

R. Moberg

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

AMERICAN SCIENTIFIC AFFILIATION

49TH Annual Meeting
July 29 - August 1, 1994
Bethel College
St. Paul, MN

BIOETHICS: PROMISE AND PERILS

Keynote speaker

Dr. John F. Kilner

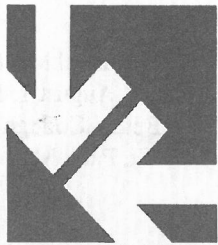
Director of the Bannockburn Institute
for Christianity & Contemporary Culture
Bannockburn, IL

and
Associate Professor, Bioethics & Contemporary Culture
Trinity Divinity School

Deerfield, IL
and

Adjunct Professor of Medicine
Northwestern University
Chicago, IL

But the wisdom that comes from heaven is first of all pure then peace-loving, considerate, submissive, full of mercy and good fruit, impartial and sincere. Peacemakers who sow in peace raise a harvest of righteousness. James 3:17, 18 NIV



Friday, July 29, 1994

- 11:00 - 3:30 PM Field Trips - Biology and Geology
- 2:00 - 9:00 PM Registration at PE Lounge
- 5:30 - 6:15 PM Dinner

Robertson Center Gymnasium FA 313

- 7:30 PM Conference Introductions
Opening and Welcoming Remarks
Dr. George Brushaber - President of Bethel College and Seminary, and Editor of *Christianity Today*
- 8:00 - 9:00 PM Dr. John Kilner - *Wesleyan, at Asbury Sem. + U Ky. Hale U; Gordon-Conwell; Harvard Ph.D.*
"Bioethics, Belief, Battles, and Brains"
Rock Ridge Ctr., New NW Univ, Trinity E.D.S., etc
- 9:00 - 10:00 PM Mixer - PE Lounge

Saturday, July 30, 1994

- 8:00 - 8:45 AM Breakfast
- Robertson Center Gymnasium FA 313**
Russ Westman - Ukraine
- 9:00 - 9:30 AM Devotions - Dr. *Walter R. Hearn* *Jonah 4:9-*
Music - Larry and Sue Martin
- 9:30 - 9:45 AM Conference Announcements
- 9:45 - 10:45 AM **Dr. John Kilner** - "Life on the Line: Faith and Physician-Assisted Suicide"
- 10:45 - 11:00 AM Coffee Break - PE Lounge
- 11:00 - 11:45 PM Case Study Discussions (5 groups) *DOM -* FA 313; FA 312; AC 333
Marlyse
- 12:00 - 12:45 PM Lunch
- 1:30 - 2:30 PM Parallel Sessions
- 1:00 - 3:50 PM Note time schedule differences for Creation Symposium:
"Is the Neo-Darwinian Mechanism of Natural Selection Acting on Random Mutations Adequate for the Creation of New Major Biological Innovations?"

Saturday, July 30, 1994

TIME	BIOETHICS: I FA 313 R. Brand*	SHARING & CARING: I FA 311 K. Olson*	TIME	CREATION SYMPOSIUM FA 312 D. Wilcox*
1:30-1:50	A. Truesdale - A Preface to Bioethics: Foundations For A Christian Approach to Bioethics	M Root - Stewardship of Animals in Research: Ethics and an Example	1:00-1:35	K. Miller - Taxonomy, Transitional Forms and the Fossil Record
1:50-2:10	D. Sas - Priorities in Biblical Bioethics	G. Mills - A Theory of Theistic Evolution	1:35-2:10	J. Wiester - Testing the Predictions of the Neo-Darwinian Mechanism Against Macro-Pattern in the Fossil Record: Verification or Falsification?
2:10-2:30	W. Hurlbut - Cosmetics and Cosmology: African Adornment, Christianity and Biomedical Techonology	R. Myhrman - The L-DOPA Content of Twelve Varieties of Velvet Beans	2:10-2:25	Symposium Coffee Break
			2:25-3:00	T. Gray - Complexity - Yes! Irreducible - Maybe!
2:30-3:00	Coffee Break - PE Lounge		3:00-3:35	M. Behe - Darwin's Criterion: Irreducible Complexity
			3:35-3:50	D. Wilcox - Closing Remark

Saturday, July 30, 1994

TIME	BIOETHICS: I FA 313	SHARING & CARING: I FA 311	POSTER SESSION AC 331	C R E A T I O N S Y M P O S I U M
3:00-3:20	J. Hollman - Medical Ethics in a Pluralistic Society	J. Behnke - Teaching "Ethical Issues in Science" at Asbury College	L. Dennison - Gravel Quarries Refuse Quaternary Explanation: (Poster)	
3:20-3:40	S. Rice - Ethics and the Role of the Prophet	P. Anderson - Xenotransplantation: Homology Criteria and the Statistical Mechanics of the Recipient Survivability Cycle	F. Fleming - Caring for People in the Undergraduate Laboratory (Poster)	
3:40-4:00	G. Hess - The Bioethics of Biological Determinism		K. Dormer - Annual Report of the AISRED Development (Poster)	

*Session Chair

Family Field Trips -
Minneapolis Valley National Wildlife Refuge
or
Mall of America

Tim Shaw
Bob Kistler
Kerna Johnson
Bob Clackner
Conf. Etc.
Bethelrefs.

