying or working; Level #2 represents the broader personal context into which such daily activities fit, e.g. keeping healthy or advancing one's career; and Level #3 involves utilizing one's career to improve one's community, country or world. These 3 levels of purpose are self-evident, widely experienced and therefore cannot be said to have "been eliminated" by any form of "Darwinism".

Thus, a fourth level of purpose should be considered, i.e. Higher Purpose, which, for the Christian, involved the so-called Creation and Evangelistic Mandates, under God. Presumably, it is this kind of Purpose that "Darwinism" (in this case representing myopic scientism) considered to be obsolete. Yet, it is demonstrable that such Purpose transforms, informs,

motivates, energizes and empowers countless believers at all levels of their lives. It cannot be discounted by any responsible observer of the human condition. Moreover, in unbelievers, the God of Purpose is invariably replaced by lesser, oppressive gods, whose evil influences are all too evident, though not often acknowledged. Thus, the choice is not between "Higher Purpose & Nothing" but between "Higher Purpose and lower purposes".

Historically, many prominent scientists espoused Higher Purpose, providing living proof that such faith can co-exist very well with scientific thinking and achievement. Beyond that, I will briefly address 5 major lines of argument against Higher Purpose: (1) it is unnecessary; (2) we are here by chance; (3) we are nothing but products of Evolution; (4) the Galileo controversy settled the matter; and (5) the existence of evil, pain and suffering argues against it. Thorny as these arguments might be, they do not, but any means, provide airtight cases against Higher Purpose.

Addressing such arguments against Higher Purpose may serve to diminish obstacles to faith. But only an encounter with the Living God can give birth to true faith in Him and in His Higher Purpose. Such faith, translated into good works over the ages, has brought inestimable benefits to the World, which are often taken for granted. It is appropriate to acknowledge the roots and celebrate the fruits of such benefits in the lives and actions of countless men and women of Higher Purpose.

### "THE PEDAGOGICAL ADVANTAGES OF OUTRAGEOUS CASES"

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The statistical research foundational to this paper was made possible by a grant from the Jessie Ball duPont Foundation.

Case descriptions pervade the teaching of medical ethics. The ones chosen for textbooks are almost exclusively convoluted dilemmas. By "dilemma"

I mean a situation where justification is not just inconclusive, rather when at least two of the widely recognized standard principles (justice, non-maleficence, beneficence, and autonomy) conflict so that one must yield, therefore no response, regardless of perspicacity, can fully honor all the involved ethical concerns. Such dilemma cases have many pedagogical advantages, but also some insidious side effects. For this presentation, I will briefly explain the statistical methods and results of my study that verify the almost exclusive use of dilemma cases in the major medical ethics textbooks, evaluate the positive and negative impact of that dominance, and argue for the continued use of dilemmas balanced by some other types of cases for more effective teaching.

### MAKING SCIENCE WORK FOR THE POOR

Martin Price  
E.C.H.O.  
N. Ft. Myers, FL

Becoming a Christian as a college sophomore greatly complicated my life. I had decided as a high school sophomore to become a biochemistry professor. Ephesians says God created us for good works that He prepared before hand that we should walk in them. What good works might God have prepared for me as a scientist, and how would I find out? I eventually narrowed it down to the question of, "How can I use science and technology to minister through missionaries to the poor?" My graduate research on mechanism for addition of cyanideion to n-dodecylnicotinamide bromide hardly seemed the way.

After a decade of preparation, He led me to Executive Director of a non-profit Christian organization that specializes in helping missionaries help those who must farm under difficult conditions of many kinds. The help is with seeds of potential new crops, answering technical questions, advice of how to set up a project that would really make a difference. We encourage missionaries to be their own experimenters.

But this is not so much a talk about the ministry or the plants, but the journey to get to this point and some insights gained along the way. Some thoughts will also be shared about the difficulty missionaries face in

learning how to improve life on a peasant farm.

