

Schedule for Optional Field Trips

TUESDAY
August 4, 1992

6:00 to 7:00 AM - BREAKFAST (Courtyard)

Mauna Kea Observatory

6:20 AM to 3:30 PM 30 people maximum \$70

Waipi'o Valley

7:30 AM to 2:00 PM 15 people maximum \$30

Akaka Falls

1:00 PM to 5:00 PM 40 people maximum No cost

Volcano & Geothermal Plant

6:30 AM to 5:00 PM No limit \$10

6:00 to 7:00 PM - DINNER

WEDNESDAY
August 5, 1992

6:00 to 7:00 AM - BREAKFAST (Courtyard)

The conference officially ends Wednesday at lunch.

Volcano (Ecology & Geology)

7:00 AM to 5:30 PM No limit \$10

OTEC and WEST (Ocean & Wind Energy)

8:30 AM to 5:30 PM 30 people maximum No cost

Kealakekua Bay (Snorkeling)

11:00 AM to 5:00 PM 30 people maximum Under \$20

This trip will be led by Ken Dormer. *Cost is for mask, snorkel, fins and flotation device rental ... otherwise there is no cost. You can make equipment rental arrangements at several nearby shops.

See you next year in Seattle!

Looking to the Future And Across the Globe

*Where there is no vision, the people perish;
but he that keepeth the law, happy is he.*

Proverbs 29:18

47th ANNUAL MEETING

of the

American Scientific
Affiliation

UNIVERSITY
of the
NATIONS

Kailua-Kona, Hawaii

July 31 - August 5, 1992



Details, Details, Details...

Getting to the University of the Nations Campus

DRIVING TO THE U. OF N. CAMPUS FROM KEAHOLE AIRPORT (KONA): (About an 8 mile, 15 minute trip.)

Take Route 19 south from the airport to Palani Road. Turn right on Palani Road until you come to Route 11. Turn left on Route 11 and continue on it through town. About 1 mile outside of town you will see a sign for the U. of N. on the left-hand side of the road. Follow the signs to the campus, and then follow signs on campus to the GO Center.

SHUTTLE SERVICE: A new van service, SPEEDISHUTTLE, is now available. Call 808/329-5433 from the airport on arrival for door-to-door service. Cost is about \$8 per person. When you arrive at the University of the Nations, follow signs on campus to the GO Center. Call the shuttle service several days before you need to leave to make your reservations for pick-up to go back to the airport.

Contacting the University of the Nations

The phone number to use to contact the University of the Nations during the conference is 808/326-4455. (This is the phone number of the GO Center, a conference center on campus.)

The address is:

University of the Nations
GO Center
75-5851 Kuakini Highway
Kailua-Kona, HI 96740

Name Badges

You will receive a name badge with your registration packet. Please note that this badge is your pass into the various lectures and other activities of the conference — you will not be able to attend without it. You must return your name badge when you check out.

Meal Tickets

The Luau (Sunday evening dinner) is not included in the campus meal plans. If you did not sign up for the Luau, you will need to make your own arrangements for Sunday evening dinner.

Meal tickets are good only for the specific times listed on them. Please note that eight-meal plan tickets may not be used after lunch on Monday. Fourteen-meal plan tickets may not be used after lunch on Wednesday. You must return your meal ticket at the end of the conference.

The ASA extends thanks to
Program Chair, Tom Hoshiko, and
Local Arrangements Chair, Derek Chignell,
and to all those who have lent their support to make this
year's Annual Meeting possible.

1992 ASA Executive Council
Dr. Kenneth J. Dormer, President
Dr. Elizabeth Zipf, Vice President
Dr. Gerald Hess, Past President
Dr. Fred S. Hickernell, Secretary/Treasurer
Dr. Raymond Brand

ASA National Headquarters Staff
Dr. Robert L. Herrmann, Executive Director
Patricia Ames, Managing Editor
Frances C. Polischuk, Financial/Membership Manager
Carol G. Aiken, Executive Assistant

Editors

Dr. J.W. Haas, Jr., Editor, Perspectives on Science and
Christian Faith, the quarterly journal of the ASA
Dr. Richard Ruble, Book Review Editor, PSCF
Dr. Walter R. Hearn, Editor, ASA Newsletter (sent to
members 6/yr) & SEARCH (an occasional publication)
Patricia Ames, Managing Editor

More information about the American Scientific Affiliation can
be obtained at the literature table at the meeting or by writing
to the National Office:

American Scientific Affiliation
P. O. Box 668
Ipswich, MA 01938

FRIDAY July 31, 1992

1:00 to 4:00 PM	REGISTRATION at the GO Center Reception Area
&	University of the Nations Kailua-Kona, Hawaii
5:00 to 8:00 PM	
4:00 to 5:00	RECEPTION following registration, in the Courtyard
5:00 - 6:00	DINNER
6:00 to 6:20	Kenneth J. Dormer, Ph.D. Opening Aloha
Room 132	President, ASA
6:20 to 8:30	Howard V. Malmstadt, Ph.D. Relating Science and Technology to Global Missions
Room 132	Provost, U. of the Nations, Kailua-Kona, HI

SATURDAY
August 1, 1992

7 - 8 AM	BREAKFAST (Courtyard)	
8:00 to 8:45	DEVOTIONS in Room 132	
	Platform Sessions IA (Rm. 132)	Platform Sessions IB (Rm. 230)
8:45 to 9:05	<i>ASA and AISRED: Update & Opportunities</i> Kenneth J. Dormer, Ph.D. U. of Oklahoma Oklahoma City, OK	<i>Crisis in American Science Education: A Comparison with Japan</i> Stanley Rice, Ph.D. Huntington Col. Huntington, IN
9:05 to 9:25	<i>Opportunities in Hunger-Related Problems</i> Martin L. Price, Ph.D., ECHO Fort Myers, FL	<i>Origins as a Theme for Teaching a Liberal Arts Science Course</i> James A. Rynd, Ph.D., Biola U. La Mirada, CA
9:25 to 9:45	<i>Experiences in Hunger-Related Projects</i> Martin L. Price, Ph.D., ECHO Fort Myers, FL	<i>A Modified Course in Human Sexuality</i> David D. Cherney, Ph.D., Azusa Pacific U., Azusa, CA
9:45 to 10:05	<i>The Ethics of Future Human Genetic Intervention</i> James C. Peterson, Ph.D. Wingate Col. Wingate, NC	<i>Cooperative Learning as a Motivational Strategy</i> Paul D. Austin, Ph.D. & Lester C. Eddington, Ph.D., Azusa Pacific U., Azusa, CA
10:05 to 10:25	<i>A Christian Perspective on Global Warming</i> Donna F. Tucker, Ph.D., Creighton U. Omaha, NE	<i>Crisis in Amer. Education: Real or Imagined?</i> Gerald D. Hess, Ph.D., Messiah Col. Grantham, PA
10:25 to 10:45	<i>Regional Climate Change as a Consequence of Poor Stewardship</i> Jack C. Swearingen, Ph.D., Sandia National Labs. Livermore, CA	<i>Genesis I and the Photon Fireball</i> Robert L. Cooney, M.A., Los Angeles Valley Col. Van Nuys, CA
10:45 to 11:05	<i>Environmental Activism: A Christian Response</i> Ray M. Brand, Ph.D. Wheaton Col. Wheaton, IL	<i>The Future of Human Evolution</i> V. Elving Anderson, Ph.D., U. of Minn. Minneapolis, MN
11:05 to 11:25	<i>"How Green Should a Christian Be?"</i> K. John Kuhne, Ph.D. U. of the Nations Kailua-Kona, HI	<i>An Alternate Paradigm for Biological Origins</i> David L. Wilcox, Ph.D., Eastern Col. St. David's, PA

11:25 to 11:55	<i>Environmental Persp. of Faith & Tradition</i> Chi-Hang Lee, Ph.D., Del Monte Foods Co., Walnut Creek, CA, & Li-Yang Chang, Ph.D. Metcalf & Eddy, Inc. Redwood City, CA	<i>Evidence for an Alternate Paradigm</i> David L. Wilcox, Ph.D. Eastern Col. St. David's, PA
12 - 1 PM	LUNCH	
1:00 to 2:00	Room 132	Owen Gingerich, Ph.D. Templeton Lecture: <i>The Future of Physical Science — Ethical and Theological Implications</i> Senior Astronomer, Smithsonian Astrophysical Observatory and Professor of Astronomy and the History of Science, Harvard U.
2:00 to 3:00	Room 132	Robert L. Herrmann, Ph.D. Templeton Lecture: <i>The Future of Biological Science — Ethical and Theological Implications</i> Executive Director, ASA Adjunct Professor of Chemistry, Gordon Col.
3:00 - 3:15	BREAK (Courtyard)	
3:15 to 4:15	Room 132	Jay Hollman, M.D. <i>The Future of Medical Science — Ethical and Theological Implications</i> Director of Interventional Cardiology, Ochsner Clinic of Baton Rouge, Baton Rouge, LA
4:15 - 5:00	FREE TIME	
5:00 - 6:00	DINNER	
6:00 to 7:00	Room 132	Walter R. Hearn, Ph.D. <i>On Being A Christian In The Sciences</i> Editor, ASA Newsletter and SEARCH Berkeley, CA
7:00 to 8:30	Discussion Groups I To be announced	Posters I Second Floor Upper Foyer <i>A Course to Integrate Sci. & Faith</i> Karl W. Giberson, Ph.D., & Katherine B. Frederich, Ph.D. Eastern Nazarene Col. Quincy, MA <i>The "Gollum Syndrome" in Science's Popularization</i> Kenneth J. Carter, Jr., Ph.D. Northeast Missouri State U. Kirksville, MO <i>Taylor's Biology Senior Seminar</i> Andrew P. Whipple, Ph.D. Taylor U., Upland, IN <i>Pseudogenes and Human Evolution</i> Jim Behnke, Ph.D., Asbury Col. Wilmore, KY
8:30	VIDEOS in Room 132	

**SUNDAY
AUGUST 2, 1992**

8 - 9 AM	BREAKFAST (Courtyard)
<div style="border: 1px solid black; padding: 5px;"> Worship at the Mokuaikaua Church (The oldest church in Hawaii) or at other local churches </div>	
12 - 1 PM	LUNCH
1:00 to 2:00	<p align="center">Robert Kaita, Ph.D. <i>Obstacles and Opportunities for Christian Witness</i></p>
Room 132	Principal Research Physicist Plasma Physics Laboratory Princeton U., Princeton, NJ
2:00 to 3:00	<p align="center">Forrest L. Mims III <i>The Scientific American Affair: Responding to Religious Discrimination in the Workplace</i></p>
Room 132	Editor, <i>Science Probe</i> , Seguin, TX
3:00 to 3:15	BREAK (Courtyard)
3:15 to 4:15	ASA BUSINESS MEETING in Room 132
4:15 - 5:00	FREE TIME EDITORIAL BOARD ONLY: Editorial Board Meeting in Room 230, 4:15 - 5:30
5:00 to 9:00	<p align="center">LUAAU</p> at the King Kamehameha's Kona Beach Hotel Chance to pose for professionally taken luau photos from 5:00 - 6:00 PM.

**MONDAY
AUGUST 3, 1992**

7 - 8 AM	BREAKFAST (Courtyard)					
8:00 to 8:45	DEVOTIONS in Room 132					
8:45 to 10:10	<table border="1" style="width: 100%;"> <tr> <td rowspan="4" style="width: 15%; text-align: center;"> Discussion Groups II To be announced </td> <td align="center"> Posters II Second Floor Upper Foyer </td> </tr> <tr> <td> <i>Quantum Mechanics, Bell's Theorem, and Implications</i> Dillard Faries, Ph.D. Wheaton College, Wheaton, IL </td> </tr> <tr> <td> <i>Are Genesis 1 Days 24 Hour Days?</i> </td> </tr> <tr> <td> C. Gordon Winder, Ph.D. U. of Western Ontario London, Ontario, Canada </td> </tr> </table>	Discussion Groups II To be announced	Posters II Second Floor Upper Foyer	<i>Quantum Mechanics, Bell's Theorem, and Implications</i> Dillard Faries, Ph.D. Wheaton College, Wheaton, IL	<i>Are Genesis 1 Days 24 Hour Days?</i>	C. Gordon Winder, Ph.D. U. of Western Ontario London, Ontario, Canada
Discussion Groups II To be announced	Posters II Second Floor Upper Foyer					
	<i>Quantum Mechanics, Bell's Theorem, and Implications</i> Dillard Faries, Ph.D. Wheaton College, Wheaton, IL					
	<i>Are Genesis 1 Days 24 Hour Days?</i>					
	C. Gordon Winder, Ph.D. U. of Western Ontario London, Ontario, Canada					

10:10 to 10:20	BREAK	
	Platform Sessions IIA (Rm. 230)	Platform Sessions IIB (Rm. 132)
10:20 to 10:40 AM	<i>Supernature: At The Center of Science-Religion Tension</i> Paul Adams, Ph.D., U. of Michigan Flint, MI	<i>Beyond Rationalism, Individualism, & Tribalism: Redefining the Self in the Cosmos</i> Pablo Polischuk, Ph.D. Gordon Conwell Theological Seminary Wenham, MA
10:40 to 11:00	<i>Epic of Epochs & the Myth of Meaning</i> Larry Martin, Ph.D. North Park Col. Chicago, IL	<i>Metal Sources and Technology in the Biblical World</i> Edwin Yamauchi, Ph.D. Miami U. Oxford, OH
	Platform Session III (Rm. 132)	
11:00 to 12:00	<i>Science and Scientism in 21st Century Education</i> Phillip E. Johnson Jefferson E. Peyser Professor of Law U. of California, Berkeley, CA	
	<i>Special 1 Hour Lecture sponsored by the ASA Committee for Integrity in Science Education.</i>	
12 - 1 PM	LUNCH	
1:00 to 2:00	<p align="center">Mark D. Hartwig, Ph.D. <i>Science Education in the 21st Century</i></p>	
Room 132	Executive Director, Access Research Network, Colorado Springs, CO	
2:00 to 2:15	BREAK (Courtyard)	
2:15 to 3:00	DISCUSSION GROUP REPORTS in Room 132	
3:00 to 3:45	PANEL — FUTURE TASKS in Room 132	
3:45 to 5:00	AFFILIATION OF CHRISTIAN BIOLOGISTS' MEETING and AFFILIATION OF CHRISTIAN GEOLOGISTS' MEETING	
5:00 - 6:00	DINNER	
	FREE TIME or VIDEOS in Room 132	

PLEASE NOTE: Paper titles listed in this program are usually abbreviated due to space limitations. Please see the abstracts included in your registration packet (distributed when you arrive in Hawaii) for complete paper titles.



American Scientific Affiliation

FOR IMMEDIATE RELEASE

For further information, please contact:

Dr. Robert L. Herrmann, Executive Director
American Scientific Affiliation
P.O. Box 668
Ipswich, MA 01938 Tel. (508) 356-5656

Dr. Walter R. Hearn, Newsletter Editor
American Scientific Affiliation
762 Arlington Avenue
Berkeley, CA 94707 Tel. (510) 527-3056

SCIENTISTS LOOK TO THE FUTURE

IPSWICH, MA: "Looking to the Future and Across the Globe" is the theme of a unique meeting of scientists who profess the Christian faith, to be held at the University of the Nations, Kailua-Kona, Hawaii, from July 31 to August 5, 1992. This 47th Annual Meeting of the American Scientific Affiliation, headquartered in Ipswich, Massachusetts, will be sparked by two Templeton Lecturers as well as numerous other invited lecturers. Working scientists will examine the cross-currents of the veritable explosion of new research findings in conjunction with the mounting global problems of environment, population, education, and intolerance in the light of ethical and theological perspectives of historic Christianity. The Affiliation of Christian Biologists and the Affiliation of Christian Geologists will also be meeting.

Owen Gingerich, Ph.D., Senior Astrophysicist of the Harvard-Smithsonian Observatory, and Professor and Chairman of the Department of the History of Science, Harvard University, will present "The Future of Physical Science: Ethical and Theological Implications," a Templeton Lecture. Robert L. Herrmann, Ph.D., Adjunct Professor of Chemistry, Gordon College, Wenham, MA, and Executive Director of the American Scientific Affiliation will present "The Future of Biological Science: Ethical and Theological Implications," as a second Templeton Lecture. Jay Hollman, M.D., Director of Interventional Cardiology, Ochsner Clinic of Baton Rouge, Baton Rouge, LA will discuss "The Future of Medical Science: Ethical and Theological Implications."

"Relating Science and Technology to Global Missions" will be presented by Howard V. Malmstadt, Ph.D., Provost, University of the Nations and Emeritus Professor of Chemistry, University of Illinois. Provost Malmstadt is well known as an author and innovator in chemistry instrumentation and education. The topics of Christian witness in the sciences and religious discrimination in the workplace will be dealt with by Robert Kaita, Principal Research Physicist, Princeton University, and by Forest L. Mims, III, Editor, *Science Probe*, Seguin, TX, respectively. Prospects for science education in the 21st century is the topic that will be dealt in talks by Phillip E. Johnson, J.D., Professor of Law, University of California, Berkeley, and by Mark D. Hartwig, Ph.D., Executive Director, Access Research Network, Colorado Springs, CO. Walter R. Hearn, Ph.D., Editor of the ASA Newsletter and SEARCH, will talk "On Being a Christian in the Sciences." Numerous additional speakers will present reports on environmental, educational, biological, ecological, and theological issues.

**American Scientific Affiliation
Looking to the Future and Across the Globe
47th Annual Meeting July 31-August 3, 1992
University of the Nations, Kona, Hawaii**

As we await the start of a new century and of the third millennium, breathtaking advances in science and technology reopen profound theological and ethical issues. The failure of massive social experiments in this century and collapse of traditional values presage more changes in the human condition. To help us consider these issues, an array of speakers will present implications of recent and anticipated developments in the sciences.

