

Session A—Contributed Papers

Chairman—Enno Wolthuis,
Calvin College

- 3:30 PM "Ecological Crisis: How Did the Fall of Man Affect Creation?", *Frank Roberts, Delaware County Christian School*
- 4:00 PM "Stewardship of Wildlife Resources", *John Cruzan, Geneva College*
- 4:30 PM "Implications of Behavior Setting Theory to Stewardship of the Environment in Daily Life",
Edassery James, Purdue University
- 5:00 PM "Wood as an Energy Source—The View from the Potbelly Stove",
John W. Haas, Jr., Gordon College

Session B—Contributed Papers

Chairman—Robert Herrmann,
Oral Roberts University

- 3:30 PM "Rational Self-Interest and Public Goods: A Philosophical Study", *Michael D. Redmond, Pastor, Montclair, New Jersey*
- 4:00 PM "Human Rights—A Basis for Christian Action or a Trap for the Unwary?"
William L. Kelly, Birmingham, Michigan
- 4:30 PM "Ancient Ecologies and the Biblical Perspective",
Edwin Yamauchi, Miami University [Ohio]
- 5:00 PM "Soli Deo Gloria", *Charles W. Lucas, Jr. Smithsonian Science Information Exchange*
- 5:30 PM Supper

Session A—Contributed Papers

Chairman—Paul Hoeksema,
Ferris State College

- 7:30 PM "Scientists as Prophets", *Dewey Carpenter, Louisiana State University*
- 8:00 PM "Conservation of Human Resources: A Model for The Classroom Teacher",
Donald Grigsby, University of Alabama
- 8:30 PM "A Christian Perspective on Education in the Biomedical Sciences", *Robert Herrmann, Oral Roberts University*

Session B—Contributed Papers

Chairman—Kurt Weiss,
University of Oklahoma

- 7:30 PM "Does a Proper Interpretation of the Bible Require a Recent Creation? Report of a Panel Discussion",
James Buswell, III, Wheaton College
- 8:00 PM "Surtsey: A Micro-Laboratory for Food Geology", *Marvin Lubenow, Pastor, Fort Collins, Colorado*
- 8:30 PM "The Plymouth Brethren and Creation",
E.R. Woodside, Pasadena, California

GENERAL MEETING INFORMATION

REGISTRATION

Registration will be in the lobby of the DeWitt Student and Cultural Center on the Hope College Campus beginning at 10:00 AM on Friday, August 11. Registration fee for ASA members is \$25.00 and for non-members is \$30.00. All students are \$5.00.

TRAVEL

Holland is on Lake Michigan near Grand Rapids. For driving you can take IH 196 and follow the exit signs from north or south at Holland to direct you to the college. For flying you will have to make connections from either Chicago or Detroit to Grand Rapids. You can be picked up at the Grand Rapids airport (only 20 miles from Holland) if you will let us know your plans in advance.

ACCOMMODATIONS

Rooms are available on campus but do not have air conditioning or private baths. For information on motels, please write the Elgin office of the ASA. The nightly charge for rooms on campus is \$8 for a single and \$5 for a double. Children under 12 are free. The daily rate for three meals is \$7.40 with children under 12 for half price.

PARKING

Parking is available on campus at no charge.

COMMUNICATION

Mail should be addressed to:
(Delegate's Name)
c/o ASA Meeting
Hope College
Holland, MI 49423

Phone messages may be made to:
(616) 392-5111

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

American Scientific Affiliation
5 Douglas Avenue
Elgin, Illinois 60120

Official Program

THIRTY THIRD ANNUAL MEETING of the

AMERICAN SCIENTIFIC AFFILIATION

(Incorporated)

The American Scientific Affiliation is an association
of men and women who have made a personal
commitment of themselves and their lives
to Jesus Christ as Lord and Savior,
and who have made a personal
commitment of themselves
and their lives to a
scientific under-
standing of
the
world.

August 11-14, 1978
HOPE COLLEGE
Holland, Michigan

**FINAL PROGRAM—ANNUAL MEETING OF THE
AMERICAN SCIENTIFIC AFFILIATION**

**MEETING THEME: A CHRISTIAN STEWARDSHIP
OF NATURAL RESOURCES**

FRIDAY, AUGUST 11

- 10:00 AM Registration (until Evening Meeting)
5:30 PM Supper
7:30 PM Opening Session Welcome
Opening Address: "To Grow or Not to Grow—that is the Question",
Clark Pinnock, McMaster Divinity College

SATURDAY, AUGUST 12

- 7:30 AM Breakfast
8:30 AM Group Devotions
Plenary Session—Symposium: Christian Stewardship and Natural Resources (By 1977-78 Fellows of the Calvin Center for Christian Scholarship)
Chairman—Howard Claassen, Wheaton College
9:00 AM "Stewardship: An Inquiry into the Concept", *Peter DeVos, Calvin College*
9:20 AM "The Incarnation as a Model for Human Care of Creation",
Loren Wilkinson, Trinity College
9:40 AM "Stewardship and Economic Systems",
Eugene Dykema, Calvin College
10:00 AM Break
10:30 AM "Soft Energy and Hard Facts",
Vernon Ehlers, Calvin College
10:50 AM "Stewardship of the Deep Seabed",
Calvin DeWitt, University of Wisconsin
11:10 AM Summary and Discussion
12:00 PM "Household Re-Cycling — A Potential Community Service for Concerned Christians",
James Bosscher, Calvin College
12:30 PM Lunch
2:00 PM ASA National Business Meeting
3:00 PM Break
Session A—Contributed Papers
Chairman—Clarence Menninga, Calvin College
3:30 PM "Explanation, Testability, and the Theory of Evolution", *T. Harry Leith, York University*
4:00 PM "The Role of Intelligence in Prebiotic Simulation",
Charles Thaxton, Probe Ministries
4:30 PM "Thermodynamics and Origins — The Place of Free Energy and Entropy in Chemical Reactions",
John W. Haas, Jr., Gordon College
5:00 PM "The Attitude of College Students Toward the Creation-Evolution Controversy",
Jerry Bergman, Bowling Green University

Session B—Contributed Papers

- Chairman—Dewey Carpenter, Louisiana State University*
3:30 PM "Is Energy a Christian Issue?",
Richard H. Bube, Stanford University
4:00 PM "Soft and Hard Paths and Human Values"
Roger Hinrichs, State University College at Oswego, New York
4:30 PM "Identification of Tasks in Exercising Good Management of Energy Resources",
John H. Martin, Sheaffer & Roland, Inc., Chicago
5:00 PM "Three Solar Installations on the Jordan College Campus",
DeWayne Coxon, Jordan College