4:00 - 5:00 PM ASA Business Meeting - FA 313
6:00 - 8:00 PM Banquet - Robertson Center Gym
8:30 PM Biologists Business Meeting - FA 313
Geologists Business Meeting - FA 312
9:30 PM Open Session - Biology - FA 313
Behe, Mills, Bowman - Panel Discussion on Origins

Sunday, July 31, 1994

- 8:30 - 9:15 AM Breakfast
 10:30 AM Church Service - Seminary Chapel FA313
David Swift - CDs, Larry Martin - music, Choir
 Dr. David Moberg - speaker
- 12:00 - 12:45 PM Lunch
David Zischer
 Robertson Center Gymnasium FA313
- 1:15 - 1:30 PM Conference Announcements
- 1:30 - 2:30 PM Dr. John Kilner - "When the Inevitable is Intolerable: Rationing, Reform and the Role of Christians"
- 2:30 - 2:45 PM Coffee Break - PE Lounge
- 2:45 - 4:25 PM Parallel Sessions

TIME	BIOETHICS: II FA 313 F. Hickernell*	SHARING & CARING: II FA 312 R. Herrmann*
2:45 - 3:05	J. Hollman - The Normal Aging Process and the Implications for End of Life Decisions	M. Meyer - The Moss Scopelophila and Heavy Metal Contaminations: Analysis of Genetic Variation
3:05 - 3:25	H. Bouma - "Take My Life, Please!" - Moral Issues in Physician-Assisted Suicide	D. Cain - Genesis One: Literal Days and Concealed Ages
3:25 - 3:45	T. Shaw - The Human Brain and the Biology of Ethics, Morality and Sin	D. Giesler - The Ear's Design As a Signpost of God's Wisdom
3:45 - 4:05	W. Monsma - Animal Rights and the Bible	R. Bohlin - Human Cloning
4:05 - 4:25	R. Miller - The Ethics of Public Health Research: a Case Study of EMF	R. Bohlin - The Natural Limits to Biological Change

*Session chair

- 4:30 - 5:15 PM Second Case Study Discussions (FA 313; FA 312; FA 311; AC 328; AC 329)

5:00 - Dinner w/ Jasses 7-10 pm - Reception at Calvary Bapt. Ch.

- 5:30 - 6:30 PM Dinner

FREE TIME - Visit local churches, or friends, watch video on Bioethical Case Studies, Discussion Groups

Monday, August 1, 1994

- 8:00 - 8:45 AM Breakfast
 Robertson Center Gymnasium FA313
- 9:15 - 10:15 AM Case Study Report - Dr. James Peterson
- 10:15 - 10:30 AM Coffee Break- PE Lounge
- 10:30 - 11:30 AM Parallel Sessions

TIME	MISCELLANEOUS FA 313 E. Zipf*	HISTORY OF SCIENCE FA 312 D. Wilcox*
10:30 - 10:50	L. Martin - The Hermeneutical Dilemma - Can We Read Nature?	M. Mills - Science in the Pre-Classical World (3500 B.C. - 500 B.C.)
10:50 - 11:10	J. Greenberg - Competing Interests and the Lifeblood of Paradise	J. Haas - Five Years of Perspectives

*Session Chair

- 11:30 - 12:00 PM Communion and Prayer - FA 313 Rev. Merlyn Bilhorn
- 12:00 - 12:45 PM Lunch

Close of conference - Please return your key and name badge. Thank you!

The ASA would like to extend our thanks to Program Chair, Donald Munro, and Local Arrangements Chairs, Tim Shaw and Bob Kistler for their support to this year's Annual Meeting.

How maintain diversity & flexibility of HC system.
In France when pg. of come in for 9 free checks, will
pay \$1,000 to person - not effective because few;

Ltr to Bob Herrmann
to Carol Aiken, ASA office. D. Moberg

Shalom-2 | costly low weight births.

AMERICAN SCIENTIFIC
AFFILIATION

ABSTRACTS

BIOETHICS:
PROMISE AND PERILS

Bethel College
St. Paul, MN

July 29 - August 1, 1994



ABSTRACTS

of the
Annual Meeting
St. Paul, MN
July 29 - August 1, 1994

XENOTRANSPLANTATION: HOMOLOGY CRITERIA AND THE STATISTICAL MECHANICS OF THE RECIPIENT SURVIVABILITY CYCLE

Philip E. Anderson
Hampton Falls, NH

Cross-species organ transplantation or xenotransplantation was initiated about 1963. There was only short term survival for all xenotransplantation recipients. In 1964, the human recipients received chimpanzee and baboon kidneys. In the 1984 Dr. Bailey Baby Fae case, and the 1992 Dr. Starzl case, the human recipients received a baboon heart and a baboon liver respectively. The purpose of this paper is to seek more knowledge about the viability of this transplantation procedure. An attempt will be made to clarify the supposed homologous or concordant relationships between the recipients and donors in the 1984 and 1992 cases. Recent studies question the interpretation that all similar protein sequences necessarily mean a common ancestral descent. Moreover, the term "homologous" which differs from "similarity" cannot be qualified, and so to speak of "degree of homology" is without sound mathematical basis. In measuring "similarity", the use of "per cent identity" is ad hoc in nature. "Mutual entropy" is the measure of "similarity" where "entropy" is the Shannon entropy of information theory. It is not to be confused with the Maxwell-Boltzmann-Gibbs entropy of statistical thermodynamics or statistical mechanics to which it is not related. Also, the Jonasson and Hardy scientific evaluation of the Baby Fae case will be extended by a statistical mechanical state of the system evaluation involving an extended application of the basic Gange interpretation of the "New Generalized Second Law" of thermodynamics to the recipient survivability cycle where vital information density is the pertinent observable.