INVITED SPEAKERS

Owen Gingerich, Ph.D.

Professor of Astronomy and of History of Science, Harvard University,
and Templeton Lecturer.

"The Future of Physical Science - Ethical and Theological Implications"

Robert L. Hermann, Ph.D.

Executive Director, American Scientific Affiliation, and Templeton Lecturer.

"The Future of Biological Science - Ethical and Theological Implications"

Jay Holman, M.D.

Director of Interventional Cardiology, Ochsner Clinic, Baton Rouge, LA.

"The Future of Medical Science - Ethical and Theological Implications"

Robert Kaita, Ph.D.

Principal Research Physicist, Plasma Physics Laboratory, Princeton University

"Obstacles and Opportunities in Science for Christian Witness"

Forrest L. Mims, B.A.

Editor, *Science Probe*, Seguin, Texas

"Science Writing: Challenge for Christian Witness"

Walter R. Hearn, Ph.D.

Editor, *ASA Newsletter*, Berkeley, California

"On Being A Christian In the Sciences"

Mark D. Hartwig, Ph.D.

Executive Director, Access Research Network, Colorado Springs, Colorado

"Science Education in the 21st Century"

Contributed Papers

Papers on the general theme and other issues are cordially invited. Deadline for receipt of abstracts is April 15, 1992.

For information on submission of abstracts, write:

AMERICAN SCIENTIFIC AFFILIATION

P.O.Box 668

Ipswich, MA 01938

(508) 356-5656

RELATING SCIENCE AND TECHNOLOGY TO GLOBAL MISSIONS

HOWARD V . MALMSTADT
UNIVERSITY OF THE NATIONS
KAILUA-KONA, HAWAII

WELCOME TO UNIVERSITY OF THE NATIONS, KONA CAMPUS! FIRST, I'VE BEEN ASKED BY YOUR PROGRAM CHAIRMAN TO SAY A FEW THINGS ABOUT MY PERSONAL TRANSITION IN 1978 FROM A WELL-KNOWN, RESEARCH-ORIENTED, HEAVILY-FUNDED UNIVERSITY TO WHAT WAS THEN ONLY A VISION. THE VISION IS FOR A MISSION-ORIENTED ALL-VOLUNTEER UNIVERSITY WHICH WOULD HAVE PROGRAMS RELATING TO EVERY AREA OF SOCIETY AND CULTURE. THE ENSUING YEARS OF SEEKING GUIDANCE AND DEVELOPMENT OF PROTOTYPE PROGRAMS AND WORLD WIDE NETWORK OF SCHOOLS ARE BRIEFLY REVIEWED. SOME CONCEPTS ARE ILLUSTRATED WITH SCIENCE AND TECHNOLOGY EXAMPLES. IT IS CERTAINLY TRUE THAT THOSE WITH PROFESSIONAL EXPERIENCE IN SCIENCE AND TECHNOLOGY HAVE UNIQUE OPPORTUNITIES TO COMMUNICATE THE GOOD NEWS IN WAYS THAT IMPACT MEET PEOPLE'S FELT NEEDS. IT IS SHOWN HOW THEIR ACTIONS SPEAK VOLUMES, AND CHANNELS ARE OPENED FOR THEM TO BE EFFECTIVE MISSIONARIES. SOME WAYS OF BECOMING INVOLVED "PART TIME" IN GLOBAL MISSIONS ARE CONSIDERED.

ASA AND AISRED
(THE AFRICAN INSTITUTE FOR SCIENTIFIC RESEARCH AND DEVELOPMENT)

KENNETH J. DORMER
UNIVERSITY OF OKLAHOMA
MEDICAL SCHOOL
OKLAHOMA CITY, OK

HUMAN TRAGEDY CONTINUES IN THE SUB-SAHARA REGION, ECONOMICALLY, POLITICALLY AND ENVIRONMENTALLY. SUDAN: TODAY A RADIO TRANSMISSION WAS RECEIVED FROM VILLAGE CHRISTIANS IN THE SOUTH, SURROUNDED BY ISLAMIC TROOPS AND FACING FATAL STARVATION. USING ACROSS RADIO THEY SAID GOOD-BYS TO FRIENDS AS THE VILLAGE WAS NOT EXPECTED TO SURVIVE. STARVATION IN THE SOUTH IS RAMPANT AS THE NORTHERN ISLAMIC GOVERNMENT, SUPPORTED BY IRAN, PROHIBITS ANY PRESS OR UN RESCUE TEAMS TO ENTER THE AREA. ETHIOPIA: THE EXODUS CONTINUES INTO KENYA AS THOUSANDS ENTER "FOOD" CAMPS, THEIR CROPS FAILED, ANIMALS EATEN, LIVELIHOOD ERASED. SOMALIA: RIVAL CLANS AMONG THE ONE TRIBE IN THIS COUNTRY FIGHT AMONG THEMSELVES. REFUGEES FLEE ON FOOT OR IN BOATS TOWARD THE KENYA BOARDER FOR FOOD AND SAFETY. ESTIMATES TODAY ARE THAT OVER 20 MILLION PEOPLE ARE AT RISK FOR STARVATION DEATH IN THIS REGION. KENYA: PERHAPS THE HOPE FOR FUTURE AFRICA YET BEREFT WITH ITS OWN POLITICAL CORRUPTION AND FOOD SHORTAGE (FOR 6 MONTHS NOW YOU CANNOT BUY MILK OR BUTTER IN THE STORES BECAUSE THE DROUGHT DRIED UP THE CATTLE). NEVERTHELESS, A FLEDGLING SCIENTIFIC RESEARCH ORGANIZATION HAS EMERGED, AISRED, WHICH SEEKS TO INCREASE CROP AND CATTLE PRODUCTION AND DECREASE THE INCIDENCE OF HUMAN PARASITIC DISEASE. UNIQUELY, AISRED WILL CONSIST OF AFRICAN SCIENTISTS WHO ARE COMMITTED CHRISTIANS, DEDICATED TO THEIR COUNTRIES OF KENYA, UGANDA AND TANZANIA AND HOPING TO SAVE LIVES WITH GOD'S GRACE AND THEIR SKILLS. AISRED'S MISSION IS TO SAVE LIVES CAUSED BY STARVATION AND DISEASE BY MAKING RESEARCH PROGRESS IN THE 3 ABOVE AREAS. POLITICALLY, THINGS ARE DRASTICALLY CHANGING NOW IN KENYA AS DICTATORIAL RULE IS ABATING AND EMERGENCE OF CHRISTIAN LEADERSHIP IS VERY IMPORTANT. THE U.S., ASA AND U.K. CHRISTIANS ON SCIENCE HAVE BEEN ASKED TO ASSIST AISRED WITH GUIDANCE, ACCOUNTABILITY, PRAYERS, SCIENTIFIC COLLABORATION AND SUPPORT. GRANT APPLICATIONS HAS BEEN SUBMITTED TO 13 FOUNDATIONS, KEY RESEARCH PROJECTS IDENTIFIED, BOARDS OF GOVERNORS AND OVERSEEING ELDERS APPROACHED. AT THE 2ND ANNUAL BOARD OF GOVERNORS MEETING 9-10 APRIL IN NAIROBI, GEORGE KINOTI, PH.D., DIRECTOR, CONVEYED HIS WARM GREETINGS IN THE LORD AND SINCERE APPRECIATION TO THE MEMBERS OF ASA FOR THEIR SUPPORT DURING AISRED'S INITIAL 10 MONTHS. LITERALLY HUNDREDS OF THOUSANDS OF LIVES MAY BE SAVED THROUGH THE RESEARCH EFFORTS OF AISRED, ASA AND CIS AND THE LORD WILL BE BLESSED.

CRISIS IN AMERICAN SCIENCE EDUCATION:
A COMPARISON WITH JAPAN

STANLEY RICE
HUNTINGTON COLLEGE
HUNTINGTON, IN

NUMEROUS RECENT STUDIES HAVE INDICATED THAT AMERICAN HIGH SCHOOL GRADUATES TODAY HAVE LESS MASTERY OF ACADEMIC SUBJECTS THAN GRADUATES A COUPLE OF DECADES AGO. THE DECLINE IN PERFORMANCE IS PERHAPS MOST NOTICEABLE IN SCIENCE AND GEOGRAPHY. MOREOVER, AMERICAN HIGH SCHOOL GRADUATES SCORE LOWER THAN GRADUATES FROM PRACTICALLY EVERY OTHER INDUSTRIALIZED COUNTRY ON SCIENCE TESTS.

THIS CONSTITUTES A CRISIS FOR INTERNAL AND EXTERNAL REASONS. INTERNALLY: ENVIRONMENTAL PROBLEMS ARE BECOMING SO MASSIVE SO RAPIDLY, THAT SCIENCE LITERACY IS ESSENTIAL. EXTERNALLY: THE FAILURE OF STUDENTS TO UNDERSTAND SCIENCE WILL CONTINUE TO CONTRIBUTE TO AMERICAN'S ECONOMIC DECLINE RELATIVE TO OTHER INDUSTRIALIZED COUNTRIES.

IN RESPONSE TO THIS SITUATION, MANY EDUCATORS TEND TO BLAME EITHER THEMSELVES OR THE GOVERNMENT. SOME EDUCATORS CLAIM THAT AMERICAN STUDENTS ARE BEING "TURNED OFF" BY THE POOR QUALITY OF INSTRUCTION IN THE CLASSROOM, PARTICULARLY BY INSTRUCTORS WHO USE TEACHING METHODS WHICH EDUCATIONAL RESEARCHERS CONSIDER OUTMODED. OTHERS CITE AN INSUFFICIENCY OF GOVERNMENT FUNDING. FOR INSTANCE, A JANUARY 1992 NSF REPORT CALLED FOR INCREASED FEDERAL FUNDING FOR CREATIVE AND DISCOVERY-ORIENTED TEACHING.

HOWEVER, I INTEND TO DEMONSTRATE THAT, WHILE THERE IS ROOM FOR IMPROVEMENT, THERE IS NOTHING DESPERATELY WRONG WITH THE INSTRUCTION ASPECT OF AMERICAN EDUCATION. THE PROBLEM IS NOT WITH THE TEACHERS, IT IS WITH THE STUDENTS. TO ILLUSTRATE THIS, I WILL PRESENT FIRST-HAND INFORMATION ABOUT JAPANESE SECONDARY SCIENCE EDUCATION, WHICH USES TECHNIQUES AMERICAN TEACHER-EDUCATORS CONSIDER HORRENDOUS, YET WHICH PRODUCES EXCELLENT STUDENTS, PRIMARILY BECAUSE OF STUDENT MOTIVATION.

A VARIETY OF EXPLANATIONS CAN BE OFFERED FOR THE LOW AVERAGE LEVEL OF STUDENT MOTIVATION IN SECONDARY AND COLLEGIATE SCIENCE CLASSROOMS; FOR INSTANCE, THE EFFECTS OF TELEVISION (ON ATTENTION SPAN AND ON INFORMATION OVERLOAD), INATTENTIVE OR HYPOCRITICAL PARENTS, OR EVEN (ACCORDING TO SOME OBSERVERS) A POOR UNDERSTANDING OF THE NATURE OF OBJECTIVE TRUTH. BUT WHATEVER THE INTERACTING SET OF EXPLANATIONS MAY TURN OUT TO BE, IT IS UNLIKELY THAT DOWNWARD-DIRECTED PROGRAMS, WHETHER GENERATED BY EDUCATORS OR BY THE GOVERNMENT, CAN REVERSE THE SITUATION. INSTEAD AN UPWARD-DIRECTED REGENERATION, IN WHICH STUDENTS AND THEIR PARENTS VALUE EDUCATION, IS NEEDED, AND THE CRISIS WILL PERSIST UNTIL THIS SOCIAL AND SPIRITUAL TRANSFORMATION TAKES PLACE.

OPPORTUNITIES FOR ASA MEMBERS IN HUNGER-RELATED PROBLEMS

MARTIN PRICE
 EXECUTIVE DIRECTOR
 EDUCATIONAL CONCERNS FOR HUNGER ORGANIZATION
 (ECHO)

BASED ON WHAT I HAVE SEEN DURING 23 YEARS AS A MEMBER OF ASA, OUR PRIMARY AREA OF MINISTRY IS TO PROVIDE A PERSPECTIVE AND CRITIQUE IN THE AREAS WHERE SCIENCE AND THEOLOGY INTERFACE. THIS INCLUDES APOLOGETICS IN THE SCIENCE VS CHRISTIANITY DEBATE, DISCUSSION OF ISSUES RELATED TO ORIGINS OF LIFE AND THE UNIVERSE, AND PERSPECTIVE ON MORAL QUESTIONS ARISING AS SCIENCE IMPACTS SOCIETY.

AS IMPORTANT AS THESE AREAS ARE, THERE IS ANOTHER MAJOR AREA IN WHICH ASA COULD PROVIDE LEADERSHIP (AND RECRUIT MEMBERS). THAT IS TO PROMOTE ACTIVE PARTICIPATION IN RESEARCH AND IMPLEMENTATION IN AREAS RELATED TO HUNGER. I PREDICT IT WOULD BRING A NEW LEVEL OF EXCITEMENT FOR OUR MINISTRY AMONG BOTH STUDENTS AND FACULTY. FOR EXAMPLE, I HAVE ALWAYS BEEN STRUCK BY THE ALMOST TOTAL LACK OF ASA MEMBERSHIP FROM THE SCHOOLS OF AGRICULTURE IN OUR COUNTRY. YET THESE SCHOOLS OFTEN SEEM TO HAVE AN UNUSUALLY HIGH NUMBER OF CHRISTIANS ON THE FACULTY AND IN THE STUDENT BODY. WE NEED TO INCLUDE THEIR AREAS OF MINISTRY AS WELL AS OPEN NEW OPPORTUNITIES WITHIN THE "HARD SCIENCES."

THE INVOLVEMENT OF ASA IN THE FLEDGLING AGRICULTURAL AND MEDICAL RESEARCH CENTER IN KENYA IS A GREAT START. THE BULK OF THIS TALK WILL DEAL WITH SPECIFIC HUNGER-RELATED RESEARCH PROJECTS WHICH MIGHT BE UNDERTAKEN BY ASA MEMBERS WITH NO AGRICULTURAL BACKGROUND IN THEIR BIOLOGY OR CHEMISTRY LABORATORIES. EXAMPLES INCLUDE THE FOLLOWING AND MORE:

CAN THE GLIRICIDIA TREE BE USED TO CONTROL RATS? MANY SOCIETIES REPORT THAT THIS TREE CAN BE USED IN THIS WAY. STORIES DIFFER, SOME USING THE BARK, SOME THE LEAVES AND OTHERS THE SEEDS, ALL PREPARED IN DIFFERENT WAYS. ONE RESEARCH ARTICLE SHOWED THAT UPON FERMENTATION THE LEAVES DO PRODUCE DICOUMAROL, A POWERFUL RAT POISON. NO RESEARCH HAS TRIED TO BRING THIS TO THE LEVEL OF A RELIABLE RECIPE FOR HOME-MADE POISON FOR USE BY PEASANT FARMERS.

IS THE VELVET BEAN SAFE TO EAT UNDER FAMINE CONDITIONS? THIS VIGOROUS GREEN MANURE CROP IS QUICKLY CATCHING ON AS AN INTERCROP WITH CORN. MISSIONARIES HAVE REPORTED DOUBLE AND EVEN TRIPLE YIELDS OF CORN INTERCROPPED WITH THE BEAN. IT ALSO PRODUCES A GOOD TASTING, HIGH PROTEIN BEAN EVEN DURING DRY WEATHER. BUT IT CONTAINS UP TO 5% DOPA, THE BASE PRODUCT FOR TREATING PARKINSON'S DISEASE. A BIOLOGY PROFESSOR AND A CHEMISTRY PROFESSOR AT TWO CHRISTIAN COLLEGES ARE LOOKING INTO THE QUESTION AND HOPEFULLY WILL PROVIDE GUIDANCE AS TO WHETHER WE SHOULD RECOMMEND THAT PEOPLE EAT THE BEANS, HOW DIFFERENT METHODS OF PREPARATION AFFECT DOPA LEVELS, WHETHER SOME VARIETIES ARE BETTER THAN OTHERS IN THIS REGARD, ETC.

DEVELOP INFORMATION TO ENABLE REASONABLE "PRESCRIPTIONS" OF PLANTS FOR MEDICAL OR VETERINARIAN USE WHERE MEDICINES CANNOT BE PURCHASED. MOST RESEARCH IS DESIGNED TO DISCOVER A DRUG THAT CAN BE EXTRACTED OR SYNTHESIZED. SCIENCE DOES NOT USUALLY PROVIDE MUCH ADVICE FOR THE MISSIONARY OR NATIONAL WHO MUST PRESCRIBE PLANTS (FOR MALARIAL CONTROL OR DE-WORMING AS TWO EXAMPLES).

ORIGINS AS A THEME FOR TEACHING
A LIBERAL ARTS SCIENCE COURSE

JAMES RYND
PROFESSOR OF CHEMISTRY
BIOLA UNIVERSITY, LA MIRADA, CA

COLLEGIATE CURRICULUM TYPICALLY REQUIRE A GENERAL EDUCATION SCIENCE COURSE. THE PURPOSE OF SUCH A COURSE IS TO PROVIDE THE STUDENT A BASIS FOR UNDERSTANDING THE NATURE OF SCIENCE THROUGH A STUDY OF ITS HISTORY, GOALS, ASSUMPTIONS AND METHODOLOGY. SPECIFIC SUBJECT AREAS ONLY SERVE TO ILLUSTRATE THESE PRINCIPLES. AN IMPORTANT OBJECTIVE FOR THE STUDENT IS THE ABILITY TO DISTINGUISH BETWEEN DIRECT OBSERVATION, CORRELATION, EXTRAPOLATION, INFERENCE AND THEORETICAL CONSTRUCTS.