ANNUAL BANQUET

- 6:30 PM Dinner
7:30 PM Address: "God Was Right: Stewardship of the Earth is Possible", *John R. Sheaffer, Sheaffer & Roland Inc., Chicago*

SUNDAY, AUGUST 13

- 8:00 AM Breakfast
9:00 AM Group Devotions
10:00 AM Participation in Local Churches
12:15 PM Lunch

Session A—Contributed Papers

- Chairman—Ronald Beery, Holland, Michigan*
1:30 PM "Some Thoughts on Inspiration",
H. Harold Hartzler, Mankato, Minnesota
2:00 PM "Love and Logic",
David Neuhouser, Taylor University
2:30 PM "Sources of Conflict in the Integration of Science and the Bible",
James A. Rynd, Biola College

Session B—Contributed Papers

- Chairman—Henry Bengelink, Calvin College*
1:30 PM "The Basis for Christian Giving to the Poor and Hungry", *L. Duane Thurman, Oral Roberts University*
2:00 PM "Population Issues, Demographic Theory, and Christian Response",
Bee-Lan C. Wang, Wheaton College
2:30 PM "Population Control and World Hunger",
Jeff Schloss, Graduate Student, Washington University

Plenary Session—Public Meeting

- 3:30 PM "When Enough is Enough",
Clark Pinnock, McMaster Divinity College
5:30 PM Supper
7:30 PM Special Interest Groups for Discussion: Complete List Available at Meeting

MONDAY, AUGUST 14

- 7:30 AM Breakfast
8:30 AM Group Devotions

Session A

Symposium—Stewardship Dilemmas in Natural Resource Management

- 9:00 AM "Is Clearcutting a Responsible Forestry Practice?"
Harry Wiant, Jr., West Virginia University
9:20 AM "A Wildlife Dilemma—Michigan Deer Management", *Morrison D. Ismond, Consultant, Otsego, Michigan*
9:40 AM "Water, Water Everywhere....",
Dennis Hesel, Virginia Polytechnic Institute and State University
10:00 AM Break
10:30 AM "Energy and Land Use Attitudes",
William Johnson, University of Michigan
10:50 AM "Institutional Dilemmas in Geotherman Energy Exploration and Development",
Jay Dick, Chaffee Geothermal, Ltd., Denver
11:10 AM Summary Statement, *Laurence Walker, Stephen F. Austin State University*
Discussion Period

Session B—Contributed Papers

- Chairman—James Buswell, III, Wheaton College*
9:00 AM "Basis Psychological Research and the Challenge of Integration", *Dennis Ridley, SUNY, Geneseo and D.E. Johnson, University of Arkansas*
9:30 AM "Toward the Development of a Christian Psychology: Comparative and Physiological Psychology",
Ronald Kotesky, Asbury College
10:00 AM Break
10:30 AM "Coping with a No-Growth Economy: Insights from Psychological Research",
David Myers and Thomas Ludwig, Hope College
11:00 AM "Induced Abortion: A Christian Solution?" *Kenneth VanDellen, MaComb County Community College*
11:30 AM "Michigan PBB Problem: Another Business Ethical Matter",
David Helland, Homewood, Illinois
12:30 PM Lunch

Plenary Session

- 2:00 PM "The Pollution of Sodom—Human and Divine",
Clark Pinnock, McMaster Divinity College
3:00 PM Break

ABSTRACTS FOR THE 33RD ANNUAL MEETING
OF THE
AMERICAN SCIENTIFIC AFFILIATION
HOPE COLLEGE, HOLLAND, MICHIGAN
AUGUST 11 - 14, 1978

BERGMAN, JERRY - Bowling Green State University, Bowling Green, Ohio
"The Attitude of College Students Towards the Creation-Evolution Controversy"

With the creation-evolution controversy again coming to the fore, it is instructive to be aware of the opinions of teachers in teacher training programs. The opinions of teachers who will soon be out in the field likely represent the attitudes which will be conveyed to students in the future.

An opinionnaire was designed to assess the attitudes of students in teacher training programs toward the creation-evolution question. In addition, a sample of biology majors was utilized to contrast the opinions of biology majors and non-biology majors. Essentially it was found that over 90% felt that both creation and evolution should be taught. The percentage was lower for biology majors. In addition about 40% of the students classified themselves as pure creationists, 50% as theistic evolutionists, and only about 10% as atheistic evolutionists. In addition, biology majors expressed considerable concern over this area, feeling that the theory of evolution was compatible to religious faith. They stressed that evolution clearly did not give all the answers and they are aware of the many problems and gaps in this theory, but accepted it somewhat by default.

BOSSCHER, JAMES P. - Calvin College, Grand Rapids, Michigan
"Household Recycling - A Potential Community Service Opportunity for Concerned Christian Citizens"

Initially, the multiple societal and environmental dividends of and imperatives for source-separation, household recycling for a concerned community are delineated and evaluated.

Next, three proven models for the establishment of a separation-based community recycling enterprise are described and contrasted. They are (a) the all-volunteer effort, (b) the non-profit corporation, and (c) the municipal operation.

Finally, a series of low-cost, "battle-tested" recycling devices constructed from "junk" and "off-the-shelf" components to aid in the implementation of a community recycling enterprise are presented and plans provided.

BUBE, RICHARD H. - Stanford University, Stanford, California
"Is Energy a Christian Issue"

What is the role of the Christian with respect to issues involving energy? Do we have a responsibility as Christians to dig in to meet these problems, or do we simply turn our back on signs of growing crisis in order to devote ourselves to spiritual matters while waiting on a figurative mountaintop for the end to come?

In addition to understanding the perspective on energy gained by viewing it from the point of view of the Third World countries and by the poor everywhere in the world, we may consider four reasons commonly advanced against Christian concern

with the energy issue in any depth. First, there is general disbelief that an energy crisis is worth being concerned about; trust in God delivers us from such concern. Second, the relevance of energy as an area for effort may be questioned because of its close ties to the material world - hardly a proper way for spiritually minded Christians to devote their efforts. A third reason for Christian lack of involvement in energy concerns is an involvement with eschatological predictions that prevent us from being concerned with the demise of a dying earth. A final reason that sometimes leads Christians to turn their backs on the energy issue is that no uniquely Christian solution can be found; if it is only "a practical matter," it hardly qualifies as Christian witness and service.

A Christian response is offered to these objections in terms of the biblical view of stewardship. Guidelines for faithful stewardship are suggested.

BUSWELL, JAMES O., III - Wheaton College, Wheaton, Illinois

"Does a Proper Interpretation of the Biblical Text require a Recent Creation? Report of a Panel Discussion"

On May 2, 1978 the Wheaton College Division of Science and Mathematics and the Division of Biblical Studies and Archaeology jointly sponsored a panel discussion of the above question.