TEACHING "ETHICAL ISSUES IN SCIENCE"
at
ASBURY COLLEGE

James Behnke and Frank Wilbur
Abury College
Wilmore, KY

We instituted the above named course three years ago in an effort to increase the ethical awareness of our Biology and Chemistry majors. We had an earlier, more theoretical course that attempted to do the same thing, but it became evident that introducing the theory of ethical decision making to the students did not have the desired influence on the students' behavior. In an attempt to affect some change in the students' behavior, we introduced three key changes in the course design. The changes were an intentional focus on the teachings of scripture, utilizing case studies immediately relevant to the students and using the book Shaping Character by Arthur Holmes as a text.

We feel that the increased focus on scripture was vital to the success of the changes. The normative role played by scripture in the life of the Christian is discussed in detail. Students are also required to write a paper discussing the life of a Biblical character and what that person's life teaches about ethics. Surprisingly, the exercise of examining the life of a person from the Bible seemed to be new to the students. Finally, the concept of Shalom as a guiding paradigm in the ethical life of a Christian is discussed extensively.

The case studies relevant to the students are important, too. The first study involves a student whose roommate needs assistance in breaking some of the dorm-life rules of the college they are attending. In the second case study, the same student is confronted with the problem of whether to include a variant experimental result in the laboratory notebook, which would probably reduce grade her slightly. In the third case study, the student has graduated and is employed by a possibly unethical employer. She has uncovered a potential environmental hazard related to company procedures and doesn't quite know what to do. In addition to discussing these case studies, each student must write a paper that analyzes a situation from her/his life; this seems to have a strong impact on the students' recognition that there are significant ethical dimensions to everyday life.

The text Shaping Character is an excellent book for this course. It discusses ethical theories, the process of decision making, the role of scripture in

decision making and a variety of other topics related to ethical formation. The book is sufficiently readable and well written that it is not difficult to engage the students in discussion of the points raised by Dr. Holmes.

We are pleased with the results of our course changes. Student comments on the course evaluations and on the final exam show their pleasure with the course. By the end of the course, the students seem genuinely interested in ethical decision making; they appear to have internalized the concepts and principles discussed in the class. We feel that this course might be one of the most important of our students' undergraduate career.

HUMAN CLONING

Raymond G. Bohlin, Ph.D.
Probe Ministries
Richardson, TX

Reports of human cloning in early October 1993, by researchers Robert Stillman and Jerry Hall from George Washington University sparked a firestorm of controversy. There are serious questions about the ethical legitimacy and potential abuses that could result from this line of research. Stillman and Hall rather than cloning humans, actually attempted a procedure for artificial twinning of early 4-8 cell stage embryos. This procedure has been successful in other animals for years, but Stillman and Hall were the first to attempt it in humans. To many this is simply the next logical step after *in vitro* fertilization. There are numerous ethical questions concerning this procedure alone. What has alarmed many however, is the potential uses of the technology. The twinned embryos could be destroyed in the process of genetic tests with the frozen twins available for implantation. Frozen twins could be used as marketable quantities in catalogs using the first twin born as a model. Embroiled in this controversy as well is the whole question of whether there should be societal constraints on scientific research. An analysis of these issues and suggestions for the future will be presented.

THE NATURAL LIMITS TO BIOLOGICAL CHANGE

Raymond G. Bohlin, Ph.D.
Probe Ministries
Richardson, TX

Are minor mutations that have been accumulated over thousands of generations and millions of years capable of producing complex invertebrates where once there were only single-celled organisms? Or human beings were once there only arboreal monkey-like creatures? Or do mutations in fruit flies, as in breeding experiments, produce only a different kind of fruit fly? As new information is gathered about the maze-like complexity of the developmental and genetic machinery and the intricate, yet delicate nature of biological adaptation, the more the traditional evolutionary explanation is questioned. New-Darwinism, though still satisfactory and even compelling to many, is falling into disrepute. Punctuated equilibrium on the other hand seems to be facing equally difficult challenges in establishing itself as a viable biological theory. The available evidence can also lead to the conclusion that there are limits to biological change. While this is an abrupt shift from evolutionary theories, it is an old idea that deserves fresh consideration based on evidence from genetics, development biology, and information theory.