THE STUDY OF ORIGINS SERVES AS AN EXCELLENT THEME FOR SUCH A COURSE. THE FORMATIVE HISTORY OF THE UNIVERSE TIES TOGETHER MOST ALL THE NATURAL SCIENCE DISCIPLINES. THE OBVIOUS PHILOSOPHICAL AND THEOLOGICAL IMPLICATIONS AS WELL AS ITS CONTROVERSIAL NATURE CAN MOTIVATE STUDENTS WHO ARE NOT OTHERWISE INTERESTED IN THE SCIENCES.

SUCH A COURSE HAS BEEN TAUGHT AT BIOLA FOR A NUMBER OF YEARS. COURSE STRUCTURE, TEXTS AND READING MATERIAL, RESOURCES, TEACHING METHODS AND STUDENT EVALUATION TOOLS WILL BE DISCUSSED.

**"ONE ORGANIZATION'S EXPERIENCE IN USING SCIENCE
TO HELP MISSIONARIES AND OTHER DEVELOPMENT
WORKERS HAVE MORE EFFECTIVE HUNGER-RELATED PROJECTS"**

MARTIN PRICE
EXECUTIVE DIRECTOR

FOR OVER TEN YEARS I (AND MORE RECENTLY SEVERAL OTHER STAFF) HAVE SPENT FULL TIME HELPING MISSIONARIES AND OTHER NON-PROFIT ORGANIZATIONS AS THEY SEEK TO HELP PEASANT FARMERS AND URBAN GARDENERS GROW FOOD. ECHO'S NETWORK EXTENDS TO 2700 PEOPLE IN 110 COUNTRIES. WE ARE IN DAILY COMMUNICATION WITH INDIVIDUAL MEMBERS OF OUR NETWORK THROUGH PERSONAL CORRESPONDENCE, VISITS TO ECHO BY SCORES OF MISSIONARIES AND OCCASIONAL TRIPS OF OUR OWN -- ADVISING, CONSULTING, ANSWERING QUESTIONS, ENCOURAGING, AND SUGGESTING NEW PLANTS OR TECHNIQUES TO TRY. THIS HAS GIVEN US A UNIQUE OPPORTUNITY TO SEE THE RANGE OF PROBLEMS ENCOUNTERED AS WELL AS TO IDENTIFY WAYS THAT WE AS SCIENTISTS CAN HELP.

MISSIONARIES AS A RULE ARE INVOLVED IN "MICRO-DEVELOPMENT." WHEREAS A GOVERNMENT AGENCY MIGHT BE CALLED UPON TO SOLVE THE FOOD PROBLEMS OF AN ENTIRE COUNTRY (MACRO- DEVELOPMENT), THE MISSIONARY SEEKS TO IMPACT THE LIVES OF PARTICULAR INDIVIDUALS IN A PARTICULAR COMMUNITY.

ALTHOUGH A GREAT MANY MISSIONS ARE INVOLVED IN MEDICAL WORK, A RELATIVELY SMALL NUMBER UNDERTAKE AGRICULTURAL PROJECTS. WHY IS THIS? MANY RECOGNIZE THAT MEAGER INCOMES FROM FARMING AND POOR NUTRITION ARE OFTEN THE ROOT CAUSE OF THE MEDICAL PROBLEMS THEY FACE. WHEN AN INDIVIDUAL IS ILL, A TRAINED DOCTOR USUALLY KNOWS HOW TO TREAT THE ILLNESS. IT IS MUCH LESS CLEAR WHAT TO DO WHEN AN ENTIRE COMMUNITY IS "ILL" BECAUSE OF INADEQUATELY PRODUCTIVE FARMS. I SUGGEST THAT FEWER MISSIONS UNDERTAKE AGRICULTURAL WORK BECAUSE THEY DO NOT KNOW HOW TO PROCEED.

GOD HAS IMBUEH HIS CREATION WITH AN AMAZING ARRAY OF PLANTS AND ANIMALS THAT ARE ESPECIALLY USEFUL IN SUCH SITUATIONS. MUCH SUFFERING IS BECAUSE WE DO NOT PAY SUFFICIENT ATTENTION TO THE WEALTH HE HAS CREATED, AND TECHNIQUES FOR MANAGING THAT WEALTH.

ANYTHING NEW NEEDS TO EVALUATED CAREFULLY BEFORE TAKING THE RISK OF ENCOURAGING FARMERS TO SWITCH TO IT. ECHO ENCOURAGES MISSIONARIES TO BECOME THEIR OWN EXPERIMENTERS USING A CONCEPT WHICH WE CALL SMALL FARM RESOURCE DEVELOPMENT PROJECTS (SFRDP).

IN THIS SLIDE ILLUSTRATED TALK, TWO SFRDP'S JUST STARTING (IN THE BRAZILIAN

**ETHICS AND THE FUTURE OF HUMAN GENETIC INTERVENTION:
IS THE INCREASINGLY INFLUENTIAL DISTINCTION BETWEEN CURE AND
ENHANCEMENT, BOTH WORKABLE AND DESIRABLE?**

JAMES C. PETERSON, PH. D.
ASSISTANT PROFESSOR OF THEOLOGY AND ETHICS,
AND DIRECTOR OF THE PROGRAM
IN RELIGION, ETHICS, AND TECHNOLOGY
WINGATE COLLEGE, WINGATE, NC

**A MODIFIED BIOLOGY COURSE IN HUMAN SEXUALITY
THAT MEETS NEW CONTEMPORARY G.E. CRITERIA**

DR. DAVID D. CHERNEY
AZUSA PACIFIC UNIVERSITY
AZUSA, CALIFORNIA 91702

COLLEGES AND SMALL UNIVERSITIES, ESPECIALLY THOSE OF CHRISTIAN ORIENTATION, SHOULD BE AGGRESSIVELY PROACTIVE IN PROVIDING STUDENTS WITH A HOLISTIC, HIGH LEVEL OF UNDERSTANDING OF THEIR SEXUALITY. THIS SHOULD BE DONE BEFORE THEY JOIN THE WORK FORCE WITHIN OUR PLURALISTIC SOCIETY THAT MANY BELIEVE IS IN THE FINAL STAGES OF CULTURAL AND MORAL DECAY.

THE COURSE, "GENDER DIFFERENCES", REFLECTS THIS SELF-IMPOSED MANDATE AND WAS ALSO DESIGNED TO MEET A GENERAL EDUCATION SCIENCE REQUIREMENT. AT THE SAME TIME, THE COURSE INTEGRATES SEVERAL THEMES IN ORDER TO QUALIFY AS PART OF OUR NEW G.E. STUDIES INTEGRATED CURRICULUM. THE CONTENT OF "GENDER DIFFERENCES" REFLECTS THE FOLLOWING INTEGRATIONS:

1. THE CHRISTIAN WORLD VIEW OF GENDER DIFFERENCES COMBINES BIBLICAL PERSPECTIVES WITH NON-BIBLICAL INFORMATION TO GIVE ONE A STRONG BASIS FOR UNDERSTANDING HIS/HER OWN GENDER IDENTITY AND GENDER ROLE IN CONTEMPORARY SOCIETY. ARE THERE ANY COMMONALITIES AND/OR ABSOLUTES WHICH TRANSCEND CULTURE?
2. LIBERAL ARTS - THIS COURSE IS TAUGHT FROM A HOLISTIC VIEWPOINT BY GIVING STUDENTS A VIEW OF THEMSELVES FROM THEIR BEGINNING AS A BIOLOGICALLY-DETERMINED ORGANISM AND HOW THAT VIEW (GENDER IDENTITY) IS SHAPED BY OTHER FORCES. THESE INCLUDE SOCIOLOGICAL, PSYCHOLOGICAL, THEOLOGICAL AND SCIENTIFIC FORCES, THUS FORMING ONE'S GENDER ROLE.
3. INTERCULTURAL PERSPECTIVE - GENDER DIFFERENCES ARE EXAMINED IN LIGHT OF SEVERAL DIFFERENT CULTURES IN ORDER TO OBSERVE THE EXTENT TO WHICH ONE'S SEXUALITY IS INFLUENCED BY ONE'S MICRO- AND MACRO-ENVIRONMENTS.
4. WRITING AND CRITICAL THINKING- ARE INTEGRAL PARTS OF THIS COURSE AS EACH STUDENT IS FIRST GIVEN A BASE OF RATIONAL INFORMATION AND MUST USE THIS TO REACT TO SITUATION-ETHICS PROBLEMS POSED IN DISCUSSION, IN WRITTEN EXAMS AND IN A FINAL THEME PAPER.
5. BIOLOGICAL SCIENCE - LABORATORY EXERCISES AND TEXTBOOK LEARNING COVER MANY "HARD SCIENCE" TOPICS IN GENDER DIFFERENCES INCLUDING GENETICS, HORMONES, CHARACTERISTICS OF LIFE, GROWTH, DIFFERENTIATION, DEVELOPMENT, ANATOMY, PHYSIOLOGY, LABORATORY RESEARCH/EXPERIMENTATION, MICROBIOLOGY, MORBIDITY AND MORTALITY.

ETHICS AND THE FUTURE OF HUMAN GENETIC INTERVENTION:
IS THE INCREASINGLY INFLUENTIAL DISTINCTION BETWEEN CURE AND
ENHANCEMENT, BOTH WORKABLE AND DESIRABLE?

JAMES C. PETERSON, PH. D.
ASSISTANT PROFESSOR OF THEOLOGY AND ETHICS,
AND DIRECTOR OF THE PROGRAM
IN RELIGION, ETHICS, AND TECHNOLOGY
WINGATE COLLEGE, WINGATE, NC

THE DISTINCTION BETWEEN CURE OF DISEASE AND ENHANCEMENT OF CAPACITY IS THOUGHTFULLY AND INCREASINGLY ADVOCATED AS THE BORDER BETWEEN ACCEPTABLE AND UNACCEPTABLE GENETIC INTERVENTION IN HUMAN BEINGS. IT IS NOTEWORTHY THAT MANY OF THOSE WHO PROPOSE THIS LINE, WHETHER FOR GENETIC INTERVENTION OR OTHER INTERVENTIONS SUCH AS THE USE OF HUMAN GROWTH HORMONE, ACKNOWLEDGE THE DIFFICULTY OF MAKING IT PRECISE. OTHERS REJECT THE DISTINCTION FOR THIS VERY REASON, PARTICULARLY OUT OF CONCERN FOR A "SLIPPERY SLOPE" EFFECT. A FIRST ACCEPTABLE STEP MAY LEAD TO UNACCEPTABLE CHOICES. WHETHER THERE IS A CLEAR CONCEPTUAL DISTINCTION BETWEEN CURE OF DISEASE AND ENHANCEMENT OF CAPACITY IS ESSENTIAL TO RESPONDING TO SLIPPERY SLOPE ARGUMENTS AND FOR ANY ACTUAL APPLICATION. THIS PAPER ADDRESSES THE CONTROVERSIAL DEFINITIONS OF CURE AND ENHANCEMENT, TO ESTABLISH IF THE DISTINCTION BETWEEN THEM IS VIABLE, AND CONCLUDES THAT THE DISTINCTION IS WORKABLE AS A METHOD OF PRIORITIZATION FOR ASSIGNING RISK AND BENEFIT, IF THE LIKELY EXPANSION OVER TIME IN WHAT CURE OF DISEASE INCLUDES, IS ACCEPTABLE.

WITH THE ABOVE IN HAND, FOUR KEY QUESTIONS THAT THE DISTINCTION WOULD HAVE TO ADDRESS, WILL BE RAISED WITH RESPONSE AS TIME AND INTEREST PERMITS. 1) WHAT DO WE OWE TO FUTURE GENERATIONS? 2) IS THE ORIGIN, NATURE, AND CAPACITY OF BEING HUMAN PHYSICALLY STATIC OR DYNAMIC? 3) IF SUCH INTERVENTION TAKES PLACE, HOW WOULD IT AFFECT OUR ATTITUDES AND EXPECTATIONS? 4) WHO WOULD DECIDE THE DEGREE AND NATURE OF SUCH INTERVENTIONS?

COOPERATIVE LEARNING AS A MOTIVATIONAL STRATEGY FOR
CHRISTIAN COLLEGE SCIENCE STUDENTS

PAUL D. AUSTIN AND LESTER C. EDDINGTON
DEPARTMENT OF BIOLOGY
AZUSA PACIFIC UNIVERSITY
AZUSA, CA 91702

A MODEL OF COOPERATIVE LEARNING WAS DESIGNED AND IMPLEMENTED IN AN UPPER-DIVISION CELL AND MOLECULAR BIOLOGY COURSE. SEVERAL LEARNING AND MOTIVATIONALLY BASED PROBLEMS CONFRONTING A LARGELY CHRISTIAN, PREMEDICAL CAREER-ORIENTATED GROUP OF STUDENTS WERE IDENTIFIED. TO ADDRESS THESE PROBLEMS A COOPERATIVE LEARNING STRATEGY WAS IMPLEMENTED. THIS CONSISTED OF THE USE OF MOTIVATIONAL PASSAGES FOUND IN SCRIPTURE USED BY ACADEMIC SUPPORT GROUPS WHICH MET AT REGULAR INTERVALS THROUGHOUT THE SEMESTER. ELEMENTS OF GROUP PROCESSING SUCH AS PRE- AND POST-TESTING, EVALUATIONS, USE OF A STAFF FACILITATOR, LECTURE PROBLEMS, AND DISCUSSION QUESTIONS, ALL SERVED TO PROMOTE DIRECTION AND REINFORCEMENT FOR THE GROUPS DURING THE DURATION OF THE COURSE. FINAL EVALUATIONS HAVE INDICATED POSITIVE CONSEQUENCES FROM SELECTING A COOPERATIVE LEARNING STRATEGY IN THE FOLLOWING AREAS: COURSE GRADE SUCCESS, FORMATION OF FRIENDSHIPS, REDUCTION IN PROCRASTINATION BEHAVIOR, INDIVIDUAL ACCOUNTABILITY, CONSOLIDATION OF LEARNING STYLES AND STUDY SKILLS, AND MAINTENANCE OF CAREER ORIENTATION.

10.

A CHRISTIAN PERSPECTIVE ON GLOBAL WARMING

DONNA F. TUCKER
DEPARTMENT OF ATMOSPHERIC SCIENCES
INSTITUTE FOR ENVIRONMENTAL STUDIES
CREIGHTON UNIVERSITY
OMAHA, NE

SOME SECULAR AUTHORS HAVE CLAIMED THAT A CHRISTIAN MINDSET IS THE ROOT CAUSE OF OUR ENVIRONMENTAL PROBLEMS. CARL SAGAN HAS REITERATED THESE ARGUMENTS IN SEVERAL RECENT ARTICLES WHILE ASKING FOR SUPPORT FROM THE RELIGIOUS COMMUNITY TO COMBAT OUR CURRENT ENVIRONMENTAL DIFFICULTIES. IN CONTRAST I CLAIM THAT IT IS DISRESPECT FOR THE CREATOR WHICH HAS LED TO THE DISRESPECT OF CREATION.

BASED ON THIS PREMISE I EXAMINE THE SCIENTIFIC EVIDENCE FOR AND AGAINST GLOBAL WARMING. POSSIBLE MODES OF RESPONSE ARE OUTLINED. I ALSO BRIEFLY MENTION THE SOCIAL AND ECONOMIC CONSEQUENCES OF REDUCTIONS IN GREENHOUSE GAS EMISSIONS.

INCREASING GREENHOUSE GAS CONCENTRATIONS IN THE ATMOSPHERE ARE SEEN AS A SYMPTOM OF A MORE SERIOUS DISEASE - I.E. THE MISUSE OF OUR ENVIRONMENT. CONTINUED EMPHASIS ON THE SYMPTOM RATHER THAN THE DISEASE ITSELF WILL NOT LEAD TO ANY OVERALL BENEFIT. A CHRISTIAN VIEW OF CREATION AS A GIFT OF GOD WHICH IS TO BE PRESERVED SUPPORTS A GOAL OF NONABUSE OF THE ENVIRONMENT.

CRISIS IN AMERICAN EDUCATION -- REAL OR IMAGINED?

GERALD D. HESS
MESSIAH COLLEGE
GRANTHAM, PA

SCHOOLS HAVE BECOME THE "WHIPPING BOY" FOR THE PERCEIVED FAILURES OF AMERICAN SOCIETY. AN AFFLUENT SOCIETY, ALBEIT FRAUGHT WITH POVERTY, ILLITERACY/ INNUMERACY, DRUG ABUSE AND OTHER PROBLEMS CONTINUES TO BLAME THE PUBLIC SCHOOLS. TO BE SURE THE SCHOOLS NEED IMPROVEMENT, BUT IN MANY WAYS NOT THE CAUSE OF SOCIETY'S PROBLEMS.

SOME SCHOOLS--PARTICULARLY THOSE IN ECONOMICALLY DEPRESSED REGIONS OF OUR CULTURE--NEED TO RECEIVE THE SUPPORT THAT WILL ALLOW FOR LARGE-SCALE IMPROVEMENTS. EARLIER IN THIS CENTURY, CHRISTIAN MISSIONARY TEACHERS PROVIDED EDUCATION FOR MANY IN DEVELOPING COUNTRIES. TODAY'S MISSION FIELD IS THE INNER CITY. WILL CHRISTIANS RESPOND TO THE CHALLENGE? THE NEED FOR IMPROVED INSTRUCTION IN SCIENCE, MATH AND WRITING IS PARTICULARLY ACUTE.

GENERALLY SPEAKING, THE PUBLIC SCHOOL SYSTEM IN AMERICA IS STRONGER THAN THE MEDIA WOULD HAVE US BELIEVE. THE QUEST TO MAKE A HIGH SCHOOL DIPLOMA AVAILABLE TO EVERYONE HAS RESULTED IN LOWERED EXPECTATIONS, PARTICULARLY AT THE HIGH SCHOOL LEVEL. THE RIGOR OF AMERICAN HIGH SCHOOL AND COLLEGE EDUCATION NEEDS TO BE INCREASED. IN ADDITION, MORE EMPHASIS ON CONNECTING "REAL LIFE" APPLICATIONS TO TEXTBOOK LEARNING IS NEEDED.