The panel was planned in the interest of determining the specific theological or doctrinal implications of the single factor of how long ago creation took place. Setting aside the scientific questions it was hoped that the theological mandates, taken for granted in the familiar debate format, could be specified as to precisely which ones are jeopardized by a geologically ancient creation.

Panelists were, affirmative: the Rev. Marvin Lubenow, Pastor, Fort Collins, CO, and Dr. Duane Gish, Assoc. Director, Inst. for Creation Research, San Diego, CA; negative: Dr. Walter Kaiser, Trinity Evangelical Divinity School, Deerfield, IL, and former ASA President, Dr. David Willis, Oregon State University, Corvallis. Moderator: Dr. J. Julius Scott, Jr., Wheaton College Graduate School.

Principal arguments of each will be briefly reviewed. It will be shown that the affirmative did not treat the arguments of the negative which indicated that a geologically ancient creation was not only (a) historically compatible with thorough-going Christian orthodoxy but (b) exegetically demanded by the text itself.

Finally an affirmative answer was given by Dr. Gish to the question, "From what has been presented here tonight would you be willing to grant that there is at least one other form of biblical creationism than the one that you firmly hold?" Implications will be suggested (a) for a fairer and more accurate identification of the "creationist" position before the Christian public; and (b) for the future unification of our testimony before those who do not share the Christian theistic worldview.

CARPENTER, DEWEY K. - Louisiana State University, Baton Rouge, Louisiana
"Scientists as Prophets"

Nature is not only the creation of God; she is used by God to bring good and to bring disaster upon us. She is, to the attentive, a potential vehicle of the Word of God. The Word which comes may be one of judgment or one of grace. It is related both to the general purpose of God and to the particular circumstances addressed. However, nature normally remains inarticulate as a Word-bearer unless

there is an interpreter who brings her potential speech into actuality—a prophet. The Old Testament is replete with examples of nature becoming articulate through prophetic declarations. This conjunction of nature and prophecy was in Biblical times usually expressed in a way which did not find ready acceptance by the practitioners of institutional religion or of state political policy. These were in fact judged by God using natural scourges such as famine, locusts, floods, and diseases. In such instances, the prophet was one who felt compelled to oppose the main direction in which his society was traveling, to publicly call it into question, and to predict tragic consequences if repentance did not occur.

Nature is still God's creation. She continues to be used by Him to bring blessing or disaster upon us. She continues to have a Word for us if she can only become articulate. The contemporary counterpart of the Biblical Prophet who articulates this Word is, as before, usually not part of the religious establishment. Today, he does not even usually claim to speak in Yahweh's name. Nature's prophet today is the scientist. Examples of his concern include: consumption of energy resources, the over-use of chemical pesticides, the depletion of the ozone layer, research involving recombinant DNA, and the disposal of radioactive wastes.

It is apparently neither easier or harder today to accept and to act upon a prophetic word than it was in Biblical times. Is the magnitude of the potential disaster which contemporary prophets predict any less?

CRUZAN, JOHN - Geneva College, Beaver Falls, Pennsylvania
"Stewardship of Wildlife Resources"

It is appropriate that we give a high priority to environmental problems which directly influence mankind's survival and well-being. However we should not neglect those other problems which may seem to be peripheral to man's future. One such area is our proper dominion over the other created organisms. Scripture demonstrates that they have God's approval, are important to him, bring him pleasure, and cause him to be praised. Therefore, our stewardship must include consideration for them. Some of these creatures are in danger of extinction. We need to promote their preservation even though they may seem insignificant from our perspective. Others are becoming less abundant in a world dominated by human activity. Establishment of natural areas in and around our communities may be a part of our stewardship of these native plants and animals. On an individual level we ought to consider natural landscaping and the provision of habitat for wildlife in the management of our properties. In order to do this we must make ourselves aware of the needs of wildlife and also re-examine our attitudes toward personal land use. Benefits from this would include an increased awareness of, and sensitivity to, the creation and savings in time and energy.

DE VOS, PETER A. - Calvin College, Grand Rapids, Michigan
"Stewardship: An Inquiry into the Concept"

Throughout the environmental debate of the last decade or so, many Christians have re-emphasized the need for people to view themselves as stewards acting under God. Little analytical work, however, has been done on the concept of stewardship and on its relationships to love and justice. This paper presents the beginnings of such analysis. Moreover, it attempts to set the call to stewardship in the context of a general philosophical anthropology.

DE WITT, CALVIN B. - University of Wisconsin, Madison, Wisconsin
 "Stewardship of the Deep Seabed"

The developed world is preparing for mining abundant and extensive manganese nodule deposits from the deep seabed, an area declared by the United Nations to be "the common heritage of mankind." This paper presents an analysis of the situation, and poses serious questions on the exercise of international justice, the unilateral exploitation of common resources, and the responsible treatment of ocean environments and of human kind.

DICK, JAY D. - Chaffee Geothermal, Ltd., Denver, Colorado
 "Institutional Dilemmas in Geothermal Energy Exploration and Development"

A major hindrance in promoting and developing geothermal energy is the lack of public awareness for the need and usage of this abundant natural resource. This lack of public awareness combined with America's strong environmental movement has allowed legislation to either be non-existent or highly restrictive toward the development of geothermal resources. Legislative institutional barriers are the major deterrent to the progress of the geothermal industry in the United States.

The institutional inefficiencies involved in drilling a shallow temperature gradient hole are a classic example of the dilemmas faced in geothermal exploration. Temperature gradient holes do not produce any geothermal fluids but are merely used to measure the natural temperature of the earth. After testing, these holes are abandoned and the area is returned to its natural environment. To drill such a hole in Colorado a permit must be reviewed by the Colorado Oil and Gas Conservation Commission, State Engineer's Office, Department of Water Quality, Department of Air Quality, and the Colorado Geological Survey. Geothermal resources in Colorado are defined as "... hot water, hot brine, and all other products of geothermal processes;..." (Colorado Geothermal Resources Act of 1974). What is "hot" water and what are geothermal processes? Indefinitive laws such as these can delay geothermal exploration and development for months.

As a Christian in energy exploration and development, every situation is not addressed from the perspective of "How do I face this as a Christian." Ideally, Christian values and life-style prevail to such a degree that all situations are dealt with, either consciously or subconsciously, in a way that glorifies Christ. The frustrations of institutional dilemmas can lead to severe physical and mental stress. Dealing with these frustrations in a business-like and ethical manner can only be accomplished when the true peace-of-mind of Christ and a knowledge that Christ is in control of every aspect of the world, is innate in one's life.