"TAKE MY LIFE, PLEASE"

MORAL ISSUES IN PHYSICIAN-ASSISTED SUICIDE

soon over 1 mil centenarians
2,300 to 2,700 annual Hessel Bouma III, Ph.D.
MD assisted death in Neth. Calvin College
Grand Rapids, Michigan

As our pluralist society rapidly approaches the 21st century, a variety of societal trends are fostering the notion of a "right-to-die." The morality of "right-to-die" issues can be divided into those involving 1) the withholding and withdrawing of medical treatments, 2) ending one's own life, and 3) physician-assisted ending of one's own life. The withholding and withdrawing of medical treatments is permissible when consistent with a patient's informed and competent consent, even to the extent of withdrawing ordinary treatments when a patient's condition is irreversible, terminal, and death is imminent. In contrast, with the notable exception of "benevolent suicide," the ending of one's own life has traditionally been considered a morally reprehensible act. Are there, however, instances of such profound pain and suffering which are medically irremediable short of

motives: arrogant defiance of God *scripture hask + samson*
Escape
Despair
Benevolence
4 *suicides.*

unconsciousness to warrant one's choosing to end his/her own life? If so, may the assistance of health care practitioners be sought to accomplish this end as effectively as possible? Four issues should be addressed before physician-assisted suicide or voluntary euthanasia are permitted: 1) Is there unbearable and medically irremediable suffering and pain? 2) Is modern medicine able to accept dying and death? 3) Should physicians who are committed to curing and caring for patients be permitted to assist in ending their lives? 4) Could the freedom to choose death become a duty to die? In light of the aforementioned, the merits of current guidelines for physician-assisted suicide and voluntary euthanasia will be explored.

Not because unable to cure & unwilling to care.

Pain vs. Suf.

GENESIS ONE: LITERAL DAYS AND CONCEALED AGES

Dallas E. Cain
Engineer, Retired
Scotia, NY

The data of natural science has practically outmoded the interpretations that involve sudden massive miracles. Of options that remain for reconciling Genesis One and natural science, we still have a baker's dozen or more. They fall into four categories:

1. Revelation Days
2. Long Days
3. Metaphorical Days
4. Literal Days and Concealed Days

The most promising options that are found in an extensive literature search are in the overlooked category that incorporates both literal days and concealed ages—the best of all worlds. "It is the glory of God to conceal a matter; to search out a matter is the glory of kings." Proverbs 25:2 (NIV) 1792 Gedes, his translation attaches the days to the next commands; 1875 Warring, puts the days at the completion of the fulfillments; 1902 Capron, puts the commands in the days, and the fulfillments follow; 1971 Dunzweiler, puts the days at the points of essential completion,* 1977 Newman, sees the days as introducing the next commands.* And we still may not have the ultimate explanation on this table.

* The fulfillments overlap like generations in a genealogy, Genesis 2:4a

GRAVEL QUARRIES REFUSE QUARternary EXPLANATION Well Driller, Wooing Water, Delivers Wood

J. Leon Dennison
Quaternary Studies
Olympia, WA

The alluvium of the Western basin valleys indicates that a singular, recent, and powerful event washed gravel and boulders out of the Western mountains and pushed them deep into the basins of large lakes. Boulders and cobbles are found in gravel pits located miles out in the alluvial fill of these former lakes. Clay and silt which should comprise the majority of the volume of the alluvium in the basins, is actually only a small percentage. The shape and slope of the alluvial fans with transition from the mouths of mountain canyons to the floors of the basin valleys are smooth-graded and homogeneous in their alluvial content. The gentle sloping surfaces of the alluvial fans and the gravel content of the basin alluvial fill point to a single hydrologic event.

Drilling operations have brought to the surface, wood and plant debris buried deep in the gravel alluvium. Excavations often expose the disarticulated remains of Pleistocene animals. Disarticulated remains are also uncovered to the wind as it blows away the top cover of dry lakes. The Pleistocene was a time of large numbers and vast herds of well fed animals, not a time of freezing drought. The Biblical flood was the event that created our deep gravel aquifers, built the great glaciers, and caused the extinction of hundreds of Pleistocene mammal species. Ecological policies based on the interpretation of data from Pleistocene deposits could be faulty if the theory about the nature of the Pleistocene is faulty.

CARING FOR PEOPLE IN THE UNDERGRADUATE ORGANIC LABORATORY

Fraser F. Fleming, Ph.D.
Duquesne University
Pittsburgh, PA

The dread of many sophomore students is completing the organic laboratory since students often fear an evaluation more on their practical skills than their academic ability. This is a particularly acute problem for

gifted students with poor practical skills, who would make excellent experimentalists with the right encouragement. For many students this problem is compounded by an individualistic approach to learning where students are sometimes reluctant to share their knowledge because they fear that this will lower their own class standing.

To address these issues a new laboratory course was implemented that strongly incorporates "cooperative learning techniques". Cooperative learning is currently enjoying significant popularity, and relies on students sharing their own understanding and expertise with other students. This approach was developed with a concurrent change from macroscale to microscale experiments making this course completely different from that previously offered. To ensure that this transition was accomplished smoothly, a pilot course was monitored and adjustments made before implementing this relatively large course taken by 250 students.

The three basic elements of the new course are: group quizzes taken before the experiments; encouraging student problem solving and discussion during the lab; and an increased weighting for the grade assigned to the product. Students were encouraged to check procedures and techniques with others in their group during the lab and to continue both lecture and laboratory discussions outside the classroom. Some measure of the effectiveness of this strategy can be gauged from the 25% of students who met outside class time for lab related exercises or for further study.