SOME HIGH SCHOOL STUDENTS CHOOSE THE LEAST DIFFICULT CURRICULUM BECAUSE THEY PERCEIVE FORMAL EDUCATION TO BE IRRELEVANT AND/OR IMPOSSIBLE. IT IS THIS GROUP, MORE THAN ANY OTHER, THAT IS RESPONSIBLE FOR THE "BAD PRESS" PUBLIC EDUCATION IN GENERAL AND TEACHERS IN PARTICULAR HAVE BEEN RECEIVING. FOR THOSE WHO COULD ACHIEVE BUT CHOOSE NOT TO, NEW CURRICULA THAT APPEAL TO THEIR INTERESTS AND ABILITY LEVELS NEED TO BE DEVELOPED. FOR THE TRULY NON-ACADEMICS IN SOCIETY, APPROPRIATE ALTERNATIVE PROGRAMS MUST BE DEVELOPED. NONE OF THIS CAN HAPPEN WITHOUT THE STRONG SUPPORT OF SOCIETY AND OF PARENTS.

REGIONAL CLIMATE CHANGE
AS A CONSEQUENCE OF POOR STEWARDSHIP

JACK C. SWEARENGEN
LIVERMORE, CA

THE SUGGESTION IS BEING MADE, FROM AN ENVIRONMENTALIST PERSPECTIVE, THAT THE EARTH'S HUMAN POPULATION IS APPROACHING THE CARRYING CAPACITY OF THE PLANET. ALTHOUGH THIS THESIS MAY BE ARGUABLE ON A GLOBAL SCALE, IT IS INDISPUTABLE FOR CERTAIN REGIONS. GLOBAL EFFECTS OF HUMAN ACTIVITY INCLUDE GLOBAL WARMING, OZONE DEPLETION, AND EXTINCTION OF SPECIES; REGIONAL EFFECTS USUALLY ARE TAKEN TO MEAN SOIL, WATER, AND AIR POLLUTION. REGIONAL CLIMATIC CHANGES RESULTING FROM URBANIZATION ARE KNOWN TO OCCUR, BUT ARE NOT OFTEN MENTIONED AS A SIGNIFICANT ENVIRONMENTAL PROBLEM. THE PROTRACTED (SIX YEAR) DROUGHT IN CALIFORNIA, FOR EXAMPLE, IS INTERESTING TO CONSIDER AS POSSIBLY RESULTING FROM THE COMBINED EFFECTS OF GLOBAL WARMING AND REGIONAL URBANIZATION ON A MASSIVE SCALE.

THE PROPHETS TAUGHT THAT POOR STEWARDSHIP WOULD BRING ENVIRONMENTAL CONSEQUENCES, AND ALSO THAT GOD WOULD USE THESE CONSEQUENCES TO CHASTEN ISRAEL. THE RATE AT WHICH WASTE HEAT IS RELEASED TO THE BIOSPHERE OVER LARGE REGIONS OF CALIFORNIA NOW APPROACHES A SIGNIFICANT FRACTION OF THE SOLAR FLUX, AND AS A RESULT, ENVIRONMENTAL EFFECTS MAY BE ANTICIPATED. CALIFORNIA IS BY NO MEANS A COVENANT STATE; HOWEVER, MASSIVE URBANIZATION WITHOUT DUE REGARD FOR ENERGY BALANCE IS ANOTHER EXAMPLE OF POOR STEWARDSHIP. SHOULD GOD BE ASKED TO INTERVENE AND DEFRAY THE NATURAL CONSEQUENCES?

GENESIS 1 AND THE PHOTON FIREBALL

ROBERT L. COONEY
 PROFESSOR EMERITUS - GEOLOGY AND ASTRONOMY
 LOS ANGELES VALLEY COLLEGE
 VAN NUYS, CA

FOR INTRODUCTORY PURPOSES, THIS PAPER GIVES A VERY BRIEF REVIEW OF THE HISTORY OF TODAY'S PREVAILING VIEW OF COSMOGENESIS, THE STANDARD BIG BANG THEORY, AND DEMONSTRATES THAT THERE IS A STRONG RELATIONSHIP BETWEEN THE NOTIONS DEVELOPED IN THE MOST UP-TO-DATE BIG BANG SCENARIO AND THE CONCEPTS PUT FORWARD IN GENESIS 1:1-4. THE VEHICLE USED IN THIS PAPER IS A COMPARISON OF ELEVEN POINTS OF AGREEMENT BETWEEN THE TWO SCENARIOS. ELEVEN TERMS OR PHRASES FROM THE SCRIPTURES CAN BE SHOWN TO TIE THE CONCEPTS OF 3500 YEARS GO TO THE CONCEPTS DEVELOPED IN THE STANDARD BIG BANG MECHANISMS WITH AN AMAZING ACCURACY. IT IS SHOWN FOR EXAMPLE, THAT THE PHOTON FIREBALL HAS AN EQUIVALENCY IN "LET THERE BE LIGHT", AND THIS EQUIVALENCY IS BACKED UP BY STATEMENTS OF HEBREW SCHOLARS OF MANY YEARS AGO. THE TERMS "HEAVEN AND EARTH" ARE ALSO FOUND TO HAVE A CORRESPONDENCE TO ASTROPHYSICAL CONCEPTS. FOR EXAMPLE, IT IS CLEAR FROM EARLY HEBREW WRITINGS THAT "ERETS" IS A TERM THAT TELLS US OF THE PRIMORDIAL SUBSTANCE OF THE UNIVERSE. WE ALSO SEE THE OLD THEOLOGICAL PROBLEM OF THE TWO HEAVENS, "SHAMAYIM" AND "RAQUIYA" RESOLVED. THE SAME EARLY HEBREW SCHOLARS SHED A GREAT DEAL OF LIGHT ON THE "GAP" AND "TOHUW WAW BOHUW". WE SEE THAT MODERN COSMOLOGY HELPS US TO LAY THE "GAP" THEORY TO REST (WITHOUT A GAP) AND THAT THE "EARTH" WAS NEVER A "RUIN", NOR WAS IT EVER RECONSTITUTED. THE EARLY CREATION PICTURE OF A DARK PRIMORDIAL FLUID (NOT WATERS) EMERGES OUT OF BOTH SCRIPTURAL AND COSMOLOGICAL DETAILS, COMPLETE WITH DARKNESS AND CHAOS THROUGHOUT THE DEPTHS OF A PRIMORDIAL FIREBALL. THE MAJOR CORRESPONDENCE OR CONGRUENCY DEMONSTRATED IN THIS PAPER IS THE PROPOSITION THAT "LET THERE BE LIGHT" IS THE INITIATION OF THE GREAT PHOTON FIREBALL OF MODERN ASTROPHYSICAL THOUGHT. THE OLD PROBLEM OF "LIGHT BEFORE LIGHTS" IS THEREBY DISPOSED OF, AND THE ASTROPHYSICISTS TELL US THAT THE FIREBALL WAS PERFECT IN EVERY DETAIL ("AND GOD SAW THE LIGHT--THAT IT WAS GOOD"). THE DECOUPLING OF PHOTONS FROM DARK MATTER AT THE END OF THE FIREBALL PHASE FINDS EXPRESSION IN GENESIS 1:4 AS GOD'S SEPARATION (DECOUPLING) OF LIGHT FROM DARKNESS, A PHENOMENON EXPLAINABLE ONLY BY MEANS OF AN ASTROPHYSICAL CONCEPT. IT ANSWERS THE PUZZLING QUESTION: WHAT DO LIGHT AND DARKNESS LOOK LIKE BEFORE THEY WERE SEPARATED -- WHAT DOES THIS MEAN? THE CONTRIBUTIONS IN THIS PAPER ARE BACKED UP BY STATEMENTS FROM HEBREW SCHOLARS WHO HAVE GIVEN INTERPRETATIONS OF TERMS WHICH TEND TO CLARIFY AND AMPLIFY ALREADY EXISTING SCRIPTURAL CONCEPTS. WHO, BETTER THAN HEBREW SCHOLARS VERSED IN ANCIENT HEBREW CAN GIVE US PROPER EXPLANATIONS OF HEBREW TERMS? IT IS THESE TERMS THAT FIND THEIR WAY INTO CORRESPONDENCE WITH MODERN ASTROPHYSICAL THINKING.

ENVIRONMENTAL ACTIVISM: A CHRISTIAN RESPONSE

RAYMOND H. BRAND
WHEATON COLLEGE
WHEATON, IL

THE INCREASED NUMBER AND GROWTH OF ENVIRONMENTAL ORGANIZATIONS SINCE THE FIRST EARTH DAY OF 1969 HAS BEEN BOTH GRATIFYING AND FRUSTRATING TO THOSE CONCERNED WITH THE CARE OF THE EARTH. GRATIFYING, SINCE THE INTEREST AND INVOLVEMENT OF MANY PERSONS IN THE ENVIRONMENTAL MOVEMENT BODES WELL FOR THE FUTURE OF THE GLOBE. FRUSTRATING, SINCE LIMITED FUNDS IN A TIGHT ECONOMIC CLIMATE BRINGS ABOUT TOUGH COMPETITIVE MARKETING, AND POTENTIAL CONTRIBUTORS OF TIME, MONEY, AND OTHER FORMS OF SUPPORT ARE BEWILDERED BY THE DIVERSITY OF THE GROUPS SEEKING THEIR COMMITMENT.

IN THIS PAPER, A NUMBER OF ENVIRONMENTAL ORGANIZATIONS (E.G. GREENPEACE, SIERRA CLUB, THE NATURE CONSERVANCY, AUDUBON, ENVIRONMENTAL DEFENSE FUND, EARTH FIRST, ETC.) WILL BE COMPARED. THE HISTORY, GOALS, PUBLICATIONS, AND METHODS USED TO PROMOTE THE ORGANIZATION WILL BE REVIEWED. IN PARTICULAR, AN ASSESSMENT WILL BE MADE OF ANY PRACTICES USED WHICH ARE OUT OF HARMONY WITH THE ETHICAL PRINCIPLES AND GUIDELINES SET FORTH IN THE BIBLE. IT IS HOPED THAT THE INFORMATION PRESENTED AND THE OPINIONS EXPRESSED WILL GUIDE THOSE LISTENING TO A MORE THOUGHTFUL DISCRIMINATION AMONG WORTHY ENVIRONMENTAL GROUPS, AS WELL AS TO SUGGEST DISASSOCIATION WITH GROUPS INSENSITIVE TO BASIC CHRISTIAN VALUES.

TIME CONSTRAINTS OF THE ORAL PAPER MAY LIMIT THE NUMBER OF ORGANIZATIONS THAT CAN BE INCLUDED. A MORE COMPLETE MANUSCRIPT WILL BE SUBMITTED FOR LATER PUBLICATION IN THE ASA JOURNAL.

THE FUTURE OF HUMAN EVOLUTION

V. ELVING ANDERSON
PROF. EMERITUS OF GENETICS
UNIVERSITY OF MINNESOTA

PRECISE PREDICTIONS OF THE FUTURE ARE IMPOSSIBLE, BUT THE MAJOR MECHANISMS AND THE ASSOCIATED RATES OF CHANGE CAN BE DESCRIBED. THIS WILL HELP US TO RECOGNIZE MISPERCEPTIONS AND UNJUSTIFIED FEARS ON THE ONE HAND AND AREAS OF LEGITIMATE CONCERN ON THE OTHER.

AT ANY POINT IN TIME THERE IS A BALANCE BETWEEN SELECTIVE FORCES AND RATES OF MUTATION. IMPROVED MEDICAL TREATMENT OF GENETIC DISEASES MAY LEAD TO RELAXED SELECTION (INCREASED REPRODUCTION BY THOSE AFFECTED) AND THUS TO A SLOW INCREASE IN THEIR FREQUENCY. VOLUNTARY DECISIONS TO WITHHOLD REPRODUCTION WILL HAVE THE REVERSE EFFECT. THE SPREAD OF DELETERIOUS CHEMICALS IN THE ENVIRONMENT IS PROBABLY INCREASING THE RATE OF MUTATIONS, BUT DIRECT MEASUREMENT OF THE CHEMICALS OR MUTATIONS IS DIFFICULT.

CHANGES IN POPULATION MOBILITY AND IN INTER-ETHNIC MATING WILL AFFECT GENE COMBINATIONS BUT NOT GENE FREQUENCIES. THERE IS NO EVIDENCE, HOWEVER, THAT RACIAL ADMIXTURE IS HARMFUL OR LEADS TO SIGNIFICANT IMPROVEMENT IN HEALTH. FURTHERMORE, GENETIC ARGUMENTS HAVE NO PLACE IN SETTING IMMIGRATION POLICY.

THE POSSIBLE CONSEQUENCES OF THE HUMAN GENOME PROJECT AND OF GENETIC ENGINEERING DESERVE SPECIAL ATTENTION. IMPROVED METHODS FOR DIAGNOSIS OF GENETIC PROBLEMS AND FOR DETECTION OF SUSCEPTIBILITIES CAN AID RESPONSIBLE FAMILY PLANNING. GENE INSERTION THERAPY THAT AVOIDS THE GERMS LINE, OF COURSE, WILL AFFECT ONLY THE INDIVIDUALS WHO ARE TREATED. ANY ADDITION OF DNA INTO CHROMOSOMES WILL BE TREATED AS A NEW MUTATION AND BECOME SUBJECT TO NATURAL SELECTION.

THE EFFECTS OF NUCLEAR ACCIDENTS (OR WARFARE) WILL BE SEEN IN THE HEALTH AND DEVELOPMENT OF THOSE DIRECTLY INVOLVED. THE CHILDREN OF SURVIVORS PROBABLY WILL CARRY AN ADDED MUTATION LOAD, BUT ANY INCREASE IN DISEASE MAY BE HARD TO DETECT.

AS CHRISTIAN STEWARDS WE MUST KEEP ABREAST OF SUCH DEVELOPMENTS AND HELP TO REDUCE POTENTIAL HARM. ON THE OTHER HAND, WE MUST GUARD AGAINST GOVERNMENT REGULATIONS OR SOCIAL POLICIES THAT CONSTRAIN PERSONAL FREEDOMS. GROWING KNOWLEDGE AND POWER BRING AWESOME RESPONSIBILITIES.

"HOW GREEN SHOULD A CHRISTIAN BE?"

DR. JOHN KUHNE
UNIVERSITY OF THE NATIONS
KONA, HAWAII

THE "ENVIRONMENTAL MOVEMENT" IS PERHAPS THE MOST SIGNIFICANT ISSUE TO HAVE GALVANIZED A GLOBAL CONSCIOUSNESS AND PRESSURE FOR UNIFIED ACTION IN THIS CENTURY. CERTAINLY IT IS THE ISSUE WHICH HAS THE ATTENTION OF ALMOST EVERY SECTION OF SOCIETY AT THE PRESENT. TRUE TO THE PATTERN OF RESPONSE TO CHANGES IN WORLDVIEW OBSERVED BY FRANCIS SCHAEFFER, THE CHRISTIANS ARE AS USUAL THE LAST TO RESPOND. CONSEQUENTLY, THEY ENTER THE PICTURE AT A POINT WHERE OTHER GROUPS HAVE ALREADY GAINED MOMENTUM FOR THEIR POSITIONS, AND WITH THE EMOTIONAL DYNAMIC WHICH THE ENVIRONMENTAL ISSUES PROVOKE, IT IS OFTEN DIFFICULT FOR CHRISTIANS TO SEE THE ISSUES CLEARLY ENOUGH TO RESPOND WITH A BIBLICAL WORLDVIEW: TO KNOW JUST HOW GREEN THEY SHOULD BE!

THE MASS OF SCIENTIFIC EVIDENCE WHICH IS ACCUMULATING - EVEN THOUGH SOMETIMES DISPUTED - CLEARLY POINTS TO A SERIOUS DETERIORATION IN BOTH THE QUANTITIES AND THE QUALITY OF THE RESOURCES THAT ARE PRESENT IN THE WORLD WE LIVE IN. THE IMPACT OF THESE CHANGES, WHICH MAY BE LIMITED TO LOCAL AREAS, SUCH AS POLLUTION OF THE WATER SUPPLY TO A TOWN, OR MAY HAVE WIDER RAMIFICATIONS, SUCH AS THE ACID RAIN WHICH DRIFTS ACROSS INTERNATIONAL BORDERS, HAS SERIOUS IMPLICATIONS FOR THE HEALTH AND WELLBEING OF NOT ONLY PEOPLE, BUT FOR THE WHOLE OF GOD'S CREATION. OF PARTICULAR CONCERN FROM THE WORLD PERSPECTIVE ARE THE CONTENTIOUS ISSUES OF GLOBAL WARMING AND THE DAMAGE TO THE OZONE LAYER.

THE NEW "SAVIOR" OF THE WORLD WILL BE THE ONE WHO CAN RESOLVE THESE ISSUES, AND BRING THE EARTH TO A PLACE OF SUSTAINABILITY. TWO CANDIDATES EMERGE: THE "TECHNOTHEISTS", WHO BELIEVE THAT TECHNOLOGY WILL ALWAYS BE ABLE TO COME UP WITH AN ANSWER; AND AN INCREASINGLY MILITANT GROUP OF "NEW AGER'S", WHO PRESENT A DECEPTIVELY APPEALING MYSTICAL RELIGION AS THEIR ANSWER.