DYKEMA, EUGENE R. - Calvin College, Grand Rapids, Michigan
 "Stewardship and Economic Systems"

In a world that God has created and still owns, how can men utilize what they have been given in a way that is faithful to God's purposes? The "economic problem" faced by mankind requires that a system of coordination be developed and utilized which will allocate resources to various uses and distribute rewards, especially material rewards, in a just and fitting manner. One such system is a competitive market for which claims of efficiency and somewhat weaker claims of justice have been put forward. An examination of these claims leads to serious questions about their legitimacy and to the quest for an economics which comports better with Christian values.

EHLERS, VERNON J. - Calvin College, Grand Rapids, Michigan
 "Soft Energy and Hard Facts"

What is the answer to our energy crisis? Most experts support accelerated development of presently used energy sources, primarily coal and nuclear fission. Some persons propose stringent energy conservation measures, and others, most notable Amory Lovins, advocate a total re-thinking of our approach to meeting our end-use energy needs, a re-thinking which led Lovins to the concept of soft energy paths. But who is right? This paper attempts to construct a framework, based on Christian principles of stewardship and justice, which may aid us in analyzing the various energy issues and options. This framework is then used, in conjunction with the more traditional technological analysis, to draw some conclusions about appropriate Christian responses to our energy crisis.

GRIGSBY, DONALD L. - University of Alabama, Birmingham, Alabama
 "Conservation of Human Resources: A Model for the Classroom Teacher"

We are concerned about the use of our exhaustible and our renewable natural resources, as well we should be. But what about the waste of human resources which are vital to our society? Aside from the tragic waste due to accidents, disease and wars, there is the loss of human talent when humans are placed in prisons and mental hospitals. These latter institutions are especially wasteful when the rate of recidivism is considered. Since the hope for "cure" is minimal in these two types of institutions, then, it may be that the "ounce of prevention" is needed.

It is in the prevention of the loss of human resources that the classroom teacher has a unique opportunity. Through the day-to-day activities in the classroom talents can be developed before they are lost and we can conserve one of our most vital resources. This is not a proposal for a detailed program for classroom teachers; rather, it is intended to be a presentation of the ideas of Dr. Calvin Taylor and Dr. Uri Haber-Schaim in a model for classroom teachers. Especially, it will be a model for science teachers in the development of human talents. Detailed curriculum guides and methods of instruction could conceivably follow, but this is a presentation of preliminary model.

HAAS, JOHN W., JR. - Gordon College, Wenham, Massachusetts
 "Thermodynamics and Origins - The Place of Free Energy and Entropy in Chemical Reactions"

Christians have often appealed to thermodynamics in opposing theories for the origin of life which suggest that living matter originated through natural processes which built upon the reactions of a few simple molecules found on the primordial earth. Typically the second law (entropy) has been used to argue against the likelihood that the primordial molecules could spontaneously react to form the highly organized structures of the simplest living systems. The role of free energy in the context of equilibrium and non-equilibrium thermodynamics is seldom discussed. In this paper the non-equilibrium approaches of Eigen and others to establish the essential requirements of structure and energy for organization to develop in molecular systems are considered.

"Wood as an Energy Source - The View from the Potbelly Stove"

A recent study by the U.S. Department of Energy found that New England forests could yield the energy equivalent of 540 million tons of coal or 2.3 billion barrels of oil by the year 2000 without reducing the amount of forested land. This is equiv-

alent to the total power output of 10 nuclear plants operating from now until the year 2000. This paper will consider the economic, ecologic and practical factors involved in the use of wood to heat homes. The development of highly efficient and attractive wood stoves offers the opportunity for the home owner in wooded areas to drastically reduce his need for non-renewable energy and in favorable situations markedly decrease his energy costs. Home construction factors, the availability of wood and physical limitations on the part of the user may argue against this approach.

HARTZLER, H. HAROLD - Mankato, Minnesota
 "Some Thoughts on Inspiration"

From the very beginning the members of the ASA have believed that the Bible is the inspired Word of God. All members are required to subscribe to the following statement: "The Holy Scriptures are the inspired Word of God, the only unerring guide of faith and conduct".

The Evangelical Theological Society, a group of evangelical theologians with which the ASA has had a number of joint meetings, has a similar doctrinal statement. It is as follows: "The Bible alone, and the Bible in its entirety, is the Word of God written, and therefore inerrant in the autographs".

However, as Harold Lindsell has stated in The Battle for the Bible, "Both of these groups have people in them who deny inerrancy. These organizations have been infiltrated by viewpoints at variance with what the organizations originally believed and set out to do".

The purpose of this paper is to make a plea for a return to our original belief in the full inspiration of the Bible.

There are three views of Scripture which have been held by students of the Bible. 1. The old liberal view. According to this, the Bible is a purely human book. 2. The neo-orthodox view. According to this view the Bible is fallible and contains errors. Yet when God's spirit uses this witness and makes it real to us, this human and fallible witness becomes God's Word to us. 3. The evangelical view. According to this view, the Bible in its entirety is the Word of God. As B. B. Warfield has stated in The Inspiration and Authority of the Bible, "The Bible is not man's report to us of what God says, but the very Word of God itself spoken by God Himself through human lips and pens".

The author of this paper subscribes to the latter view and will present arguments in its favor.

HELLAND, DAVID R. - Homewood, Illinois
 "Michigan PBB Problem: Another Business Ethical Matter"

The exposure of 60 - 100,000 food-producing animals in Michigan to poly-brominated biphenyl compounds (PBB) has been incompletely reported and scientific study has been retrospective. Private, corporate, and governmental liability has thrown the matter into the courts, and an exceedingly tedious process of judicial examination suggests that final liabilities will not be assessed for several years hence.

The exposure to PBB began as early as 1971, when Michigan Chemical Co. (MCC), now Velsichol Corp. began manufacture of PBB. It has produced magnesium oxide (MgO) for some time, which it has sold to cattle feed formulators mostly as a neutralizer for high-energy, high acid containing dairy rations. Contamination of material des-

tined for livestock consumption continued, but reached an apex in 1973, when several pallet loads of 50# bags of Firemaster were directly added to livestock formulations.

The feed company, Farm Bureau Service (FBS) took a number of illegal and deceptive actions to spread and dilute the contaminant once they became aware of its presence.

Deception, fabrication, and slander have arisen from claims of damages which now totals 120 million in livestock damages. Many of the dairymen involved are devout Christians of a Dutch heritage, and individual congregations have been seriously divided on the issue. A review of moral responsibilities in business practices is indicated.