This paper focuses on factors that allowed this course to be implemented smoothly, with the aim of encouraging others to implement similar programs. The student satisfaction with the course was gauged from a survey that will be discussed, with an emphasis on the effectiveness of using cooperative learning techniques in the laboratory.

THE EAR'S DESIGN AS A SIGNPOST OF GOD'S WISDOM

C. Daniel Giesler
University of Wisconsin-Madison
Madison, WI

The ear of mammals is a wondrous instrument. It captures minute vibrations in air pressure (usually less than 10⁻⁶ variations) and conveys these, with relatively little loss of energy, inside the skull to the

transduction organ, the inner ear. Inside the inner ear, the sound is amplified and its time pattern is translated into electrical impulses which are then sent into the brain. The amplification process, which operates only at low sound intensities, is still not well understood, but increases low-intensity sensitivity nearly 1000 times! This amplification appears to be provided by specialized cells which not only sense vibrations but vibrate themselves at just the right cadence needed to bring amplification. Such a device is beautifully adapted for its jobs and appears to be *very cleverly designed*. This elegance and beauty are not proofs of God's existence, but they are signposts of his power and wisdom.

COMPETING INTERESTS AND THE LIFEBLOOD OF PARADISE

Jeffrey K. Greenberg
Wheaton College
Wheaton, IL

There is a fierce struggle over paradise in the courts and legislature of Florida. The parties in opposition are mainly environmental organizations on one side with developers and agricultural interests on the other; government players have somehow squeezed in between. The future survival of the Everglades and tropical south Florida are at stake. This serves as a valuable ethics study in geoscience.

The abundant flow of ground and surface has been severely disrupted over the last fifty years in south Florida. Drainage for agriculture and flood control has channelized flow mostly eastward into the Atlantic. Only 18 percent of original discharge continues south across the Glades and into Florida Bay. Measurable consequences include a drastic imbalance of salinity in coastal waters which in turn causes destruction of aquatic species essential to food-weed maintenance. Agricultural modification and residential encroachment have reduced the Glades by half. Water from northerly sources through Lake Okechobee is first utilized for sugar cane with the southward contribution of fertilizer and pesticides.

Creation was established with natural systems of equilibrium feedback. Earth systems, much like those of organisms, were designed to function properly within ordained limits of "health". Just as alcoholism or junkfood diets can eventually cause a breakdown in people, corruption

of air or water can be calamitous on a geologic scale. In south Florida the crisis is not a simple conflict between human interests and nature preservation. The situation is a complex of issues pitting established economic interests against scientific data and human as well as non-human ecological health. The reestablishment of natural hydrologic conditions will incur massive expenses. In return, a unique environment can probably be saved along with major benefits as rejuvenated fisheries, stable domestic water supplies, and ultimately, more productive agriculture.

FIVE YEARS OF PERSPECTIVES: a view from the gatekeeper

J. W. Haas, Jr.
Gordon College,
Wenham, MA

The ASA Journal endures because of the faithful work of authors, reviewers, editorial board, office staff, editorial assistant, managing editor and donors who bridge the difference between member and subscription income and the real costs of production and distribution. This paper offers a 'behind the scenes' view of the events that transpire between receipt of a manuscript and appearance in *Perspectives*.

Suggestions are made for smoothing the process of review and escaping the ire of the managing editor. Some comparisons are made with sister publications *Zygon* and *S&CB*. *We wish to encourage writers who will bring fresh insights on contemporary issues to the ASA reader and the broader Christian community. We should be open to dissent, sensitive to history, willing to take chances and bring newly emerging fields under the 'eye of faith.'*

THE BIOETHICS OF BIOLOGICAL DETERMINISM

Oncological reductionism

Gerald D. Hess
Messiah College
Grantham, PA

In the midst of growing concern over the implications of biotechnology for the future of the human race, another related concern has arisen for thoughtful Christians. Biologists are increasingly suggesting the belief that "unlocking the secrets of genes" (as genetic research proceeds) will

abilities of reason, communication, relate to death, anti-epile future, spiri, humu, new

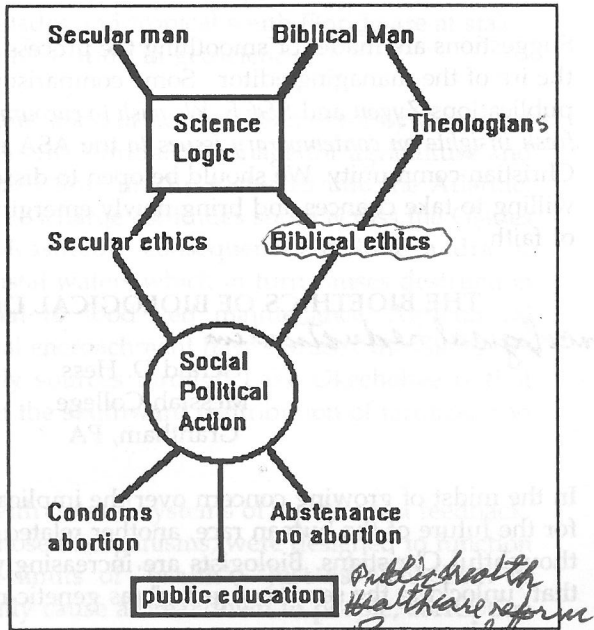
Genes of soul: several genes? from God. Then must find all & how they interact. Mind-body problems possible parallel - Mackay, Clockwork Orange.