HOW GREEN THEN, SHOULD CHRISTIANS BE? RADICALLY GREEN - NOT BECAUSE WE FEAR FOR THE FUTURE OF THE WORLD, BUT BECAUSE WE UNDERSTAND THAT THE REAL ISSUE IS SIN: THE VIOLATION OF CREATION BY MAN (IS 24: 4,5) AND THAT WE BELIEVE "THAT THE CREATION ITSELF WILL BE LIBERATED FROM ITS BONDAGE TO DECAY AND BROUGHT INTO THE GLORIOUS FREEDOM OF THE CHILDREN OF GOD." (ROM 8:21) - SHARING THE FREEDOM FROM SIN WHICH WAS PURCHASED ON CALVARY'S CROSS; AND BECAUSE WE BELIEVE THAT AS THE APPOINTED STEWARDS OF GOD'S CREATION WE HAVE SINNED IN NOT BEING FAITHFUL STEWARDS, AND NEED TO MAKE RESTITUTION; AND BECAUSE WE CARE FOR THE CREATION BECAUSE IT IS HIS; SO THAT, AS WE TAKE THE MESSAGE OF THE KINGDOM OF GOD TO THE NATIONS, WE PREACH AND MODEL A GOSPEL OF HOPE AND HEALING FOR ALL THAT GOD CREATED AND SAID "...IT IS GOOD".

AN ALTERNATE PARADIGM FOR BIOLOGICAL ORIGINS

DAVID L. WILCOX
EASTERN COLLEGE
ST. DAVID'S, PA

THE NEO-DARWINIAN PARADIGM FOR THE PRODUCTION OF BIOLOGICAL NOVELTY HAS PROVED INADEQUATE TO PREDICT THE APPEARANCE OF NOVELTY AND THE PATTERN OF CHANGE IN THE FOSSIL RECORD. THIS IS DUE TO AN SIMPLISTIC "BEAN-BAG" MODEL OF GENOMIC ORGANIZATION. THE CYBERNETIC REALITY OF HOMEOSTATIC AND HOMEORHYTHIC SYSTEMS REQUIRES A CYBERNETIC MODEL OF GENETIC CONTROL. BUT, IF THAT BE TRUE, THE GENOME CONTAINS SEVERAL CLASSES OF INFORMATION, ONLY ONE OF WHICH SELECTION THEORY HAS BEEN TESTED ON, OR IS ADEQUATE TO EXPLAIN. THUS, A NEW PRINCIPLE FOR THE APPEARANCE OF NOVELTY IS REQUIRED. THE QUESTION IS WHETHER UNDIRECTED NATURAL SYSTEMS WOULD BE CAPABLE OF SUCH PROCESSES, OR IF THEY REQUIRE MAKING EXPLICIT THE DIRECTIVE PRESENCE OF THE SIGHTED WATCHMAKER.

**AN ENVIRONMENTAL PERSPECTIVE OF FAITH AND TRADITION
A REVIEW OF CHINESE ORGANIC FARMING SYSTEM**

CHI-HANG LEE
DEL MONTE FOODS COMPANY
WALNUT CREEK, CA

LI-YANG CHANG
METCALF & EDDY, INC.
REDWOOD CITY, CA 94065

DISRUPTION OF THE ENVIRONMENT IS A RESULT OF SINFULNESS. CHRISTIANS MUST VIEW NATURE, WILDERNESS, AND LIFE IN THE LIGHT OF BIBLICAL DOCTRINES OF CREATION, SIN, SALVATION, AND REDEMPTION. ALTHOUGH MANY HAVE SHOWN CONCERN FOR THE ECOLOGICAL CRISIS BY REDUCING CONSUMPTION, DEVELOPING NEW TECHNOLOGIES TO CLEAN UP POLLUTED SITES, AND MODIFYING INDUSTRIAL PRODUCTION PROCESSES, "RECONSTRUCTION" HAS BEEN GIVEN LESS ATTENTION. BY RECONSTRUCTION WE MEAN THE RESTORATION OF RELATIONSHIP BETWEEN HUMANS AND GOD'S CREATION. A FIVE-STEP PROCEDURE, INCLUDING AWARENESS, REPENTANCE, RESPECT, REDUCTION, AND RECONSTRUCTION (A4R) MAY BE PROPOSED FOR CONSIDERATION.

CHINESE AGRICULTURAL PRACTICE IS ONE OF MANY TRADITIONS FROM WHICH WE MIGHT LEARN SOMETHING ABOUT GOD'S CREATION AND HUMAN STEWARDSHIP. PROTESTANT MISSION WORK BEGAN IN CHINA MORE THAT 150 YEARS AGO. ALONG WITH THE GOSPEL ALSO CAME DIFFERENT FACETS OF WESTERN CULTURE, BRINGING IN SCIENCE AND TECHNOLOGY, MACHINERY, MODERN WEAPONS, MASS MEDIA, ROCK MUSIC, FAST FOOD, ETC.. MUCH OF TRADITIONAL CHINESE LIFE STYLE, INCLUDING ORGANIC FARMING, IS BEING CHANGED BY THE STRONG WAVE OF WESTERN CULTURE.

WHAT WAS THE CHINESE ORGANIC FARMING SYSTEM? CAN WE LEARN SOME LESSONS FROM IT? HOW DO WE INTERPERT THE TRADITION IN A CHRISTIAN PERSPECTIVE? AN ATTEMPT WILL BE MADE TO REVIEW THE INCREASINGLY ABANDONED TRADITIONAL CHINESE AGRICULTURAL PRACTICES IN RELATION TO OUR CHRISTIAN STEWARDSHIP.

EVIDENCE FOR AN ALTERNATIVE PARADIGM
FOR BIOLOGICAL ORIGINS

DAVID L. WILCOX
EASTERN COLLEGE
ST. DAVID'S, PA

THE MODEL OF A CYBERNETICALLY ORGANIZED GENOME IS SUPPORTED BY EVIDENCE FROM A NUMBER OF DIFFERENT BIOLOGICAL AREAS. IN THIS PAPER, I WILL SURVEY SUCH EVIDENCE FROM DEVELOPMENTAL BIOLOGY (INDIVIDUATION FORMATION), HOMOLGY (SHARED INDIVIDUATED ENTITY), SPECIATION (COHESION MODELS), MUTATION (FUNCTION DEFINITION, AND AS SEARCH PROCESSES), MORPHOLOGICAL STASIS, TYPE FORM APPEARANCE (FOSSIL RECORD), MOSAIC EVOLUTION (FOSSILS) AND THE STRUCTURE OF ADAPTIVE RADIATIONS. IN EACH CASE, THE SIMPLEST MODEL IS OF AN INFORMATION RICH GENOME ORGANIZED CYBERNETICALLY, A GENOME WHICH WILL RESPOND TO SELECTION IN AN NON-DARWINIAN FASHION.

20.

THE FUTURE OF PHYSICAL SCIENCE

OWEN GINGERICH
HARVARD-SMITHSONIAN CENTER FOR ASTROPHYSICS

PAST EXPERIENCE WITH PREDICTING THE FUTURE OF SCIENCE HAS REPEATEDLY DEMONSTRATED A CLOUDY CRYSTAL BALL, "AN EXERCISE IN HUMILITY" AS ONE PHYSICIST RECENTLY PUT IT. NEVERTHELESS, THERE ARE CERTAIN PROBLEMS THAT SEEM RIPE FOR SOLUTION IN THE NEXT DECADE OR TWO: THE DISCOVERY OF THE TOP QUARK IN PHYSICS, HOW INHOMOGENEITIES IN THE STRUCTURE OF THE UNIVERSE (GALAXIES AND THEIR SPATIAL DISTRIBUTION) APPEAR AFTER AN ASTONISHINGLY HOMOGENEOUS BEGINNING (REFLECTED BY THE SMOOTHNESS OF THE BACKGROUND RADIATION) IN ASTRONOMY, HOW THE SHAPES OF MOLECULES AFFECT THEIR CHEMICAL FUNCTIONS. THE SOLUTION OF SEVERAL OF THESE PROBLEMS REQUIRE EXTREMELY COMPLEX EQUIPMENT, WHOSE EXPENSES WERE READILY JUSTIFIED IN A CLIMATE OF INTERNATIONAL COMPETITION. NOTE THAT IN 1990 THE FEDERAL BUDGET FOR ASTRONOMY AND ASTROPHYSICS ALLOCATED TWICE THE COMBINED TOTAL OF THE NATIONAL ENDOWMENT FOR THE ARTS AND THE NATIONAL ENDOWMENT FOR THE HUMANITIES. CAN SCIENTISTS MORALLY CONTINUE TO CLAIM SUCH ALLOWANCES?

IN MAKING PREDICTIONS OF THE NEXT THIRTY YEARS OF SCIENCE, WE MUST BE AWARE THAT THE SCENARIO WILL BE PLAYED OUT AGAINST A SOCIAL BACKDROP THAT INCLUDES THE "DOOMSDAY EQUATION," WHICH PREDICTS THAT THE WORLD POPULATION WILL BECOME INFINITE IN THE YEAR 2025. ALTHOUGH THE EQUATION MUST NECESSARILY BE WRONG, SOCIAL CONDITIONS WILL CHANGE RADICALLY IN THE NEXT FEW DECADES. AS CHRISTIANS AND AS SCIENTISTS WE MUST PONDER BOTH PERSONAL AND NATIONAL PRIORITIES FOR THE COMING CENTURY.

THE FUTURE OF BIOLOGICAL SCIENCE
ETHICAL AND THEOLOGICAL IMPLICATIONS

ROBERT L. HERRMANN, PH.D.
AMERICAN SCIENTIFIC AFFILIATION
IPSWICH, MA.

THE BIOLOGICAL SCIENCES SEEM TO BE MOVING RAPIDLY TOWARD A NEW DEFINITION OF HUMAN BEINGS IN TERMS OF NEUROBIOLOGY, MODERN ANTHROPOLOGY AND MOLECULAR GENETICS. THE HUMAN BRAIN, THE MOST COMPLEX MATERIAL OBJECT WE KNOW OF IN THE UNIVERSE, IS BEING STUDIED BY A VAST ARRAY OF NEUROSCIENTISTS WHO, TOGETHER WITH COGNITIVE AND BEHAVIORAL SCIENTISTS, WILL BRING SOME STARTLING CONCLUSIONS ABOUT WHO WE ARE, HOW WE PROCESS AND STORE THE EQUIVALENT OF 5 SETS OF ENCYCLOPEDIA BRITANNICA IN A LIFETIME AND WHAT DISTINGUISHES THE MIND FROM THE BRAIN. ANTHROPOLOGISTS CONTINUE TO DEVELOP INCREASINGLY SOPHISTICATED TECHNIQUES FOR TRACING OUR ANCESTRY, AND THE SURPRISING OUT-OF-AFRICA HYPOTHESIS FOR THE ORIGIN OF MODERN HUMANS WILL PROBABLY BE CORROBORATED AND EXTENDED, AS BETTER DATA ON MIGRATION PATTERNS AND MUTATION RATES IS OBTAINED.

EVOLUTIONARY BIOLOGISTS WILL CONTINUE TO PROVIDE DATA FOR A MUCH MORE COMPLEX MODEL FOR EVOLUTION, WITH MORE AND MORE EVIDENCE ACCUMULATING THAT ENVIRONMENTAL FACTORS AND BUILT-IN CONSTRAINTS HAVE PLAYED A SIGNIFICANT ROLE IN EARLY EVOLUTION. THE EVOLUTIONARY MODEL WILL BE SO AFFECTED BY INPUT FROM MOLECULAR AND ESPECIALLY DEVELOPMENTAL GENETICS THAT IT WILL BE VIRTUALLY REDEFINED AS "DEVELOPMENTAL SYNTHESIS."

OUR KNOWLEDGE OF HUMAN GENETICS WILL BE MULTIPLIED IN THE NEXT FEW DECADES AS THE MULTI-BILLION DOLLAR PROJECT FOR SEQUENCING THE ENTIRE HUMAN GENOME COMES TO FRUITION. THE NEW DATA WILL REVEAL A PLETHORA OF GENETIC VARIATIONS WITHIN THE HUMAN POPULATION, SOME OF WHICH HAVE SUBTLE CONSEQUENCES FOR HUMAN HEALTH. FOR EXAMPLE, SO CALLED "CONTINGENT GENETIC DISEASES", WHICH ARE EXPRESSED ONLY LATER IN LIFE WITH A SEVERITY DEPENDENT UPON ENVIRONMENTAL FACTORS SUCH AS STRESS AND NUTRITION, WILL PROVIDE A NEW INCENTIVE FOR NURTURE AND IMPROVED LIFE-STYLES.

THE AGGREGATE OF THESE ENORMOUS CHANGES IN SCIENTIFIC KNOWLEDGE OF OURSELVES, REVEALING FAR MORE SUBTLY AND COMPLEXITY IN THE HUMAN EQUATION, WILL PROVIDE OPPORTUNITY FOR FRESH THEOLOGICAL INSIGHTS AND HOPEFULLY A RENEWED INTEREST ON THE PART OF SCIENTISTS IN RELIGIOUS VALUES AND THE SPIRITUAL NATURE OF HUMAN BEINGS.

FUTURE ETHICAL ISSUES IN MEDICAL SCIENCE

JAY HOLLMAN, M.D.
OCHSNER CLINIC OF BATON ROUGE
BATON ROUGE, LOUISIANA

ETHICAL ISSUES ASSOCIATED WITH THE END OF LIFE WILL CAUSE INCREASED CONFLICTS. SIMPLISTIC ANSWERS SUCH AS ALWAYS DO EVERYTHING TO PRESERVE LIFE WILL NOT BE SUFFICIENT. EUTHANASIA IS BEST DIVIDED INTO FOUR PARADIGMS: 1) ACTIVE, VOLUNTARY, 2) ACTIVE, INVOLUNTARY, 3) PASSIVE, VOLUNTARY, 4) PASSIVE, INVOLUNTARY. THE FIRST MODIFIER REFERS TO THE PHYSICIAN'S ROLE AND THE SECOND TO THE PATIENT'S DESIRES. THEOLOGICAL DISCUSSIONS CAN BE GREATLY HELPED BY A SCIENTIFIC UNDERSTANDING OF THE AGING PROCESS, BRAIN DEATH AND CHRONIC VEGETATIVE STATE.

FETAL TRANSPLANT, IF IT PROVES SUCCESSFUL, CREATES PROBLEMS WITH REGARD TO THE SOURCE OF THE TISSUE. TISSUE OBTAINED FROM SPONTANEOUS ABORTION HAS A HIGH PROBABILITY OF CHROMOSOMAL ABNORMALITIES AND IS CERTAINLY DIFFICULT TO OBTAIN. TISSUES FROM ABORTION ON DEMAND COULD BE AN UNACCEPTABLE SOURCE FOR THE CHRISTIAN. ALTERNATIVE TECHNOLOGY FROM TISSUE CULTURES MIGHT GIVE THE THERAPEUTIC BENEFIT WITHOUT THE USE OF FETAL TISSUE.

MENTAL HEALTH AND SPIRITUALITY CLASH AT NUMEROUS INTERFACES: 1) IS HOMOSEXUALITY A SIN, A DISEASE OR THE RESULT OF STRUCTURAL CHANGES IN THE BRAIN? 2) IS ADOLESCENT MISBEHAVIOR A RESULT OF LEARNING DISABILITY, CHEMICAL IMBALANCE IN THE BRAIN, ATTENTION DEFICIT SYNDROME OR SIN? 3) DOES THE USE OF MOOD ALTERING DRUGS, SUCH AS ANTIDEPRESSANTS AND ANTIPSYCHOTICS, UNDER THE DIRECTION OF A PHYSICIAN CONSTITUTE ADMISSION OF AN UNSPIRITUAL STATE? IS DEPRESSION THE RESULT OF SIN OR A CHEMICAL IMBALANCE IN THE BRAIN? THE DEVELOPMENT OF AN INTEGRATED CHRISTIAN PSYCHIATRY IS NEEDED TO COUNTER THE VERY PERVERSIVE SEXUAL THEORIES OF FREUD WHICH HAVE IN CRUEST FORMS MADE SEX THE HIGHEST FORM OF HUMAN EXPERIENCE, AND BORROWING FROM DARWIN, MADE SEXUAL PROWESS AN INDEX OF FITNESS IN THE SURVIVAL OF THE FITTEST.

THE CRISIS IN HEALTH CARE COST FORMS ANOTHER CHALLENGE FOR CLEAR CHRISTIAN THOUGHT. AS MUCH AS 22% OF THE HEALTH CARE DOLLAR IS INVOLVED DIRECTLY OR INDIRECTLY WITH LEGAL EXPENSE. NEW DRUGS ARE EXPENSIVE TO A LARGE DEGREE BECAUSE OF THE HIGH COST OF APPROVAL AND MARKETING. ANOTHER 25% OF HEALTH CARE COSTS ARE CONSUMED BY ADMINISTRATIVE COST BY EITHER PRIVATE INSURERS OR THE GOVERNMENT. THE CHANGING RULES ON PAYMENT CREATE AN INDUSTRY OF CONSULTANTS TO HELP PROVIDERS MAXIMIZE PAYMENT BUT DO LITTLE TO IMPROVE HEALTH CARE AND ADD TO THE COST. APPROPRIATE RE-USE OF EXPENSIVE DISPOSABLES, MANDATORY ARBITRATION OF ALLEGED MALPRACTICE AND GREATER MEDICAL DISCIPLINE CONSTITUTE A PORTION OF THE SOLUTION.