### AIDING UNIVERSITY DEVELOPMENT IN CENTRAL AND EASTERN EUROPE

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Alliance of Universities for Democracy,  
East European Center,  
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A consortium of universities oriented to Central and Eastern Europe (CEE) has been developed. The Alliance of Universities for Democracy now includes 70 CEE institutions, one in Western Europe, and 25 in the United States; institutions from sixteen countries are included and range from the largest and oldest to smaller and newer institutions. Founded in Budapest at a Charter Conference in 1990, the Alliance held its Fifth Annual Conference in Prague last November; its Sixth will be in Budapest next November. Conferences always begin with sessions on human moral and social values and with talks typically by religious leaders. The agenda orients Rectors and Vice Rectors of CEE universities to the roles that universities should take in democracies, the necessity of sound ethical and religious foundations, and the need for science, engineering, and business educational reform.

Ranging from the rapid progress of the Czech Republic to the slow development of Slovakia and Romania, emerging Europe is changing rapidly and presents many opportunities to observe and contribute to the directions being chosen. The Alliance is a window for observing and a network for engaging in this process. Numerous U.S. institutions and particular CEE institutions have crafted their own individual cooperative programs that include student and faculty exchanges, joint educational programs, and development of research/service centers based on discussions originating at Alliance Conferences and participation in Alliance funded activities. Personal friendships have often developed into opportunities to interact closely with key faculty and administrative leaders of institutions both in CEE and U.S. institutions. Participation in Conferences and

Alliance Memberships is open to institutions and individuals. Examples of Alliances activities will be described.

### ENGINEERING ASSISTANCE TO DEVELOPMENT COUNTRIES

Allan E. Swartz, P. E.  
Engineering Consultant  
Muskegon, MI

Since the United States is far advanced in its automotive, technology, it is possible to give significant aid to development nations with a minimum of cost. Two trips were made abroad to bring automotive engineering assistance to improve progress in industrialization. The presentation describes these two assignments made as a volunteer.

In 1991 a six-week visit was made to the Escorts Company of Bangalore, India. The primary project was to improve the manufacturing process of large diameter piston rings used in diesel locomotive engines. While there, work was also done toward modernizing the designs of smaller automotive engine piston rings.

In 1994 a one-week visit was made to Prima Piston Ring Company of Lodz, Poland. In this case the assignment was to assist in the marketing of automotive piston rings. The replacement piston ring catalog was rewritten to make it understandable to the American engineers and mechanics.

Both trips were sponsored by the International Executive Service Corp. of Stamford, Connecticut. This is a not-for-profit organization supported by donations of individuals, corporations and the U.S. Government. It is the author's belief that this is a much better way of assisting developing countries than by giving much greater funds in direct foreign aid. Members of ASA, especially those who have retired from full time employment, are encouraged to be a part of this organization.

### CARING FOR SCIENCE UNDER FRIENDLY FIRE

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Mounting criticism of evolutionism within the ranks has begun to confront naturalistic presuppositions underlying the entire scientific enterprise. At issue is nothing less than the viability of science generally as well as the type of relationship enlightened Christians ought to have vis-a'-vis science in particular. In order to explore these central issues, it is necessary to penetrate well beyond the crucial evolutionism/evolution dichotomy. Both naturalistic evolution (evolutionism) and theistic evolution share in common the fact that each is grounded upon some heuristic belief structure or faith commitment. The issue is explicitly not one of science vs. faith! The crux is whether to believe in happenstance flukes lacking any design or, alternatively, to believe in the ongoing action of a creative Designer. Evidence is not faith-neutral. What the scientifically trained eye may see and interpret as random states that just happened to lock in at a high level of organization may, to the scientist of Christian persuasion, be seen as that -- yet as much more! Following the Coulson model, there is no reason why a Christian cannot be a dedicated practicing scientist provided he keep both eyes open; viz. follow the canons and methods prescribed by science, laden with its own inherent limitations, while remaining open to extended reality accessible primarily through the eyes of Christian faith.