HELSEL, DENNIS R. - Virginia Polytechnic Institute & State University, Blacksburg, VA
"Water, water everywhere...."

Preservation of drinking water supplies from contamination is a natural resources problem directly affecting everyone. Recent legislation has put increasingly strict limits on industrial and municipal waste discharges, in the effort to keep public water supplies clean. As a result, other pollution sources are now being recognized as villains.

A case in point is the Occoquan reservoir, located downstream from rapidly urbanizing northern Virginia. By the late sixties, massive algal blooms in the reservoir were causing doubts about the future utilization of the water supply. In an effort to reduce the nutrient inputs on which algae thrive, an advanced (tertiary) treatment plant, similar to the one presently operating at Lake Tahoe, has been constructed. This single plant collects and treats all municipal wastes from the area, discharging effluent low in nutrients. Sewerage bills have skyrocketed.

Studies conducted since 1971 indicate little improvement in reservoir water quality will result from the new treatment process. Nutrients washed from residential and urban areas during rainstorms are the dominant problem. Nitrogen and phosphorus in urban storm runoff have been found to be on the order of that in raw sewage. Metals and oxygen-demanding organics add to the runoff predicament. Most of these pollutants are believed to originate from highway vehicle exhaust.

To protect the integrity of this water supply, the water resources manager is faced with either 1. treating large volumes of stormwater runoff, an expensive solution, or 2. devising methods to decrease the pollution delivered from urban areas.

Such non-traditional pollution dilemmas previously have not been considered important. The first law of thermodynamics can be seen here: waste materials from the American lifestyle are neither created nor destroyed - but merely dumped into water supplies.

HERRMANN, ROBERT L. - Oral Roberts University, Tulsa, Oklahoma
"A Christian Perspective on Education in the Biomedical Sciences"

There is general recognition of a need for heightened ethical sensitivity among scientists, especially in the biomedical sciences area. An example of note is the current debate on recombinant DNA research, in which a sizable proportion of the protagonists discount any concerns other than those involving immediate public health

hazards. Missing is any discussion of the larger issues of eventual human experimentation and its ethical implications. These events point out the need for a revision of the educational process for graduate studies in the sciences. They present the Christian with a unique opportunity to point to elements of personal commitment in science, not unlike those in religious faith. Beyond this lies possibilities for exploring and defining spiritual dimensions in science of tremendous potential for its revitalization. A "whole person" science should be our goal.

HINRICHS, ROGER - State University College, Oswego, New York
 "Soft and Hard Energy Paths and Human Values"

Responsibility towards our energy resources is also concerned with the ways in which those resources are used to provide needed energy. Inconfronting our energy dilemma, we too often seek to remedy our situation only by increasing supplies and by using various technical fixes. However, this can lead us into a situation in which excessive structure and centralization are needed to meet our energy goals. If increased energy supplies is the answer, then what is the question?

Soft energy paths not only emphasize vigorous conservation and the use of self-renewing resources, but attacks the structure of our energy system itself. Its emphasis is on diversification and intermediate level technology and seeks to allow man more choice in his own affairs. This approach will be reviewed. Our responsibilities in shaping an energy-dependent society in which human goals are valued, rather than thwarted for the sake of economic growth and energy "independence", will be examined.

JAMES, EDASSERY V. - Purdue University, Hammond, Indiana
 "Implications of Behavior Setting Theory to Stewardship of the Environment in Daily Life"

Roger Barker's Ecological Psychology and the theory of Behavior Settings are set in the framework of General Systems Theory and observational research. Since the concept of Behavior Settings encompasses the physical as well as psychological attributes, an elaboration of the theoretical propositions and research findings leads us to consider the interrelationships among the programs, behavior, social climate and physical design of the settings. It is possible then to apply such concepts to the design of settings to strengthen wise stewardship of environment in the day to day activities within many behavior settings.

KELLY, WILLIAM L. - Birmingham, Michigan
 "Human Rights - A Basis for Christian Action or a Trap for the Unwary?"

Reflective Texts: Matt. 15:9; Luke 11:35 The subject of "Human Rights" is examined from both philosophical and Christian perspectives. The author argues that there is neither a philosophical nor a Christian basis for "Human Rights" as a fundamental principle of Christian Action.

KOTESKEY, RONALD L. - Asbury College, Wilmore, Kentucky
 "Toward the Development of a Christian Psychology: Comparative and Physiological Psychology"

Several years ago I proposed a basis for the development of a Christian psychology, an extension of a perspective developed by Francis Schaeffer. This perspective

shows how humans are similar to animals in some ways because they are created beings, but also similar to God in others because God made humans in his image. Secular comparative and physiological psychology fit nicely into this perspective and the perspective also suggests some extensions.

Secular comparative psychology has emphasized how humans are similar to animals. Both American comparative psychology and European ethology have made comparisons within species and between species, including comparisons of animals to humans. Similarities have been stressed. A Christian psychology accepts these comparisons with appropriate cautions and suggests that comparisons should also be extended to between humans and God. A. W. Tozer's list of the attributes of God is a good place to start.

Secular physiological psychology has also emphasized how humans are similar to animals. Humans are similar to animals in neuroanatomy, neurophysiology, sensation, learning, and biological motivation. A Christian psychology also accepts these comparisons with appropriate cautions and suggests that since humans are also spiritual beings we need a spiritual psychology which emphasizes God-like aspects of humans. Remarks are made about the incarnation, human bodies as spiritual temples, and the body of Christ.

In conclusion, both comparative and physiological psychology as studied by secular psychologists stress human similarities to animals. A Christian psychology must be extended to make comparisons between humans and God and a spiritual psychology analogous to physiological psychology must be developed.

LEITH, THOMAS HARRY - York University, Downsview, Ontario, Canada
"Explanation, Testability & The Theory of Evolution"

The paper examines the nature of scientific explanation as it is understood in the physical sciences & compares this with explanation as employed in evolution. Specifically, it assesses the argument that evolutionary explanation is narrative in character because of the uniqueness of the events which it interprets and the different argument that evolution does not explain scientifically at all. The latter view encompasses both the thesis that evolution merely arranges facts in a meaningful order & the idea that it is a metaphysical scheme. Neither takes evolution to be testable.

If, as I attempt to show, evolutionary explanation is in the same style as explanation in physical science then I must be expected that it will also make testable predictions. The relationship between explanation & prediction as well as postdiction is therefore explored within evolution & certain distinctive problems are noted.

I then turn to an analysis of explanation & prediction in Darwin's scheme & in contemporary neo-Darwinism. While it is clear that theoretical concepts within both may lack some of the precision expected in the physical sciences, & while evolutionary laws have unique problems, I conclude that the theories of evolution widely employed over the last 120 years are testable & have been tested. The reason why many deny this is not entirely due to the errors noted above but also arises from a failure to understand the particular sort of prediction which evolution usually makes.