PUBLIC HEALTH AND PREVENTATIVE MEDICINE HAVE GREAT POTENTIAL FOR DISEASE MODIFICATION. THE CLASH BETWEEN PERSONAL FREEDOM AND STRAIGHT FORWARD MEASURES TO IMPROVE HEALTH HAVE BEEN PRESENT IN ALCOHOL ABUSE AND TOBACCO USE FOR YEARS. AIDS HAS MADE VENEREAL DISEASE UNACCEPTABLY RISKY. AN ALL-OUT PREVENTATIVE EFFORT TO REDUCE VENEREAL DISEASE WOULD REQUIRE LIMITATION OF PERSONAL FREEDOM AND BANNING OF PORNOGRAPHY. PUBLIC HEALTH MEASURES SHOULD BE ADDRESSED IN OUR CHURCHES AS WELL. CLEAR AND CLEAN SCIENTIFIC DATA NEEDS TO BE PRESENTED REGARDING VITAMINS AND DIETS. IS EATING A HIGH FAT DIET AND/OR BEING OBESE A SIN? DOES PREVENTATIVE MEDICINE ALWAYS REFLECT GOD'S PLAN FOR MAN'S MAXIMAL LIVING?

PROBLEMS IN MEDICAL SCIENCE CREATE ENORMOUS CHALLENGES FOR THE SCIENTISTS TO RESOLVE. SCRIPTURAL WISDOM IS ESSENTIAL FOR WORTHWHILE SOLUTIONS.

23.

ON BEING A CHRISTIAN IN THE SCIENCES

WALTER R. HEARN
COMMITTEE FOR INTEGRITY IN SCIENCE EDUCATION
AMERICAN SCIENTIFIC AFFILIATION
BERKELEY, CA

ON BEING A CHRISTIAN IN THE SCIENCES IS THE TITLE OF A FORTHCOMING 1992 BOOKLET FROM ASA'S COMMITTEE FOR INTEGRITY IN SCIENCE EDUCATION, THE SECOND PUBLICATION OF A PROPOSED TRILOGY. TOGETHER, THE THREE PUBLICATIONS WILL COVER SCIENCE EDUCATION FROM A CHRISTIAN POINT OF VIEW, AT ALL LEVELS AND ADDRESSING IN TURN VARIOUS PRODUCERS, CONSUMERS, AND SUPPORTERS OF SCIENCE EDUCATION.

LIKE THE COMMITTEE'S TEACHING SCIENCE IN A CLIMATE OF CONTROVERSY, THIS SECOND ASA EFFORT WAS STIMULATED BY A NATIONAL ACADEMY OF SCIENCES PUBLICATION. IN ITS 1989 BOOKLET, ON BEING A SCIENTIST, THE NAS COMMITTEE ON THE CONDUCT OF SCIENCE DEALT WITH THE ETHICS, ETIQUETTE, AND PUBLIC RELATIONS OF DOING AND PUBLISHING SCIENTIFIC WORK. FROM ITS SECULAR POINT OF VIEW, THE NAS COMMITTEE DISCUSSED VALUE JUDGMENTS GOING BEYOND STRICTLY EMPIRICAL CONFINES. IT CHALLENGED GRADUATE STUDENTS AND BEGINNING RESEARCHERS TO PAY ATTENTION TO QUESTIONS OF VALUE, FOR THE GOOD OF SCIENCE AND OF THE NATION.

THE ASA COMMITTEE'S PUBLICATION IS LIKEWISE AIMED AT GRADUATE STUDENTS IN THE SCIENCES. IT RECOMMENDS ON BEING A SCIENTIST BUT TRIES TO ANCHOR ITS OWN DISCUSSION OF VALUES IN SCIENCE TO A BIBLICAL FOUNDATION RATHER THAN A SECULAR CONSENSUS. THE BOOKLET WILL 1) HELP CHRISTIAN STUDENTS DECIDE WHETHER SCIENCE IS THEIR "CALLING" AND 2) PRESENT CERTAIN PROBLEMS AND OPPORTUNITIES FACING CHRISTIANS ENGAGED IN SCIENTIFIC WORK. IT WILL CONCLUDE WITH SUGGESTIONS FOR FURTHER READING ON THE HISTORY, PHILOSOPHY, AND SOCIOLOGY OF SCIENCE AND ON THE INTERRELATION OF SCIENCE AND CHRISTIAN FAITH. IT WILL RECOMMEND JOINING ASA FOR CONTINUED ENCOURAGEMENT.

SUPPORT FOR THIS PROJECT HAS COME FROM THE STEWARDSHIP FOUNDATION AND THE M. J. MURDOCK CHARITABLE TRUST. THE PAPER PRESENTED WILL BE ESSENTIALLY A PROGRESS REPORT, WITH PORTIONS OF THE MANUSCRIPT AVAILABLE FOR PERUSAL AND COMMENT. A PREFACE FROM A MEMBER OF BOTH ASA AND NAS, PLUS A LIST OF REVIEWERS WHO ARE DISTINGUISHED SCIENTISTS CLEARLY IDENTIFIED AS CHRISTIANS, SHOULD ADD CREDIBILITY TO ASA'S APPROACH. ADDRESSING THE BOOKLET TO CHRISTIANS MAY LIMIT ITS APPEAL TO SOME EXTENT, BUT THE SPIRIT AND INTEGRITY OF WHAT IS SAID SHOULD NEVERTHELESS SERVE AS A WITNESS TO THOSE OUTSIDE THE CHRISTIAN COMMUNITY. REPRESENTATIVES OF EVANGELICAL MINISTRIES TO THE ACADEMIC COMMUNITY HAVE ENDORSED THE ASA PROJECT, GUARANTEEING WIDE DISTRIBUTION AMONG STUDENTS. ALTHOUGH WRITTEN PRIMARILY FOR GRADUATE STUDENTS, THE BOOKLET SHOULD HELP CHRISTIAN UNDERGRADUATES AND EVEN HIGH SCHOOL STUDENTS CONSIDER CAREERS IN SCIENTIFIC WORK. THE AUTHOR OF THE PAPER IS ALSO THE PRINCIPAL AUTHOR OF THE BOOKLET.

A COURSE DESIGNED TO INTEGRATE SCIENCE AND FAITH
AT EASTERN NAZARENE COLLEGE

KARL W. GIBERSON, PH.D
ASSOCIATE PROFESSOR OF PHYSICS
EASTERN NAZARENE COLLEGE
QUINCY, MA

KATHERINE B. FREDERICH, PH.D
ASSISTANT PROFESSOR OF BIOLOGY
EASTERN NAZARENE COLLEGE
QUINCY, MA

EPOCH MAKING EVENTS IN SCIENCE (EMES) IS A GENERAL EDUCATION COURSE AT EASTERN NAZARENE COLLEGE THAT IS REQUIRED OF ALL STUDENTS AND, TOGETHER WITH COGNATE COURSES IN LITERATURE, ART & MUSIC, PHILOSOPHY, RELIGION, BIBLICAL STUDIES, AND HISTORY COMPRISE THE HEART OF THE ACADEMIC PROGRAM.

THE GOALS OF THE COURSE ARE: (1) TO EXAMINE SEVERAL OF THE GREAT IDEAS OF SCIENCE: THE ENVIRONMENTS FROM WHICH THEY AROSE, THE PEOPLE INVOLVED, AND THEIR IMPACTS UPON CONTEMPORARY AND SUCCEEDING CIVILIZATION; (2) TO EXPOSE THE STUDENTS TO THE BACKGROUND INFORMATION NECESSARY TO UNDERSTAND CURRENT DEVELOPMENTS IN SCIENCE; (3) TO ACQUAINT THE STUDENTS WITH THE PHILOSOPHY, METHODOLOGY, PRESUPPOSITIONS, AND LIMITATIONS OF THE SCIENTIFIC METHOD; AND (4) TO HELP THE STUDENT APPRECIATE AND UNDERSTAND THE COMPLEX IMPACT THAT SCIENTIFIC DEVELOPMENTS HAVE HAD AND ARE HAVING ON THE CHRISTIAN FAITH. CONSIDERABLE EFFORT IS MADE TO HELP THE STUDENTS, MOST OF WHOM ARE NOT SCIENCE MAJORS, INTEGRATE THE INFORMATION IN THE COURSE INTO A COHERENT CHRISTIAN WORLD VIEW.

THE LECTURES IN THE COURSE ARE ORGANIZED AROUND THE FOLLOWING THEMES:

(1) OUR CHANGING CONCEPT OF THE UNIVERSE DEALS WITH THE DEVELOPMENT OF OUR CURRENT VIEW OF THE UNIVERSE WHICH HAS CHANGED FROM A HUMAN CENTERED COSMOS DOMINATED BY THE EARTH TO A MUCH VASTER UNIVERSE IN WHICH MAN, WOMAN, AND THE EARTH SEEM SOMEHOW TO BE INSIGNIFICANT.

(2) OUR CHANGING CONCEPT OF LIFE DEALS WITH THE SUCCESS THAT BIOLOGY HAS HAD IN UNRAVELING THE MYSTICAL FABRIC OF LIFE. ATTENTION IS GIVEN TO MODERN GENETICS, EVOLUTION, AND ECOLOGY AND THEIR ETHICAL AND THEOLOGICAL IMPLICATIONS.

THE COURSE IS THOROUGHLY INTERDISCIPLINARY WITH FACULTY NOT ONLY FROM BIOLOGY, PHYSICS, AND CHEMISTRY, BUT ALSO PHILOSOPHY AND RELIGION. WE PLAN TO PRESENT THE FOLLOWING MATERIALS USED IN THIS COURSE: (1) THE SYLLABUS; (2) THE TEXTBOOKS AND STUDY GUIDES. WE HAVE DEVELOPED OUR OWN IN-HOUSE TEXTBOOK WHICH BRINGS TOGETHER THE HISTORICAL MATERIAL RELEVANT TO THE VARIOUS DISCIPLINES AND WE ALSO USE SCIENCE LITERACY BY HAVEN AND TREFIL AND THE GALILEO CONNECTION BY CHARLES HUMMEL; (3) THE HANDS ON ACTIVITIES, WHICH WE HAVE ASSIGNED TO DEMONSTRATE THE SCIENTIFIC METHOD, THE VALUE OF MODELS, AND PATTERN RECOGNITION AS A TOOL FOR SCIENTIFIC CLASSIFICATION; (4) DISCUSSION SUPPLEMENTS FOR THE TEXTS AND THE FILM SERIES "THE DAY THE UNIVERSE CHANGED"; (5) LECTURE GUIDES; AND (6) TEST BANKS.

THE "GOLLUM" SYNDROME IN POPULARIZATION OF PHYSICAL SCIENCE:
SEARCHING FOR ROOTS, FORGETTING THE BRANCHES

KENNETH N. CARTER, JR., PH.D. (CHEMISTRY)
DIVISION OF SCIENCE
NORTHEAST MISSOURI STATE UNIVERSITY
KIRKSVILLE, MO

IN J. R. R. TOLKIEN'S FANTASY TRILOGY, "LORD OF THE RINGS", THE DEBASED CHARACTER GOLLUM WAS DESCRIBED AS ONE WHO SPENT SO MUCH TIME DIGGING DOWN FOR ROOTS THAT HE FORGOT THE LEAVES AND THE BRANCHES, AND THE SIGHT OF THE SUN BECAME HATEFUL TO HIM. OBSERVATION OF THIS PHENOMENON AND THE SPURIOUS REASONING THAT ACCOMPANIES IT MAY BE ONE REASON FOR A DISTRUST OF SCIENCE IN SOME PARTS OF THE CHURCH.

TWO OTHERWISE MERITORIOUS POPULAR BOOKS ON PHYSICS THAT APPEAR TO SUFFER FROM GOLLUM SYNDROME ARE P. W. ATKIN'S "THE SECOND LAW" (SCIENTIFIC AMERICAN LIBRARY) AND FRANK WILCZEK AND BETSY DEVINE'S "LONGING FOR THE HARMONIES" (NORTON). UNLIKE "THE GOD WHO WOULD BE KNOWN" BY CHRISTIANS JOHN M. TEMPLETON AND ROBERT L. HERRMANN OR "GOD AND THE NEW PHYSICS" BY NON-CHRISTIAN PAUL DAVIES, THESE BOOKS ARE NOT BILLED AS ATTEMPTS TO PROPOUNDING DIVINE REVELATIONS IN NATURAL SCIENCE OR AT DOING NATURAL THEOLOGY. RATHER, THEY ARE ADVERTISED AS LUCID EXPOSITIONS OF WELL ESTABLISHED SCIENCE PRESENTED IN A FORM ACCESSIBLE TO NON SPECIALISTS. THEY EACH MAINTAIN THIS ROLE NEARLY TO THE END, BUT THEN, IN CONCLUDING SECTIONS ENTITLED "THE APOTHEOSIS OF THE STEAM ENGINE" AND "HIDDEN HARMONIES", RESPECTIVELY, THEY QUIT PROFESSING SCIENCE AND BEGIN PROFESSING FAITH.

FOR INSTANCE, IN HIS CONCLUDING SECTION, "THE APOTHEOSIS OF THE STEAM ENGINE", ATKINS STATES: "WE ARE THE CHILDREN OF CHAOS, AND THE DEEP STRUCTURE OF CHANGE IS DECAY. AT ROOT, THERE IS ONLY CORRUPTION, AND THE UNSTEMMABLE TIDE OF CHAOS. GONE IS PURPOSE; ALL THAT IS LEFT IS DIRECTION. THIS IS THE BLEAKNESS WE HAVE TO ACCEPT AS WE PEER DEEPLY AND DISPASSIONATELY INTO THE HEART OF THE UNIVERSE." MEMBERS OF ASA WILL RECOGNIZE THE TRANSITION FROM PROFESSION OF SCIENCE TO PROFESSION OF FAITH. LESS SOPHISTICATED READERS, ESPECIALLY THE YOUNG, MAY NOT RECOGNIZE THE SWITCH. IN DENYING "PURPOSE" TO "OUR OWN AND OTHERS' EXISTENCE" AND IN ATTRIBUTING "GREATER NOBILITY" TO THE STEAM ENGINE, ATKINS IS TACITLY BEGGING A NUMBER OF INTERESTING PHILOSOPHICAL QUESTIONS.

WILCZEK AND DEVINE STATE THAT "DESPITE HUNDREDS OF YEARS OF DIALOGUE WITH NATURE, SCIENTISTS HAVE YET TO HEAR FROM A SINGLE EXTRANATURAL WILLFUL AGENT." WHAT DO THEY EXPECT TO HEAR, AND HOW?

I THINK THAT AN APPROPRIATE PREFACE IS IN ORDER FOR SUCH STATEMENTS. SOME PREFACE SUCH AS "TO SOME OF US WHO DRAW OUR METAPHYSICS PURELY FROM OUR INTERPRETATION OF FUNDAMENTAL PHYSICAL LAWS, IT SEEMS THAT..." WOULD LABEL THE METAPHYSIC AND RELIGION FOR WHAT THEY ARE. WE SHOULD SURELY DESIRE FOR OUR SECULAR COLLEAGUES THE SAME FREEDOM WE DESIRE TO EXPRESS THEIR CONVICTIONS IN PRINT. HOWEVER, AS ASA MEMBER V. ELVING ANDERSON SAID (CHRISTIANITY TODAY, OCTOBER 8, 1982) "IT IS WHEN SCIENTISTS MAKE RELIGIOUS PRONOUNCEMENTS (SUCH AS DENYING THE EXISTENCE OF GOD), BASING THEIR REASONING ON THEIR SCIENCE, THAT THE REAL PROBLEM ARISES. SO, RATHER THAN TRY TO MAKE SCIENCE MORE RELIGIOUS, OUR JOB AS CHRISTIANS IS TO HELP KEEP IT MORE HONEST."

FOR SUCH WHO SEEK THE ROOTS, A STATEMENT BY GEORGE MACDONALD MAY APPLY:

"HUMAN SCIENCE IS BUT THE BACKWARD UNDOING OF THE TAPESTRY-WEB OF GOD'S SCIENCE, WORKS WITH ITS BACK TO HIM, AND IS ALWAYS LEAVING HIM-HIS INTENT, THAT IS, HIS PERFECT WORK-BEHIND IT, ALWAYS GOING FARTHER AND FARTHER AWAY FROM THE POINT WHERE HIS WORK CULMINATES IN REVELATION."

**BACK TO THE FUTURE AND AROUND THE WORLD:
TAYLOR'S BIOLOGY SENIOR SEMINAR**

ANDREW P. WHIPPLE
BIOLOGY DEPARTMENT
TAYLOR UNIVERSITY
UPLAND, IN

IN OUR EAGERNESS TO EDUCATE OUR STUDENTS FOR THE FUTURE WE OFTEN BECOME FAR TOO ENAMORED WITH PROGNOSTICATIONS AND FORGET BASIC PRINCIPLES UPON WHICH OUR GRADUATES MUST LIVE THEIR PERSONAL AND PROFESSIONAL LIVES. IT IS THE PURPOSE OF THIS PRESENTATION TO DESCRIBE THE BIOLOGY SENIOR SEMINAR AT TAYLOR UNIVERSITY AS AN EXAMPLE BY WHICH TO PREPARE THE SOON-TO-GRADUATE STUDENT WITH A FORWARD AND BACKWARD LOOKING OVERVIEW OF WHAT IT MEANS TO BE TRAINED AS A CHRISTIAN IN THE BIOLOGICAL SCIENCES. EMPHASIS WILL BE PLACED ON BASING OUR STUDENTS IN FOUNDATIONAL PRECEPTS PRIOR TO CONSIDERING WHAT THE NEXT TECHNOLOGICAL WIZARDRY HOLDS, RATHER THAN TRAINING THEM IN THE CRISIS INTERVENTION MODE OF ETHIC BUILDING IN RESPONSE TO NEWLY ARRIVED TECHNOLOGICAL PROBLEMS.