One of the limitations inherent to science is a penchant for naturalistic reductionism. This is not considered a defect within science affecting the practice of science, which makes no pretence towards accessing extended reality. What science cannot legitimately do is set the parameters of possible reality to reflect its own restricted criterion of access. By the same token, it is not beneficial to practitioners of science, Christians or otherwise, to be confronted with innuendos suggesting that for science to be proper it must first in some sense be redeemed according to fundamentalist canons of interpretation. It is high time that Christians concerned with science realize, in the first instance, their collective need to undergo a thorough eye examination. (Lk 6: 41-42).

**PHYLLANTHUS AND HEPATITIS B: A CASE STUDY OF WHY  
IT'S HARD TO TRANSLATE ETHNOBOTANY INTO  
NATURAL PRODUCTS RESEARCH**

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St. Davids, PA

(Formerly: Research Associate, Fox Chase Cancer Center,  
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Many modern medicines derive from traditional practices. Phyllanthus, (Family Euphorbiaceae), a large genus with 550+ species in 11 subgenera), has many such records of use. Some are associated with certain subgenera, including usage as analgesics, antidiabetics or poisons. Herbs of the subgenus Phyllanthus have been extensively used to treat jaundice, and for this reason were tested for effects against hepatitis B virus (HBV). Aqueous extracts inhibited viral DNA polymerase (DNAP) of HBV and related viruses. Species were identified with the highest viral DNAP inhibition, and systems of cultivation and tissue culture were developed. However, animal trials and clinical trials done by a number of researchers failed to demonstrate reproducible effects on chronic virus infection. The data from ethnobotany, in vitro assays and clinical trials supports the presence of some type of biological activity, within the subgenus Phyllanthus. Alternative explanations include: (1) Effects exist against hepatitis virus(es) other than HBV; (2) There are "liver-protectant" but not antiviral effects; (3) The plants suppress disease hepatitis symptoms but are not antiviral; (4) The plants only possess psychosomatic effects. Research groups have identified anticancer compounds within subgenera Kirganelia and Conami, long known for toxicity. Other medical categories suggested possible leads for research, or possibly, herbal or galenic remedies.

**THE INTERNATIONAL MINISTRY OF THE INSTITUTE FOR  
CHRISTIAN STUDIES**

Robert E. VanderVennen  
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Toronto, Ontario, Canada

It is beautiful to see Christian scientists contribute their abilities overseas, especially in poor countries where the need is great and financial resources are few. But Christian institutions can also make a great contribution, in some ways reaching beyond what individuals can do.

The Institute for Christian Studies has found people in many parts of the world responding with interest in its ministry. The Institute's focus is on how to think Christianly about academic study and scientific research. It has found a tool in the Christian philosophy of Herman Dooyeweerd which calls for study which is foundational and interdisciplinary. This philosophy sets scientific work back on a Christian worldview and shows how one can undertake an inner Christian reformation of the sciences. The key for this is accepting God as creator of a universe of many kinds of unique but interrelated things.

People in underdeveloped and in western nations have been drawn to the Institute's books and academic papers. Many people from all over the world have come to Toronto to study and to attend conferences. They have returned home to set up literature distribution centers and study centers. The Institute's correspondence courses are also popular among people who do not have access to systematic Christian teaching. Institute faculty members have traveled to many of these places to give lectures and short courses.

## MAYBE THE BIBLE TEACHES EVOLUTION

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Our understanding of what the Bible says about how God created the world in Genesis 1 and 2 has been clouded by our culture, which generally pictures God's acts in the seven days of creation as being instantaneous. Yet the biblical text says that God commanded the water and the land to bring forth living creatures, statements that imply process taking place over a period of time.