My paper is, therefore, not a discourse on the pro's & con's of any evolutionary theory but an attempt to clarify what evolutionary theories are & what they can & can't do. I find them, in spite of their peculiar limitations, quite scientific.

LUBENOW, MARVIN L. - First Baptist Church, Fort Collins, Colorado
 "Surtsey: A Micro-Laboratory for Flood Geology"

The Contemporary Evangelical debate over "Flood Geology" centers upon the legitimacy of extrapolating present-day rates of geologic processes into the past, and using this extrapolation to challenge the possibility of a significant portion of the earth's sediments and fossils being the result of the Noahic Flood of Genesis 7-9. The problem is complicated by the impossibility of repeatable experiments or present-day observations on a flood that is thought to be a singularity, of world-wide extent, and of over one year in duration.

The birth, in 1963, of the volcanic island, Surtsey, off the coast of Iceland, may cast some light on the problem. Since Surtsey's birth was both unique and spectacular, most works on geology make mention of it. Only two Icelandic scientists write about what may be the most significant geological factor of all--the development of a mature landscape in days or weeks on Surtsey that would normally take thousands of years elsewhere. Since the two geologic forces operating on Surtsey--volcanism and marine action--are also two of the forces thought to be in operation during the Noahic Flood, Surtsey may be as close as one can come in the natural world to a micro-laboratory for "Flood Geology."

LUCAS, CHARLES W. JR. - Smithsonian Science Information Exchange, Inc. Washington, D.C.
 "Soli Deo Gloria"

All the modern sciences are based on key philosophical assumptions that were expressed and defined primarily by men who never honored or worshipped God. As a result neither physics, nor astronomy, nor chemistry, nor biology, nor psychology, nor sociology, nor any other modern science properly acknowledges God and his role in the universe. Some of the most important philosophical assumptions of modern science will be singled out, and it will be shown how they each deny the existence and deity of God. The role of the Christian scientist in this situation will be developed from the scripture. An example of how Christian scientists should proceed by faith will be given.

MARTIN, JOHN H. - Sheaffer & Roland, Inc., Chicago, Illinois
 "Identification of Tasks in Exercising Good Management of Energy Resources"

Responsible management of our resources of energy must employ a wide variety of technical and institutional disciplines. The need for such management has been dramatized by the recently recognized threats to the cost and availability of energy. The impact of this observation is especially great in the United States since we are such lavish users of energy and our life-styles have been built upon its being cheap and abundant. Energy use schedules cut across nearly every aspect of our society.

It is useful to identify a certain hierarchy of energy management measures. For reason of cost effectiveness and simplicity the first building design choices to be made result in the conservation of energy by use of better wall insulation, better control of ventilation, conservation of water, etc. Almost as simple and cost effective are measures to regulate the radiative, conductive, and convective coupling between the inside and outside of buildings. These measures, combined with heat storage, make up what is sometimes referred to as passive solar harvesting. Where fine tuning of the built environment is called for, heat pumps with heat storage and solar collectors permit a large reduction in the quantity of energy which is purchased.

Satisfying our needs for fuels and concentrated dissipation of high quality energy must also be subjected to conservation, supply, and use strategies of responsible design. Operations which require high quality or high temperature energy often yield waste heat which is useful for other operations, avoiding the waste of thermodynamic advantage by mismatch in energy quality between supply and demand.

In this paper will be identified specific task areas which need to be addressed to improve our options in exercising good management of energy resources. These tasks will include energy in many forms, such as heat, light, electricity, motive, and food. The impact areas will include physics, chemistry, biology, economics, and politics.

MYERS, DAVID and LUDWIG, THOMAS - Hope College, Holland, Michigan
 "Coping With a No-Growth Economy: Insights from Psychological Research"

Evidence from many sources suggests that the era of rapidly rising prosperity may be nearing an end. Experts predict that America may soon undergo a "belt-tightening" which could necessitate far-reaching changes in life-style and career aspirations. Some individuals have already adopted a life-style of "voluntary simplicity," but for others the transition will undoubtedly be traumatic. This paper will discuss three findings from psychological research: a) the adaptation-level principle, which suggests that success or failure, satisfaction or dissatisfaction, is not measured on an absolute scale, but is relative to our prior experience and to what we observe people like ourselves receiving; b) the finding of positively biased self-perception, which indicates that people generally perceive themselves as more admirable and deserving than other people in their groups; c) the phenomenon of upward comparisons, which suggests that when people are given an opportunity to compare themselves with various other people like themselves, they generally choose to compare themselves with people whose rewards have been superior rather than inferior to their own. These findings can help us understand the psychological trauma and discontent that will accompany (and is already accompanying) the slowing of economic growth. The paper will also offer some suggestions as to how we might smooth the transition in our own lives if a no-growth economy becomes a reality.

NEUHOUSER, DAVID L. - Taylor University, Upland, Indiana
 "Love and Logic"

God loves. God is logical. God has integrity.

Therefore, there is a relationship between love and logic.

The conclusion given above is valid. That is, it follows logically from the premises. I realize that it would be an invalid conclusion to say that I understand that relationship. Nevertheless, I have tried to explore relations between love and logic.

First of all it would be nice if love could be completely defined, but we realize from a study of mathematics that not all words can be defined without circular definitions. At least the concept of love should be clarified as much as possible. I Cor. 13 gives an analysis of love. C.S. Lewis' book The Four Loves gives another. Love is more than an emotion. It is an affair of the will that includes a sincere desire for the welfare of the object of that love and a willingness to personally work and sacrifice to achieve that welfare.

Many people have a warm emotional affection for someone but through thoughtlessness do not promote that persons welfare. Reason must guide that emotion for it to be effective. That is, to be logical may be the best form of love.

Christianity is a reasonable religion. There are many ways of showing this, but Jesus in his prayer recorded in John 17 tells us the best way to show that Christianity is true. He says that if Christians have unity or love among themselves as the Father and Son have, then the world will know that Jesus was sent from God and that God loves them. That is, to show the world that Christianity is true, the best logic is love.

A conclusion is valid or invalid depending on the premises or axioms. To say that it is not logical to love people who deliberately harm us may be true if our axioms are purely humanistic or materialistic. But, if we start with Christian axioms it is surely logical to love our enemies. It is emotion, not logic, which makes it difficult to do so.