THE BASIC DESIGN OF THE TAYLOR SENIOR SEMINAR IS TO DEVOTE 4 DAYS TO ACTIVITIES EXPERIENCED BY THE ENTIRE SENIOR CLASS, FOCUSED ON A THEME WHICH IS THEN CARRIED OVER FOR THE NEXT THREE AND A HALF WEEKS IN INDEPENDENT DEPARTMENTAL SESSIONS. THE INTENT IS TO PROVIDE A UNIFYING EXPERIENCE FOR ALL THE SENIORS WHILE SIMULTANEOUSLY ALLOWING FOR THE DIVERSITY INHERENT TO THE MANY DIFFERENT DISCIPLINES. IN THE PAST 6 YEARS THE THEME HAS BEEN 'JERUSALEM', 'JERUSALEM AND ATHENS', AND 'PREPARING FOR THE FUTURE'; EACH OF THESE HAS EMPHASIZED GLOBAL AND CROSS-CULTURAL AWARENESS AND THE NEED OF THE CHURCH TO PROVIDE AN ETHICAL BASIS UPON WHICH TO LIVE AND ACT.

WITHIN THE FRAMEWORK OF THIS STRUCTURE AND THEMATIC DIRECTION THE BIOLOGY SESSIONS DURING THE FINAL THREE AND A HALF WEEKS HAVE POINTED THE STUDENTS TO A POLISHING OF THEIR UNDERSTANDING OF WHAT IT WILL MEAN FOR THEM TO BE REPRESENTATIVES OF THE SCIENTIFIC COMMUNITY TO THEIR LOCAL CHURCH, AND FOR THEM TO BE REPRESENTATIVES OF THE BODY OF CHRIST TO THEIR SCIENTIFIC PROFESSIONAL COMMUNITIES. THE FOCUS IN THIS SECTION IS BACKWARD, THAT IS TO THE HISTORIC FOUNDATIONS OF SCIENCE AND CHRISTIANITY AND THEIR INTERACTION RATHER THAN SPECIFICALLY TO CURRENT/FUTURE TECHNOLOGICAL CIRCUMSTANCES. CONCURRENT WITH THIS ESTABLISHMENT OF RADICAL CONCEPTS THE STUDENTS DEVELOP A RESEARCH PROPOSAL IN THE REALM OF MODERN BIOLOGY. THEREFORE THE SENIORS ARE LOOKING BACK AND INTO THE FUTURE AT THE SAME TIME BY WAY OF THESE TWO DIFFERENT COURSE COMPONENTS. THE LAST COMPONENT OF THE BIOLOGY PART OF SENIOR SEMINAR IS THE PRESENTATION BY STUDENT GROUPS OF AN ETHICALLY CONTROVERSIAL CURRENT TOPIC IN BIOLOGY; THE CHARGE TO THE GROUPS IS TO INVOLVE THE ENTIRE CLASS IN AN INTERACTIVE SITUATION UTILIZING WHATEVER MEANS THEY WISH IN ORDER TO ENGAGE THE REST OF THE CLASS.

THE GOAL OF THIS COURSE IS TO PRODUCE GRADUATES WHO ARE PREPARED THROUGH CONSIDERATION OF FOUNDATIONAL PRINCIPLES, THE PREPARATION OF A RESEARCH PROPOSAL IN AN AREA OF THEIR CHOICE, AND THE ACTIVE WRESTLING WITH AN ETHICALLY CONTROVERSIAL ASPECT OF CURRENT BIOLOGY, TO FUNCTION AS CREDIBLE SCIENTISTS AND CREDIBLE CHRISTIANS IN THEIR PROFESSIONAL AND SPIRITUAL COMMUNITIES.

PSEUDOGENES AND HUMAN EVOLUTION

JIM BEHNKE
ASBURY COLLEGE
DEPARTMENT OF CHEMISTRY
WILMORE, KY

WHILE SOME TYPE OF EVOLUTION OF NON-HUMAN ORGANISMS SEEMS TO BE ACCEPTED BY A LARGE MAJORITY OF EVANGELICAL SCIENTISTS, A MUCH SMALLER PROPORTION OF THIS GROUP IS WILLING TO ACCEPT THE EVOLUTION OF HUMANS FROM AN EARLIER, NON-HUMAN PRIMATE. RECENTLY, MOLECULAR BIOLOGICAL STUDIES HAVE SHOWN THE EXISTENCE OF DIFFERENT TYPES OF PSEUDOGENES (IMPERFECT COPIES OR VERSIONS OF A GENE WHICH HAVE A SIGNIFICANTLY REDUCED FUNCTION) IN HUMANS AND OTHER MAMMALS. AMONG THOSE WHICH HAVE BEEN STUDIED ARE THE $\psi B1$ GENE IN THE B-GLOBIN COMPLEX, IN WHICH THE ATG STARTING CODON IS A NONFUNCTIONAL GTG CODON, AND THREE PROCESSED PSEUDOGENES, THE DOPAMINE D5 RECEPTOR, THE ECHAIN OF IGE AND CYTOCHROME OXIDASE SUBUNIT VI. THE HIGH DEGREE OF SIMILARITY OF THE HUMAN VERSIONS OF THESE FOUR PSEUDOGENES AND THE CORRESPONDING ONES FOUND IN THE OTHER ANIMALS PRESENTS A PROFOUND CHALLENGE TO THE STANDARD BELIEF IN THE SPECIAL CREATION OF HUMANS AND SUGGESTS THE BIOLOGICAL EVOLUTION OF HUMANS FROM A NON-HUMAN PRIMATE. THESE PSEUDOGENES WILL BE DESCRIBED AND THE IMPLICATIONS OF THEIR EXISTENCE WILL BE DISCUSSED, IN THE HOPE OF GENERATING DISCUSSION ON THE SUBJECT OF HUMAN EVOLUTION.

"OBSTACLES AND OPPORTUNITIES FOR CHRISTIAN WITNESS"

ROBERT KAITA, PH. D.
PLASMA PHYSICS LABORATORY
PRINCETON UNIVERSITY
PRINCETON, NEW JERSEY

RECENT WORLD EVENTS HAVE CREATED NEW OPPORTUNITIES IN COUNTRIES FORMERLY CLOSED TO CHRISTIAN WITNESS. IN THE FORMER SOVIET UNION, FOR EXAMPLE, THERE ARE NO LONGER ANY RESTRICTIONS TO THE DISSEMINATION OF CHRISTIAN LITERATURE, AND THE POLITICAL AND ECONOMIC UNCERTAINTIES FACING THE "COMMONWEALTH OF INDEPENDENT STATES" HAVE RESULTED IN A PARTICULAR OPENNESS TO THE BIBLE'S MESSAGE OF HOPE. ACCESSIBILITY TO THE GOSPEL HAS BECOME EASIER EVEN IN THE PEOPLE'S REPUBLIC OF CHINA.

THE EVENTS OF 1989 NOTWITHSTANDING, THE LEADERSHIP OF THAT NATION RECOGNIZE THE IMPORTANCE OF WESTERN TECHNOLOGY FOR ITS CONTINUED ECONOMIC DEVELOPMENT. THE RESULT IS IN AN EVER INCREASING NUMBER OF SCHOLARLY EXCHANGES INVOLVING THE UNITED STATES AND OTHER WESTERN COUNTRIES, ESPECIALLY IN SCIENCE AND ENGINEERING. CHRISTIANS CAN EXPLOIT THE CONTACTS THEY PROVIDE WITH CHINESE COLLEAGUES IN THESE AREAS. AS ATTRACTIVE AS THE US APPEARS TO BE, THERE IS MUCH THAT CONCERNS THE AMERICAN SCIENTIFIC COMMUNITY AS WELL. A RECENT SURVEY BY THE AMERICAN PHYSICAL SOCIETY FOUND THAT MANY OF THE BRIGHTEST YOUNG PHYSICISTS FOUND THE RESEARCH CLIMATE TO BE "DISMAL," AND THE RE-EXAMINATION OF VALUES AND PRIORITIES RESULTING FROM SUCH ATTITUDES MAY FOSTER AN INCREASED RECEPTIVENESS TO THE CLAIMS OF CHRIST. THESE TOPICS WILL BE DISCUSSED IN CONTEXT OF PERSONAL EXPERIENCES IN BOTH THE FORMER SOVIET UNION AND THE PEOPLE'S REPUBLIC OF CHINA, AND AS A SCIENTIST WITH ADMINISTRATIVE RESPONSIBILITIES ON A LARGE RESEARCH FACILITY IN THE US FUSION PROGRAM.

1 "THEIR MOST PRODUCTIVE YEARS: YOUNG PHYSICS FACULTY IN 1990," PHYSICS TODAY, FEBRUARY 1991.

THE SCIENTIFIC AMERICAN AFFAIR:**RESPONDING TO RELIGIOUS DISCRIMINATION IN THE WORKPLACE**

FORREST M. MIMS, III
EDITOR, SCIENCE PROBE
SEGUIN, TEXAS 78155

IN RECENT YEARS A NUMBER OF PROFESSIONAL EDUCATORS, JOURNALISTS AND SCIENTISTS IN THE UNITED STATES HAVE LOST OPPORTUNITIES, ASSIGNMENTS AND EVEN JOBS BECAUSE OF THEIR CHRISTIAN BELIEFS. ANECDOTAL EVIDENCE SUGGESTS THAT DISCRIMINATION AGAINST CHRISTIANS HAS CAUSED AT LEAST SOME BELIEVERS TO CONCEAL THEIR BELIEFS FROM THEIR PEERS AND SUPERVISORS.

TODAY'S BELIEVERS CAN TAKE COMFORT IN KNOWING THAT FIRST CENTURY CHRISTIANS WERE SUBJECTED TO CONSIDERABLY HARSHER FORMS OF DISCRIMINATION THAN THAT METED OUT TO A FEW OF OUR CONTEMPORARIES. BUT IF PRECEDENT IS A PRUDENT GUIDE, DISCRIMINATION AGAINST CHRISTIANS IN THE UNITED STATES MAY EXPAND IN COMING YEARS.

CHRISTIAN PROFESSIONALS CAN AND MUST RESPOND TO THIS ISSUE. SINCE SCIENCE IS SO OFTEN USED TO CHALLENGE BASIC CHRISTIAN TENETS, CHRISTIANS WHO ARE SCIENTISTS HAVE A SPECIAL RESPONSIBILITY IN MAKING THEIR VIEWS KNOWN.

THIS DISCUSSION WILL ADDRESS A SPECIFIC EXAMPLE OF DISCRIMINATION, THE CANCELING OF A SCIENCE WRITER'S ASSIGNMENT TO WRITE A POPULAR COLUMN FOR SCIENTIFIC AMERICAN BECAUSE OF THE WRITER'S FAILURE TO ENDORSE DARWINIAN EVOLUTION AND ABORTION. THE DISCUSSION WILL ANALYZE THE RESPONSE TO THIS ACT OF DISCRIMINATION BY THE MEDIA, COMMENTATORS, PROFESSIONAL SCIENTISTS, COMMENTATORS, ORTHODOX JEWS AND CHRISTIANS. FINALLY, A RECOMMENDATION FOR A CENTRALIZED MEANS TO PROVIDE A PROMPT RESPONSE TO ACTS OF DISCRIMINATION AGAINST CHRISTIAN PROFESSIONALS WILL BE OUTLINED.

QUANTUM MECHANICS, BELL'S THEOREM,
AND IMPLICATIONS FOR A CHRISTIAN VIEWPOINT

DILLARD W. FARIES
WHEATON COLLEGE
WHEATON, IL

CLASSICAL THEORIES, LOCAL DETERMINISTIC REALISTIC THEORIES, EVENTUALLY FAILED. QUANTUM THEORY, ON THE OTHER HAND, HAS BEEN A GREAT SUCCESS AS A MEANS OF CALCULATING RESULTS OF EXPERIMENTS. THE SPECTACULAR SUCCESSES HAVE YIELDED TREMENDOUS CONFIDENCE IN THE QUANTUM THEORY AND OPTIMISM IN ITS COMPLETE DOMINANCE OF THE WORLD OF PHYSICAL PHENOMENA. NEVERTHELESS, THE INTERPRETATIONS AND THE MEANING OF QUANTUM THEORY ARE MUCH HARDER. REMARKABLE AGREEMENT OF THEORY WITH EXPERIMENT DOES NOT PRODUCE AGREEMENT ABOUT INTERPRETATIONS. EINSTEIN BATTLED WITH BOHR ABOUT COMPLETENESS, NON-LOCALITY, THE STATISTICAL NATURE, AND OBJECTIVE REALITY. IN BRIEF, EINSTEIN WANTED TO RETAIN AS MUCH OF THE CLASSICAL PICTURE AS POSSIBLE. HE INSISTED THAT THE QUANTUM THEORY WAS INCOMPLETE.

IN 1965, JOHN BELL PROVED A THEOREM WHICH ALLOWS SOME CAREFUL DISTINCTIONS. HE DEvised AN INEQUALITY WHICH MUST HOLD FOR LOCAL REALISTIC SYSTEMS. THIS THEOREM FALLS NICELY INTO THE TRADITION OF EINSTEIN'S CONSTRUCTION OF THOUGHT-EXPERIMENTS WHICH PROBED THE DEPTHS OF QUANTUM THEORY. RATHER THAN BRING QUANTUM THEORY INTO QUESTION, BELL'S THEOREM BRINGS EINSTEIN'S CHERISHED PRINCIPLES, LOCALITY AND OBJECTIVE REALITY INTO QUESTION. QUANTUM THEORY VIOLATES THE INEQUALITIES POSED BY BELL'S ANALYSIS, AND EXPERIMENTS CONTINUE TO CONFIRM THE CORRECTNESS OF THE QUANTUM THEORY.

GIVEN THE APPARENT VICTORY OF QUANTUM THEORY OVER LOCAL THEORIES OF OBJECTIVE REALITY, WHAT CHOICES DO CHRISTIANS HAVE? DO WE FOLLOW EINSTEIN AND CONTINUE TO BATTLE FOR OBJECTIVE REALITY? IS LOCALITY A PRINCIPLE IN WHICH WE HAVE A STAKE? DOES OCCAM'S RAZOR ACT AS A LIMIT ON OUR CHOICE OF THEORIES OR INTERPRETATION? CAN WE ALLOW OUR GOD TO PLAY DICE? ARE WE WORRYING ABOUT REALISM IN THE WRONG CATEGORIES? ARE WE EXPECTING TOO MUCH OF OUR UNDERSTANDING OF NATURE OR OF GOD? THE INTERCONNECTIONS OF THESE CONCEPTS MAKE ALL OF THESE QUESTIONS DIFFICULT. WE CANNOT EXPECT TO PRODUCE CHRISTIAN ANSWERS TO THESE QUESTIONS, BUT WE NEED TO DEVELOP DIALOG.

ARE GENESIS 1 DAYS 24 HOURS?
A THOUGHTFUL READING PROVIDES THE ANSWER -- NO!

C. GORDON WINDER
PROFESSOR(EMER.) OF GEOLOGY
UNIVERSITY OF WESTERN ONTARIO
LONDON, CANADA, N6A 5B7

THAT EARTH IS VERY OLD IS ACKNOWLEDGED BY GOVERNMENT SURVEYS AND PROFESSIONAL ORGANIZATIONS OF GEOSCIENTISTS WHICH USE THE STANDARD GEOLOGICAL TIME SCALE. THE MAJORITY OF CHRISTIAN GEOLOGISTS ACKNOWLEDGE THE GEOLOGICAL EVIDENCE AS INDICATIVE OF A VERY OLD EARTH. HOWEVER, MANY CHRISTIANS ARE PERPLEXED BY THE SIX DAYS OF GENESIS, WHICH, IF CONSIDERED AS 24 HOURS, DICTATES EARTH IS VERY YOUNG.

GENESIS 1 DOES PROVIDE A HIGHLY ABBREVIATED HISTORY FOR EARTH, BEGINNING WITH THE CREATION OF UNIVERSE AND EARTH, TO THE ORIGIN OF MANKIND. [UNTIL THE YEAR 1800, GENESIS WAS THE BEST, READILY-AVAILABLE HISTORY OF EARTH.] THE SEQUENCE OF EVENTS IS REMARKABLY SIMILAR TO THE HISTORY AS DETERMINED FROM GEOSCIENCE. THE RELATIONSHIP IS EVEN MORE REMARKABLE WHEN ONE CONSIDERS THE SCRIBE, PROBABLY A GEOCENTRIC, COULD WRITE, BUT NEVER TOOK A COURSE IN GEOLOGY OR SCIENCE.

TWO CRITICAL POINTS IN GENESIS MUST BE CONSIDERED.

1. THE SUN AND THE MOON FIRST CAME INTO EXISTENCE ON THE FOURTH DAY. THEREFORE THE FIRST, SECOND, AND THIRD DAYS CAN NOT BE 24 HOURS. 2. THE PHRASE "THE EVENING AND THE MORNING" OCCURS FOR EACH DAY, BUT READING THE PHRASE LITERALLY INDICATES THE PERIOD WHEN THE MOON PROVIDES THE LIGHT, WHICH IS NIGHT -- NOT DAY.

LET US DECREASE THE ARGUING, ESCHEW CONFUSION, INCREASE RATIONAL DISCUSSION, AND INITIATE RESOLUTION FOR THE BENEFIT OF BOTH CHRISTIANITY AND SCIENCE. THE RECOMMENDATION IS MADE THAT THE DAYS OF GENESIS ARE LONG PERIODS OF APPROXIMATELY EQUAL AND UNSPECIFIED LENGTH, WITHOUT EQUATING TO THE PERIODS OF THE GEOLOGIC TIME SCALE. HOWEVER, THE EARTH HISTORIES DERIVED FROM GENESIS AND GEOSCIENCE ARE COMPATIBLE.

**SUPERNATURE:
AT THE CENTER OF SCIENCE-RELIGION TENSIONS**

**PAUL ADAMS
UNIVERSITY OF MICHIGAN-FLINT**

IN THE WORLD VIEW OF NATURALISM, ONLY PHYSICAL NATURE EXISTS. IN SCIENTIFIC INVESTIGATIONS, ONLY PHYSICAL NATURE CAN BE STUDIED. THIS RELATIONSHIP HAS LED MANY IN BOTH RELIGIOUS AND NON-RELIGIOUS COMMUNITIES TO CONCLUDE THAT A SPECIAL AFFINITY EXISTS BETWEEN SCIENCE AND NATURALISM. WITHIN SECULAR SOCIETY AFFIRMATIONS OF THE SUPERNATURAL ARE OFTEN SEEN AS UNDERMINING THE ACTIVITY OF GENUINE SCIENCE, AND AMONG CHRISTIANS SCIENTIFIC CLAIMS OF NATURAL CAUSATION ARE FREQUENTLY REGARDED AS DIMINISHING THE POWER AND INVOLVEMENT OF GOD IN THE COSMOS.