require a change in how human nature is understood. While humans tend to see themselves as moral beings shaped by environment and individual choices, identification of genes associated with human behavioral, moral and mental traits suggests that in the future we will be seen as biological beings determined by our genes. But do these implications necessarily lead to the conclusion that our new found genetic knowledge undermines traditional morality and religious belief? Both genes and environment play a key role in shaping our human uniqueness. To be sure, genes exert a profound influence in the development of human abilities to reason, to carry out complicated communications, to anticipate the future as well as the capability to respond as spiritual beings. But this does not preclude the influence of non-genetic factors. Christian believers need to be assured that genetic explanations do not of necessity negate belief in and the capacity to relate to the Creator. Christians need not oppose genetic research out of fear that new genetic discoveries will undermine the fact that humans are unique individuals, created in the image of God. *Also influenced by environment, choice, personality, ability to change.*

**MEDICAL ETHICS
IN A
PLURALISTIC SOCIETY**

Jay Hollman
Ochsner Clinic of Baton
Rouge
Baton Rouge, LA

The recent militancy of some of the members of the pro-life movement have shocked many Christians; the murder of an abortion clinic physician represents an extreme. Taking life in order to save life, is philosophically inconsistent and politically foolish in our pluralistic society. Such actions result in laws that will demonstrate at abortion clinics. They



homosexuality - hate sin, love sinners, harvest ministries.

also convince the pro-choice forces that their cause is morally correct.

Much of the conflict between the Christian and Secular culture in our society has centered at the bottom of this diagram. It is my hypothesis that the battle is more efficiently fought higher in this diagram. If we can, through evangelism, change the Secular man to a Biblical man we are far more effective at changing society. If the Secular man proves resistant to the gospel, then the next site of resolving conflict is in the area of scientific debate and logic. It is here that we as Christians and Scientists need to be more mobilized. We should encourage pluralistic debate on these issues with our Christian and secular colleagues. Certain rules are required for debate in a pluralistic culture; mutual respect for others opinions recognizing that we have different assumptions concerning man, life and death, non violence, humility, honesty and openness to criticisms. The technology explosion increases the number of issues to debate: fetal tissue transplant, genetic manipulation, new reproductive technologies. To set the stage for these debates, we should first state our underlying philosophical assumptions, discuss the scientific facts and use logic to demonstrate how this leads us to ethical conclusions. Each side must agree to listen carefully to the other side's position and first criticize its use of science and logic. Sometimes a common ethic will be possible. When it is not, parallel social programs might be designed to test the effectiveness of each approach. For example a community assigned to abstinence might choose to ban pornography and violent TV and teach abstinence in public schools. A control community might choose to emphasize condoms in schools. End points would be cases of AIDS, use of drugs, safety of the community. *Sci, logic, history*

openness, nonviolence, honesty, sensitivity to assumptions

← Cultural wars from conflicting values

**THE NORMAL AGING PROCESS
AND
ITS IMPLICATION FOR END OF LIFE DECISIONS**

Jay Hollman, *Cardiologist*
Ochsner Clinic
Baton Rouge, LA

The normal aging process proceeds in all individuals and involves all organ systems. The brain and the heart undergo characteristic changes with aging: the heart becomes more stiff or less compliant, narrowing the normal functional range between fluid overload and shock. The heart also loses the fine reflex control of heart rate to external stimuli. The aging brain loses gross mass, the individual brain cell decreases

30% of 75+ are demented.

connections to other brain cells. Moreover the DNA of older cells has more mutations and produces more defective protein. Cardiac cells and brain cells stop cellular division at adulthood. When brain or heart cells are lost in adulthood, they are replaced by non-functioning scar tissue. Even if these cells could be made to divide again by new genetic techniques, the result would still be cells with old DNA. Cellular senescence is well demonstrated in tissue culture, where fibroblasts stop dividing after a fixed number of cell divisions. Cellular immortality is possible only with malignant cells. While medical science has increased the average length of life, the ultimate limits of life, approximately 100 years have not changed. Life still has a biological limit.

The increase in the numbers of elderly will have important implications for the church. If we are to continue to affirm the sacredness of human life, then we must give these people meaningful tasks to accomplish within their physical limitations. About 30% - 85 year olds show some sign of dementia. Surgical and other medical procedures are associated with increased risk in the elderly; since the elderly's life span is limited, the cost-benefit ratio for expensive procedures is often marginal and form any, it might well not be worth it. There is no denial for the sacredness of human life when an elderly patient elects to live out the natural history of his disease.

aging process a reminder of my own infirmities

Philosophically and theologically, the aging process and death is linked to man's sinfulness. The humanist might cling to the hope that the immortality of man is just a few experiments away, but this is not scientific truth. Understanding the science of aging and accepting our eventual death allows us to plan our lives, to utilize our time most wisely and so glorify our Creator.