Psalm 33 in verses 6 and 9 seems to say, however, that these acts were instantaneous. Christian writers through the centuries support this. John Milton, the text of Harden's Creation, C. S. Lewis' description of the creation in his Narnia stories, and our hymnody reinforce this

But there are significant parallels in Psalms 105 and 106 to Psalm 33. Comments on the ten plagues and the drying of the Red Sea in the psalms suggest these events were instantaneous, but Exodus describes a process taking many hours.

The words of Genesis 1 suggest a picture of creation that is compatible with an evolutionary picture of origins. But we must always keep clearly in mind the firm statements in Genesis that God has done it all, which leaves no room for atheistic evolution.

## DERIVING A BIBLICAL VIEW OF MICRO/MACRO MORPHOGENESIS (THE APPEARANCE OF BIOLOGICAL NOVELTY)

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The central issue in the Darwinism/creation debate is the meaning of "natural process". Writers of assorted world-views seem convinced that the

"natural processes" of reproduction and environmental pressure can act as a theory of the mechanism of life's development. Many of them seem to view that as a theory which opposes Divine action and/or design, while others seem to see no problem. The key issue is--natural cause. If the meaning of natural cause is deemed obvious, confusion results. Now if a Christian approach is important, logically one should first ask the Bible how it views the "the natural process of reproduction which we see today". And then, after setting a Biblical foundation, modern theory should be analyzed in its light. That is the plan of this paper.

## INSTANT CHINESE PUDDING

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A simple, inexpensive method has been developed for preparing a variety of instant puddings that are popular in China, including peanut, sesame, almond, walnut, red bean, and green pea. This labor-saving method has created new products, new business and new markets in Asia and America, as well as stimulated ideas for creating other new instant Oriental food products such as sauces, condiments, and beverages. This developmental work was done at the Chinese University of Hong Kong in part under the Fulbright foreign scholar exchange program. It demonstrates how Christians can find opportunities in helping people in other countries through science and technology.

## CULTURAL FORCES THAT CONTRIBUTE TO ENVIRONMENTAL DEGRADATION

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Human beings, as living creatures, not only are dependent on the environment for sustenance, but also impact the environment on which they depend. Human impact on the environment has become more extensive

both because of the increasing numbers of human beings and because of the technological developments through which human beings can have a greater potential impact. We are experiencing an increasing degradation of the very environment that supports human civilization and without which human civilization cannot exist. That is an obvious creaturely and creational given.

But the degradation of the environment is not a creational given. As human beings, we have the task and responsibility to care for the development God's creation such that it remains sustainable and productive so as to provide a dwelling for all of God's creatures and a place where all human beings can potentially live and serve the Lord.

This paper will explore and analyze some of the human cultural forces that appear to contribute to this degradation. One such force is the trend towards increasing concentration of ownership and economic power in the agriculture and food sector of society. Evidence tends to show that such concentration has a negative impact on the potential of all human beings to be able to exercise their responsibility as stewards of creation. The general policy of "get big or get out" concentrates stewardship into the hands of fewer people and at the same time limits the potential for many people to exercise stewardship. If this thesis that the concentration of economic power endangers sustainable food resources for many peoples and negatively impacts appropriate stewardship of the agroecosystem is correct, then we should recognize our collective and individual involvement in such concentrations of power. A potentially new force in that concentration can be expected from companies that engage in genetic engineering. Since altered forms of life can be patented, a new power, "gene power", may contribute to further concentrate control of food production.

Questions of global stewardship are not simply of theoretic interest for academic institutions. Academic institutions also participate in the economic forces that affect stewardship. To the extent, for example, that we invest huge amounts of monies in pension funds, we are undoubtedly contributing to the increasing concentration of economic power. In fact, we are indirectly owners of such economic powers through our endowment funds, pensions funds, savings, and investments. This presents a personal dilemma as well as an institutional dilemma. How can we work towards a greater integrity of theory and praxis of global stewardship both as institutions and as individuals?