EACH OF THESE CONCLUSIONS IS DUE TO A DISTORTION OF THE SUPERNATURAL PERSPECTIVE. THE CONTENTION THAT THE SCIENTIFIC ATTITUDE REQUIRES A REJECTION OF SUPERNATURAL ACTIVITY CAN BE REFUTED PHILOSOPHICALLY AND HISTORICALLY. THE ASSERTION THAT SCIENTIFIC EXPLANATIONS ARE LESS GODLY THAN SUPERNATURAL EXPLANATIONS CONSTITUTES A RELIGIOUS BIAS THAT IS DESTRUCTIVE AND UNSCRIPTURAL.

THROUGHOUT THE HISTORY OF SCIENCE-RELIGION CONFLICTS, THESE DISTORTIONS OF THE SUPERNATURAL HAVE PLAYED A PIVOTAL ROLE. THEY ARE MOST APPARENT TODAY IN THE EVOLUTION-CREATION CONTROVERSY. WITHIN THAT CONTEXT THE SUPERNATURAL BIAS IS PROBABLY THE PRINCIPAL REASON WHY PROGRESSIVE CREATIONISTS REJECT THEISTIC EVOLUTION AS A CONTINGENT POSITION.

**BEYOND RATIONALISM, INDIVIDUALISM AND TRIBALISM:
REDEFINING THE SELF IN THE COSMOS**

PABLO POLISCHUK, PH.D.
GORDON CONWELL THEOLOGICAL SEMINARY

CURRENT TRENDS IN THE PSYCHOLOGY OF PERSONALITY REVEAL AN EMPHASIS UPON REDEFINITIONS OF THE SELF BEYOND THE RATIONALISTIC, INDIVIDUALISTIC AND ETHNOCENTRIC CHARACTERIZATIONS OF THIS CENTURY. SUCH VIEWS ARE INFLUENCED BY AN ACCELERATED GLOBALIZATION IN WHICH THE WESTERN BIAS ARE EXPERIENCING THE CHALLENGE OF OTHER CONSTRUCTS AND CULTURAL DEFINITIONS. THE LONG-STANDING EMPHASIS UPON TECHNOLOGICAL AND RATIONALISTIC APPROACHES RECEIVE THE CHALLENGES OF APPROACHES WHICH PROVIDE ROOM FOR PSEUDOSPIRITUAL, TRANSPERSONAL AND DIALOGICAL CONCEPTS OF THE SELF. THE CHRISTIAN VIEWS, AS ENCOMPASSED IN BIBLICAL ANTHROPOLOGY AND THEOLOGY HAVE ALLOCATED ROOM FOR RELATIONAL DEFINITIONS WHICH ADDED A SOCIAL DIMENSION TO THE ONTOLOGICAL OR SUBSTANTIAL DEFINITIONS OF PERSONHOOD.

APPROACHES WHICH HAVE EMPHASIZED THE LOGICAL ASPECTS OF THE SELF WITH INDIVIDUALISTIC AND SUBSTANTIAL EMPHASIS PRESENTED IN PROPOSITIONAL MANNER, EXPERIENCE THE ALTERNATIVE OF CONSTRUCTIONISTIC IDEAS WHICH REFLECT A NARRATIVE, DIALOGICAL AND INTERSUBJECTIVE DEFINITION. ATOMISTIC TRENDS AND WHOLISTIC ONES HAVE BEEN DISPUTING THEIR SUPREMACY IN ESTABLISHING BASIS FOR UNDERSTANDING, AS WELL AS THE IDIOGRAPHIC VS. THE NOMOTHETIC LINES OF RESEARCH AND INVESTIGATION.

THE FINAL DECADE OF THE 20TH CENTURY WITNESSES A PERIOD THAT MAY BE CALLED PRE-PARADIGMATIC, AS NO NEW THEORIES HAVE EMERGED AND NO GURU IN PARTICULAR HAS STOLEN THE SHOW, WITH THEORISTS TRYING TO COMPARE AND ANALYZE THE EXISTING PROPOSITIONS RATHER THAN ADVOCATING RADICAL NEW ONES. IN ATTEMPTS TO INTEGRATE PSYCHOLOGY AND THEOLOGY, CHRISTIAN EDUCATORS, PRACTITIONERS AND RESEARCHERS HAVE ENGAGED IN A VARIETY OF MODELS BUT WITHOUT SHOWING ANY COHESIVE OR GLOBALIZED APPEAL. AS WE APPROACH THE NEXT CENTURY, THE SELF FINDS ITSELF LOST IN THE COSMOS: TRYING TO DECIPHER THE MYSTERIES OF THE UNIVERSE AND DEFINE ITS OWN CONTEXT IN TERMS OF ITS ORIGIN, FUNCTION AND PURPOSE, THE SELF REMAINS AS A PERPLEXED ENTITY WITHOUT ANY FORMAL OR FINAL DEFINITION.

THE DIALOGICAL NATURE OF THE SELF IS PRESENTED AS A BEING-IN-RELATION IN THE WORLD, WITH RELATIONAL, WHOLISTIC AND PURPOSIVE DEFINITIONS THAT DRAW FROM BIBLICAL ANTHROPOLOGY AND THEOLOGY AS WELL AS FROM A CONSTRUCTIONISTIC-EXISTENTIAL APPROACH. SUCH APPROACH ALLOCATES ROOM FOR THE ENCOUNTER WITH THE POSTULATOR OF THE COSMOS AND ITS CONTENTS AS WELL AS OF THE PERSONS PLACED AS ACCOUNTABLE ADMINISTRATORS. NARRATIVE ASPECTS AND CREATIVE ENDEAVORS INTEGRATE INTO THE PROPOSITIONAL, SCIENTIFIC AND DOGMATIC ASPECTS, PROVIDING A DYNAMIC/RELATIONAL TRANSCENDENCE THAT DRAWS FROM REVELATORY BASIS VS. THE PSEUDOSPIRITUAL TRENDS OF THE CURRENT DECADE. IN SUM, A REDEFINITION OF THE SELF IS NEEDED AS WE FACE THE CHALLENGES OF A NEW CENTURY MARKED BY GLOBALIZED, NON-WESTERN TRENDS.

THE EPIC OF EPOCHS AND THE MYTH OF MEANING

FROM THE PERSPECTIVE OF A SCIENTIST AND A CHRISTIAN

LARRY MARTIN, PH.D.

ASSISTANT PROFESSOR OF PHYSICS

NORTH PARK COLLEGE

CHICAGO, IL

THE INTENTION IN MANY CIRCLES TODAY SEEMS TO BE TO INCORPORATE THE BEST PHILOSOPHY AND SCIENCE OF THE DAY INTO A NEW MYTH WHICH WILL EITHER REPLACE OR SUPPORT TRADITIONAL THEOLOGIES. SHOULD THIS BE OUR TASK IN THE ASA? CAN WE AVOID DISTORTING THE ESSENTIALS OF THE CHRISTIAN MESSAGE BY MAKING AN INFLEXIBLE SYSTEM THAT HINDERS RESPONSE TO NEW INTELLECTUAL CURRENTS? ANY PROPOSAL THAT SIMPLY CONTORTS MODERN SCIENCE INTO AGREEMENT WITH SOME MYTH IS BOUND TO BE RENDERED EITHER OBSOLETE IF THE SCIENCE CHANGES, OR MEANINGLESS WHEN THE SCIENCE IS FOUND TO LACK THE INTERIOR INTERPRETIVE FRAMEWORK WHICH WOULD ALLOW IT TO REPLACE THE MYTH. THE STRATEGY OF CHANGING THE GOSPEL IS, OF COURSE, ANATHEMA. I SUGGEST THAT THE PROPER WAY OF VIEWING THE PROBLEM IS AS A QUESTION OF EXEGESIS AND TRANSLATION. I ASSUME THAT EVERYONE, THE PAGAN OF YESTERDAY AND THE SCIENTIFICALLY LITERATE OF TODAY, IS SEARCHING FOR GOD. WE MUST EXAMINE TECHNO-TALES AND THE SCIENTIFIC STORIES FOR THEIR MEANING. WE CAN COMPARE THESE WITH ANCIENT ALLEGORIES AND PRIMITIVE PARABLES TO SEE HOW FULFILLING A REPLACEMENT THEY ARE. WE ARE LEFT WITH THE TASK OF TRANSLATING THE GOSPEL SO THAT IT CAN BE PROPERLY UNDERSTOOD BY SCIENTISTS. THE QUESTION BECOMES, OF COURSE, ARE WE INNOVATIVELY RETAILING (AND PERHAPS DISTORTING IN ORDER TO SELL) OR FAITHFULLY RETELLING THE OLD, OLD STORY?

THE POWER OF MYTH IS CONTAINED IN ITS ABILITY TO CONVEY DIRECTION AND PURPOSE. MYTHS HAVE INTENDED TO EXPLAIN OR DESCRIBE SPACE AND TIME, DIRECTION AND PURPOSE. THE POWER OF A NEW SCIENTIFIC MYTH TO REPLACE THE OLD TRADITIONS WILL DEPEND ON ITS ABILITY TO SUPPLY OUR DEEPEST HUMAN NEEDS. BY COMPARING THE FUNCTION AND INTENT OF SOME OLDER MYTHS AND THE SCIENTIFIC REPLACEMENTS, WE CAN LEARN ABOUT THE EFFECTIVENESS AND ATTRACTIVENESS OF THE SCIENTIFIC SAGAS OF COSMOGENESIS, BIOGENESIS, AND ANTHROPOGENESIS. BY RECOGNIZING THE SURFACE SIMILARITIES BETWEEN ANCIENT AND MODERN STORIES, WE WILL LEARN MORE ABOUT THE POTENTIAL PITFALLS AND POSSIBLE PROFITS IN OUR TASK AS EVANGELISTS TO THE SCIENTIFIC COMMUNITY.

"METAL SOURCES AND TECHNOLOGY IN THE BIBLICAL WORLD"

EDWIN YAMAUCHI
MIAMI UNIVERSITY
OXFORD, OH

THE EARLIEST REFERENCE TO A PRECIOUS METAL IS THE NOTICE OF GOLD IN GENESIS 2:11. THE EARLIEST REFERENCE TO METALLURGY IN THE SCRIPTURES IS THE DESCRIPTION OF TUBAL-CAIN (GEN 4:22) AS ONE WHO "FORGED ALL KINDS OF TOLLS OUT OF BRONZE AND IRON." THE PHILISTINES HAD AN ADVANTAGE OVER THE ISRAELITES IN THEIR KNOWLEDGE OF IRON TECHNOLOGY (JUDGES 1:19, I SAM. 13: 19-22). SOLOMON WAS ASSOCIATED WITH METALLURGICAL ACTIVITIES AND TRADE. HE WAS ALSO CREDITED WITH FABULOUS SUMS OF GOLD AND SILVER. JEREMIAH (6: 29-30) WAS AWARE OF THE PROCESS OF REFINING SILVER.

ARCHAEOLOGISTS HAVE GENERALLY DIVIDED THE PERIODS OF THE THIRD AND SECOND MILLENNIA IN TERMS OF THE BRONZE AND IRON AGES. THEIR DISCOVERIES OF A VARIETY OF ORES, MINES, METALLURGICAL PROCESSES, AND OBJECTS HAVE NOW SHED LIGHT ON MANY BIBLICAL PASSAGES. SOME PREVIOUS INTERPRETATIONS HAVE HAD TO BE DISCARDED, FOR EXAMPLE, NELSON GLUECK'S INTERPRETATION OF A BUILDING AT TELL EL-KHELEIFAH NEAR THE GULF OF AGABA AS A SOLOMONIC SMELTERY. I WOULD LIKE TO REVIEW THE CONSIDERABLE EVIDENCE FOR AN OVERVIEW OF THIS SUBJECT.

SCIENCE AND SCIENTISM IN 21ST CENTURY EDUCATION

PHILLIP E. JOHNSON
UNIVERSITY OF CALIFORNIA
BERKELEY, CA

ON ANY LIST OF THE LEADING FIGURES WHO INFLUENCED THE TWENTIETH CENTURY MIND ONE WILL FIND THREE NAMES: DARWIN, MARX, AND FREUD. ALL THREE OF THESE TOWERING FIGURES ARE VEHEMENTLY ANTI-CHRISTIAN, AND ALL SOUGHT TO PROVIDE A FIRM BASIS FOR KNOWLEDGE ON A FOUNDATION OF SCIENTIFIC NATURALISM. AS THE TWENTIETH CENTURY ENDS, TWO OF THESE FIGURES -- MARX AND FREUD HAVE BEEN THOROUGHLY DISCREDITED. DARWINISM RETAINS MUCH OF ITS INFLUENCE, BUT THE DARWINIAN THEORY IS UNDER RENEWED ATTACK ON BOTH SCIENTIFIC AND PHILOSOPHICAL GROUNDS. AT THE SAME TIME, THERE IS WORLDWIDE DISCONTENT WITH THE EDUCATIONAL, CULTURAL, AND POLITICAL CONSEQUENCES OF MODERN THINKING. SOCIETIES AND THEIR SCHOOLS HAVE ENORMOUS DIFFICULTY IN DETERMINING WHAT VALUES SHOULD BE TAUGHT TO THE YOUNG. THIS DIFFICULTY IS DIRECTLY RELATED TO THE INTELLECTUAL HERITAGE OF SCIENTIFIC NATURALISM, WITH ITS DISTINCTION BETWEEN "FACTS"(ABOUT WHICH SCIENCE CAN PROVIDE KNOWLEDGE), AND "VALUES" (WHICH ARE INHERENTLY A MATTER OF SUBJECTIVE BELIEF). THE GREAT CHALLENGE OF THE TWENTY-FIRST CENTURY WILL BE TO REDISCOVER A CONCEPT OF KNOWLEDGE WHICH PROVIDES A SECURE BASIS FOR MORAL VALUES.

"SCIENCE EDUCATION IN THE 21ST CENTURY"

MARK D. HARTWIG, PH.D.
EXECUTIVE DIRECTOR
ACCESS RESEARCH NETWORK

PREDICTING THE FUTURE IS NEVER SAFE. THEREFORE, INSTEAD OF MAKING UNQUALIFIED PREDICTIONS ABOUT SCIENCE EDUCATION IN THE NEXT CENTURY, THIS TALK WILL EXAMINE SEVERAL RECENT TRENDS IN SCIENCE EDUCATION, AND MAKE SOME GUARDED PREDICTIONS ABOUT WHAT WILL HAPPEN IF THESE TRENDS CONTINUE.

IN THE LAST SEVERAL YEARS, SCIENCE EDUCATION HAS BEEN CHARACTERIZED BY FOUR MAJOR TRENDS:

1. A TREND TOWARD PRODUCING SCIENTIFIC LITERACY IN ALL STUDENTS RATHER THAN SCIENTIFIC VIRTUOSITY IN A FEW.
2. A TREND TOWARD TEACHING SCIENCE IN A MANNER THAT IS RELEVANT TO STUDENTS' DAILY LIVES.
3. A TREND TOWARD TEACHING SCIENCE IN AN INTEGRATED MANNER, STRESSING COMMON THEMES THAT CUT ACROSS SCIENTIFIC DISCIPLINES AND CONTINUITIES WITH OTHER CURRICULUM AREAS, SUCH AS ENGLISH, MATH, AND SOCIAL STUDIES.
4. A TREND TOWARD TEACHING SCIENCE AS A WAY OF KNOWING RATHER THAN A STATIC BODY OF KNOWLEDGE.

ALL IN ALL THESE TRENDS ARE HEALTHY, AND ARE WORTHY OF OUR SUPPORT. HOWEVER, ANOTHER CHARACTERISTIC OF SCIENCE EDUCATION IS A STRONG COMMITMENT TO A POSITIVIST PHILOSOPHY OF SCIENCE, WHICH IS MARKED BY SCIENTISM AND A THOROUGHGOING NATURALISM.

SHOULD SCIENCE EDUCATORS CONTINUE IN THEIR ALLEGIANCE TO A POSITIVIST SCIENCE, WHICH HAS BEEN REPUDIATED BY INCREASING NUMBERS OF PHILOSOPHERS AND SCIENTISTS, THE FOUR TRENDS MENTIONED ABOVE WILL HAVE THE UNHEALTHY EFFECT OF PROMOTING A NATURALISTIC PHILOSOPHY UNDER THE AEGIS OF "SCIENTIFIC LITERACY." MOREOVER, WITH THE PUSH TOWARD RELEVANT SCIENCE, INTEGRATION, AND SCIENCE AS A WAY OF KNOWING, THIS NATURALISTIC PHILOSOPHY WILL EXPAND FAR BEYOND THE SCIENCE CLASSROOM, INTO OTHER CURRICULUM AREAS AND INTO THE STUDENTS' PERSONAL LIVES. THE NET EFFECT, WILL BE AN INCREASING PRIVATIZATION AND MARGINALIZATION OF TRADITIONAL VIEWPOINTS -- ESPECIALLY IN THE AREAS OF METAPHYSICS AND ETHICS.

THIS TALK WILL CONCLUDE WITH AN ASSESSMENT OF HOW PROBABLE THIS SCENARIO IS, AND A DISCUSSION OF THE WAYS IN WHICH CHRISTIAN SCIENTISTS AND EDUCATORS CAN CHALLENGE THIS PHILOSOPHICAL "IMPERIALISM" WHILE STILL RESPECTING THE INTEGRITY OF SCIENCE.