**COSMETICS AND COSMOLOGY:
AFRICAN ADORNMENT, CHRISTIANITY AND BIOMEDICAL
TECHNOLOGY**

William B. Hurlbut, MD
Stanford University
Stanford, CA

The use of biomedical technology for purposes beyond the traditional role of healing raises difficult questions about nature, the body, and the place of man as artist of his own creation. *Plastic*

These issues are explored through the relationship between cosmetics (body adornment) and cosmology (world wide) from three contrasting perspectives.

The pervasive connection between medicine, cosmetics and magical and religious practices is discussed and principles are sought to guide the use of our new technology.

Keynote speaker

BIOETHICS: BELIEFS, BATTLES, AND BRAINS

Dr. John F. Kilner
Wilmette, IL

This talk will introduce the controversial field of bioethics. First, the diverse ways people approach bioethical issues will be considered, with special attention to the unique perspectives of the Christian believer. Next, the most important debates in the bioethical arena will be surveyed. Finally, special attention will be paid to newly emerging ethical issues in this official "Decade of the Brain."

**LIFE ON THE LINE:
FAITH AND PHYSICIAN-ASSISTED SUICIDE**

Dr. John F. Kilner
Wilmette, IL

This talk will give careful consideration to a topic as old as health care and as new as today's newspaper: physician-assisted suicide. This vexing question will be explored from three vantage points: the practice of health care itself, the needs of patients, and the insights of Christian faith. Links to broader questions of foregoing treatment and euthanasia will be noted.

**WHEN THE INEVITABLE IS INTOLERABLE:
RATIONING, REFORM AND THE ROLE OF CHRISTIANS**

Dr. John F. Kilner
Wilmette, IL

Both the current health care "system" and various reforms designed to cure what ails it have been vehemently criticized on grounds that they ration care. In this talk, the slippery notion of rationing will be defined,

its present and future place in health care examined, and popular attitudes toward it investigated. The conclusions reached suggest a particular strategy for Christian involvement in the present debate.

THE HERMENEUTICAL DILEMMA -- CAN WE READ NATURE?

Larry Martin - *Physicist Galileo*
 Chicago, IL *The Book of Nature.*

Much has been written by scientists about, "reading the mind of God" or "seeing the face of God" in or through the scientific study of nature. Much has also been agreed upon by Christian scholars concerning the proper method of interpretation of Biblical texts. This art of hermeneutics is taught regularly in seminaries to all pastors. However, I have never heard of any science department course which claims to train students in the art of drawing out the meaning of the physical world. Though theologians teach a method, generally called the hermeneutical circle or spiral, the scientific method seems more of a hermeneutical tangle. Thus I am led to ask, is a hermeneutic of nature even possible? *Are extinctions, damnation?*

Just as hermeneutics is not taught by the Bible but is necessary to understand its teaching, nature does not tell us how to do science but some scientific methods is necessary to understand nature. However, these two uses of the word "understanding" are quite different in their respective contexts. It is this confusion which leads some scientists astray into pontification on traditionally religious matters.

Where may we legitimately "read" God's will, designs or purposes from the "book of Nature?" Though God is traditionally called the author of all things, pushing this analogy too far may lead us to infer that we may receive revelation from sources where God is either silent or not speaking to us. *Functional vs. teleological purpose.*

After careful demonstration of a few key principles of the hermeneutical arts as applied to passages often thought to indicate that God speaks through nature, I will show the paucity of such techniques in the scientific enterprise.

Nature isn't a text - neither message nor nonsense. has no context (perhaps poets do).

Scripture = Christ's story - Why. Nature = how.
 Ps 111 } *What? Why?*
 Ps 119 } *Power*
 Divine nature (not as God) } *glorify obey*
 14 *But can be amazed & respectful*
Ea. responds his own way.

THE MOSS SCOPELOPHILA AND HEAVY METAL CONTAMINATION: ANALYSIS OF GENETIC VARIATION

Marv Meyer and A. Jon Shaw
 Eastern College
 St. Davids, PA

Scopelophila cataractae, one of the so-called copper mosses, was the only organism found growing at a heavy metal contaminated site in eastern Pennsylvania. As a first step in investigating its survival under these adverse conditions, we examined the genetic variation of the population. Only the gametophyte stage was found, therefore reproduction was strictly asexual. This would imply low variability, so we identified RAPD markers, which identify DNA sequence polymorphisms. Differences within the population were demonstrated. The North American distribution of this moss is only in heavy metal contaminated areas or in areas with high natural copper levels. Morphological features and isoenzyme markers are surprisingly constant between these populations. The RAPD technique revealed patterns of between population variability which may reflect biogeographic history.

THE ETHICS OF PUBLIC HEALTH RESEARCH: A CASE STUDY OF EMF

Ruth Douglas Miller
 Kansas State University, Manhattan, KS

Control of health care costs requires control of research spending as well as some means of controlling costs of patient care. Research on environmental factors possibly weakly related to diseases such as cancer may be driven as much by publicity as public health considerations. Examples include environmental radon, dioxin, and PCB's, as well as power-frequency electric and magnetic fields (EMFs).

Evidence for the carcinogenicity of EMFs, though present, is quite weak. It is based almost entirely on epidemiology, which has been lacking in a consistent and reliable means of determining actual exposure. Minor effects seen in laboratory animals or cells in culture are not clearly linked to illness. Finally, there is no known physical mechanism to produce any health effects from the low-frequency, low-intensity EMFs emitted

Sci = the creaturely stewardship of the technical possibilities of creation.
→ God's will, design, purpose
what it means is "meant" - much on sci is here (reading into scrip = bad).

by power lines, house wiring and appliances. Dollars are spent chasing an unlikely cause of rare cancer, driven by public fear and dislike of a technological eyesore, galvanized by reporters more interested in readership than accuracy.