REDMOND, MICHAEL D. - Valley Road Covenant Church, Montclair, New Jersey
 "Rational Self-Interest and Public Goods: A Philosophical Study"

At last we are beginning to realize as a nation of people that we must protect our natural resources. Unless we do so our lakes, streams and air will be irreparably polluted and crucial energy sources like oil and gas will be exhausted. Let us call these things public goods - goods which are available to the public indiscriminately. If these public goods are to be protected, however, it will require not sporadic individual effort but a cooperative group effort. Only if a large group of people cooperate together - picking up litter, turning down thermostats, etc. - will public goods be preserved.

Tradition theory of group motivation asserts that it is rational self-interest which causes individuals to cooperate for the sake of the common good, the protection of public goods, in this case. Indeed, the notion of rational self-interest is a basic motif of capitalism and a democracy like ours. It is assumed that if people do the rational self-interested thing, that is, protect their own interests, in the long run the common good of the group will be served.

It is my thesis that the tradition theory of group motivation is in fact, false. Rather than moving individuals to cooperate thereby bringing about the common good, I argue that the rational self-interested thing to do in terms of protecting public goods like natural resources is not to cooperate. Consequently attempts to protect these goods by appealing to the individual's rational self-interest are doomed to failure.

This thesis is argued for philosophically and illustrated with actual events, past and present.

In the conclusion of the paper I suggest that for the Christian biblical doctrines of creation and stewardship provide the motivation which rational self-interest fails to give for protection of our natural resources and public goods. Some attention is given to the "group consciousness" of Christianity. In light of the failure of traditional group theory to protect public goods some implications are drawn for political action.

RIDLEY, DENNIS R. - SUNY, Geneseo, N.Y. & JOHNSON, D. E. - University of Arkansas
 "Basic Psychological Research and the Challenge of Integration"

Past discussions on integrating psychology and Christianity have conspicuously neglected the large body of reliable knowledge in psychology generated by basic research. Our thesis is that basic research activity is important for psychologists interested in integration. Many discussions, we noted, assumed that psychology should be "rebuilt" to have direct bearing on the human condition, aid personal adjustment in modern society, and have its presuppositions corrected to tally with a Christian world-view. As Christians and active researchers, we wish to question these assumptions.

Aside from the improbability that such reconstruction efforts will have the desired effects upon psychology, attempts to influence psychology will be most effective within the context of full appreciation for its intellectual accomplishments. That involvement in basic research develops this appreciation and effectiveness is suggested by the following points. First, an active researcher must apply the tools of inquiry of the discipline, learn and build upon past research, and submit to evaluation by colleagues. Secondly, doing research can sensitize one to problems of fitting data into theoretical frameworks and make one aware of winds of change within the discipline. Thirdly, one's credibility and influence within psychology is proportional to one's substantial contributions to the discipline. Finally and most critically, one who participates in what psychology actually is rather than prescribes what it ought to be can become a "living integration" by striving in one's whole mind to relate this absorbing activity and its fruits to the most important fact of life, being a Christian. We close with attempts to illustrate this process. "Prolegamena to all future integrations" inhibit these efforts.

ROBERTS, FRANK - Delaware County Christian School, Newtown Square, Pennsylvania
 "Ecological Crisis: How Did the Fall of Man Affect Creation?"

The Scriptures nowhere directly state that the non-human physical or biological creation was intrinsically affected by the fall of man. In Genesis three, man is put out of the garden into the rest of the world, where thorns and thistles were already growing. In the eighth chapter of Romans, creation is said to have been subjected to frustration, to groan in pain, and to be about to be liberated from its bondage to decay. It is suggested that the word "creation" is used here in the same sense that it is used in Colossians 1:23, and thus refers to people, rather than to animals, trees, and rocks. It is the human race that is being described.

Man's fallen nature does, however, have an effect on creation. Although God gave man dominion over creation, making him the steward or caretaker of creation, his basic sin nature leads him to selfishly misuse his technology, unnaturally affecting the environment. Rust, decay, earthquake, flood, and volcanic eruption are chemical, biological, and geological processes, created by God, and are not the result of the fall of man or even of Satan. In this connection one must distinguish between natural "catastrophe" and moral evil. When a city is inundated by a flood, the event would be described as evil only in the sense that human error led to construction on a flood plain. The occurrence of the flood is a part of God's natural creation. After all, God made the flood plain by successive floods in the past.

In the first chapter of Genesis it several times says that God saw that what He had made was good. Creation still is good, although it has been adversely affected by people whose nature is not good.

RYND, JAMES A. - Biola College, La Mirada, California
 "Sources of Conflict in the Integration of Science and the Bible"

The theme "All truth is God's truth" is the basis of the integration of revealed truth and derived truth. What then is the particular relationship between the Biblical view of the physical world and science? Are they both independent but equally authoritative sources, or is one dependent upon or subservient to the other, or are they working at different levels of truth and thus cannot be related.

If the integration process is to be successful, one must avoid several misconceptions as to the nature of science that have led to unnecessary conflict. The first is that the philosophy of science and scientific roles cannot be self derived. The second is to confuse scientific law with causality. The third is to think of scientific theories as reality. The fourth is to assume that science is objective.

Errors in logic can also lead to conflict between the Bible and science. Some of these are definitions, correlations, extrapolations and the naturalistic fallacy.

A possible starting point for the integration process will also be discussed.

SCHLOSS, JEFF - Washington University, St. Louis, Missouri
 "Population Control and World Hunger"

Models involving biological determinism have long been used in attempts to explain complex sociological phenomena; the malthusian model argues that human populations are inclined to increase at a rate much higher than that of their food supply. Historical records indicate that variations of this position have been advanced as explanations for human hunger as early as several millenia before Malthus; however, no substantial evidence has ever documented the correctness of this view.

The biological explanation for world hunger continues to influence food policy and public opinion, in spite of the fact that most authorities agree that the majority of human malnutrition is not due to deficits in production. Population control the "green revolution", and the effect of the media in popularizing these approaches in this country are briefly examined. Distinctively Christian responses to hunger and the proper understanding of hunger are discussed, and the contacts of examining how believers can influence the acceptance of life styles which acknowledge responsibility.

THAXTON, CHARLES B. - Probe Ministries, Dallas, Texas
 "The Role of Intelligence in Prebiotic Simulation"

It is widely accepted in the scientific literature that naturalistic simulation of prebiotic events at the biomonomer level has been demonstrated. Hence the conclusion is now well entrenched that a naturalistic origin of life scheme such as that first proposed by Oparin and by Haldane in the 1920's is plausible.

There is, however, no direct geological evidence for this origin of life scheme. In addition, serious questions can be raised about the indirect simulation experiments. I shall argue that in these "simulations," intelligent, exogenous manipulation of reaction conditions and materials has been performed unwittingly by the experimenter. Specifically, I shall show how the investigator has violated naturalistic canons for prebiotic simulation by using selected chemicals, selected energy sources, and trapping techniques. These contributions of the investigator play a significant role in experimental success. Prebiotic simulation at the biomonomer level has yet to be demonstrated. It is fair to conclude that without more rigorous adherence to the

naturalistic canons for prebiotic simulation the basis of plausibility for the naturalistic scheme of life's origin has been removed.

THURMAN, L. DUANE - Oral Roberts University, Tulsa, Oklahoma
 "The Basis for Christian Giving to the Poor and Hungry"

We receive many appeals to help the poor and hungry of the world. Yet we do not have enough resources to meet all current requests, and will be even less able to handle the rapidly escalating future needs. What criteria should we use to guide us as individual Christians and as a Christian nation in determining who should receive this limited aid? And is our aid the kind and amount of real help that contributes to effective, long-term solutions or is it merely a temporary "solution" which eventually increases the severity of the problems? The relative importance of politics, compassion, sympathy, ecological principles, Scripture (e.g. Matt. 25), and the leading of the Holy Spirit are considered as guidelines to help establish lasting solutions for the needy.

VAN DELLEN, KENNETH J. - Macomb County Community College, Warren, Michigan
 "Induced Abortion: A Christian Solution?"

Since the infamous ruling of the U. S. Supreme Court on January 22, 1973, there have been over 7,000,000 abortions (estimated). Various arguments have been advanced as to why abortion should be legalized, but there has been little publicity about the adverse effects of abortion. These effects include the physical effect on the unborn, physical and psychological effects (both short- and long-term) on the mother, and effects which the pro-abortion kind of mentality has on society.

There are a number of approaches which responsible people can take to counteract the growing problem of abortion and other kinds of disregard for life.

WALKER, LAURENCE C. - Stephen F. Austin State University, Nacogdoches, Texas
 "Stewardship Dilemmas in Natural Resource Management"

Administrators of natural resource use will continue to be blamed for mismanagement of those resources as those resources continue to be mismanaged. They will also be blamed for appropriately made decisions if certain publics are uninformed of the reasons for these decisions. Hence what appears as an improper judgment is often the balancing of economic and ecologic factors to provide for "the greatest good of the greatest number in the long run."

Clearcutting of forests is ugly, may result in some erosion, and for a period alters the vegetative and animal life of the site. It is necessary because most commercial forest-tree species require a mineral soil for seed germination and full sunlight for growth.

Water reservoirs are often the sinks into which pollutants are dumped, energizing algal growth. These plants, themselves pollutants, can be controlled by opening the reservoir to water-skiing, thus oxidizing the nutrients on which they depend; but then motor oil coats the surface of the lake.

Deer, in the absence of predators--now generally the case--overbrowse their habitat. Controlling the herd population by hunting is considered by many as unsportsmanlike. Alternatives are expensive trapping and butchering for food or permitting the self-destruction of the herd and its individuals.

Energy searchers have their dilemmas, too. Whether geothermal, oil, gas or coal, land abuse and restoration are trade-offs to be considered if we're to keep warm, or cool, or to travel to meetings such as this.

WANG, BEE-LAN C. - Wheaton College, Wheaton, Illinois
"Population Issues, Demographic Theory, and Christian Response"

If the human population is at or near the carrying capacity of the earth, then utilitarian ethics dictates that the few rich should not feed the many poor because that will only reduce death rates among the hungry and result in increased numbers of miserable people in the future. The carrying capacity having been exceeded, it will be impossible to feed the starving then. However, the Bible clearly commands us to feed the hungry. Are biblical commands foolish?

Population growth has commonly been viewed from the perspectives of classical Malthusianism, technological optimism, environmental crisis, demographic transition, and distributive justice. These positions are examined in the light of historical data and current social research, and their philosophical assumptions evaluated on the basis of biblical teaching. It is concluded that God's commands in this area are neither arbitrary nor anti-utilitarian if followed to their fullest intent.

WIANT, HARRY V., JR. - West Virginia University, Morgantown, W. V.
"Is Clearcutting a Responsible Forestry Practice?"

The history of clearcutting is reviewed, and ecological and economical justifications for its use are given. Objections to this practice and the dilemma for professional foresters are discussed.

WILKINSON, LOREN - Oregon Extension, Trinity College
"The Incarnation as a Model for Human Care of Creation"

Scripture portrays man as being not only in nature, but above it. One consequence of this human transcendence over nature is God's command, and man's ability, to have dominion over the rest of creation. Since the Fall, man has increasingly understood dominion to mean his power over creation, at the expense of his care for it. But a principle theme of Biblical revelation is that dominion is the basis for service. The central example of Divine dominion is the Incarnate Christ, who, grasping not at His infinite superiority over man, became man for the sake of his salvation. The example of Christ is thus helpful for Christians who seek to understand how they should treat the natural world. "Dominion", for them should be not merely a license to use creation as a raw material, but the basis for a self-giving and redemptive affirmation of all that is within their care.

WOODSIDE, EDMUND R. - Pasadena, California
"The Plymouth Brethren and Creation"

Leaders among earlier Plymouth Brethren wrote during the period when there was much controversy in church circles over creation. While their principal efforts were in other directions, the subject did find a place in their prolific writings. Darby felt that man entered the world hardly in the state God created it. Geologists did not affect the statements of Scripture one way or the other. Grant is accredited with gaining much of his thought from Dr. Hugh Macmillan, a British clergyman, who

wrote speaking of the earth, "she has lifted up the dark curtain that concealed the history of primaeval times and permitted us to study in her rocks and fossils the revolution of millions of years." In the next generation, Samuel Ridout wrote, "Science tells of unlimited periods of time in which the earth has passed through various stages of progress." In summary, leaders of the Brethren viewed the earth in terms of lengthy geological sequence. They did not hold any "late earth" theory as being taught by some today.

YAMAUCHI, EDWIN - Miami University, Oxford, Ohio
"Ancient Ecologies and the Biblical Perspective"

The paper will survey the cosmologies of the ancient Mesopotamians, Egyptians, and Greeks and compare them with the biblical perspectives of the Hebrew Scriptures. We shall seek to determine how these ancient societies viewed the origins and the natures of the universe, the planets and stars, mountains, oceans, plants, animals, and mankind. How did the biblical view differ from contemporary outlooks?

We shall then focus on examples of two particular natural phenomena: droughts and locusts. How did the writers of the Old Testament view these calamities?

Finally, we shall inquire about the New Testament materials to ascertain developments in the early Christian attitudes toward creation, the universe, nature, and the final eschatological fulfillment of God's plans.