What is the role of the Christian researcher in such a situation? Many research projects are esoteric and without immediate practical significance. Yet at times excessive attention is focussed on areas of minimal risk to public health, while truly critical issues may be ignored because the scientific community cannot state its conclusions or predictions with absolute certainty. Scientists must communicate the significance of their results in a way understandable to the non-scientist, and Christians in the sciences must be above reproach in their work, the pursuit of funds, and reporting of results.

A THEORY OF THEISTIC EVOLUTION

Gordon C. Mills
University of Texas - Medical Branch
Galveston, Texas

The author presents a theory of theistic evolution as an alternative to current theistic and naturalistic theories. He insists that the origins of new genetic information is the major unanswered question of a fully naturalistic theory. He notes that most current theistic theories of evolution are dependent upon the following presupposition: that "molecules and organisms have in fact accomplished the changes in the macroevolutionary paradigm simply by employing their own resident capacities" (Van Till). The author believes that the properties of molecules and organisms noted experimentally do not support this presupposition. He then proposes the following as a theory of theistic evolution: that in the history of the origin and development of living organisms, at various levels of organization, there has been a continuing provision of new genetic information by an intelligent cause. For a theist, that intelligent cause is God. The author provides three postulates, that further define the theory, and he considers in some detail what he means by new genetic information. He affirms that traditional statement of Christian theism that God is the Author, Sustainer and Finisher of all natural processes. His theory of theistic evolution is considered in regard to (a) a "God of the gaps" theology, (b) hypotheses of common ancestry and

punctured equilibrium, (c) the role of natural selection, and (d) the direction of current research in molecular evolution.

SCIENCE IN THE PRE-CLASSICAL WORLD (3500 B.C. - 500 B.C.)

Mary Jane Mills
Galveston, Texas

What the ancients accomplished is referred to by some as science, but more often it is not accepted as science by modern historians. Saggs notes that though they certainly knew some facts which would certainly come under the heading of scientific knowledge, "they lacked the organization of their knowledge which would justify the use of the term, science." However, Roux comments: "Sumerian and Assyro-Babylonians alike were blessed with almost all the qualities required of a truly scientific attitude of mind.... They recorded and correlated a vast amount of data, not so much for practical purposes, as for the sake of pure knowledge."

Let us note what the ancient Sumero-Akkadians accomplished. They began to write and keep records. The Sumerians developed a "school" system for teaching their unique cuneiform writing. Ultimately, those who "graduated" took specific jobs. There was the very important position of temple scribe as well as work involving other categories of administrative activities. Many of the latter would later become important government officials.

The Sumerians recorded long lists of trees and birds; also, a variety of animals including insects and birds. They listed countries, cities, villages, and stones and minerals. Many of these lists were taught in their schools. What additional uses they made of these lists is somewhat uncertain. Most importantly, the Sumerians excelled in mathematics and astronomy. We are indebted to them even today in our clocks and calendars, both of which are based on the use of the base six in mathematics. Were these ancients scientists? Whether your answer is yes or no, we still need to acknowledge how much we owe to them.

What regard to another species for our own good? Few good ethical models for this. Since 60s the civ. has also self-expression, personal was perceived in 60s reinforced by them later.

ANIMAL RIGHTS AND THE BIBLE

William Brink Monsma
The MacLaurin Institute
Minneapolis, MN

The question of animal rights cannot be ignored in bioethics today. Concerned about reported abuse of animals in labs, activists have used a civil-rights model to insist on the equality of animals with humans. On this view, we have no right to use animals in experiments developing treatments for humans. This is a reaction to a materialistic view of animals as merely a resource to exploit.

Message of = value? Small pot. virus? Use humans instead of animals for research? Do animals protect our habitat?

What does the Bible have to say about our relationship to animals? From Genesis, Leviticus, Psalms, the Gospels, and Revelation, we see that animals are like humans in being part of God's good creation and in sharing God's blessing. They are called on to join us in praising God. Their life, embodied in their blood, belongs to God, and we may not take it. But there are differences between humans and animals. We are stewards of the earth, they are not. We have a responsibility to care for them, not they are us. Under certain circumstances, we may make use of their labor, their milk, and even their skin and meat.

Gen 1: 24-30; 2: 19-20; 3: 1, 21; 6: 19-21; 9: 3-4, 8-11; Exo 20: 8-11, Lev. 17: 10-14; Ps 104: 19-23; 150: 6; Mt 10: 29; Rev 4: 6-7; 5: 13

This implies that animals may be used for food and for research but only within limitation.

Rule over = proper order, like gun. - good life where you belong. Name = recognize + proper place. Rainbow covenant shared w/ animals. We're all called to praise God, each in its place.

THE L-DOPA CONTENT OF TWELVE VARIETIES OF VELVET BEANS

Hasnain Hamayat and Rolf Myhrman
Judson College
Elgin, IL

Velvet beans grow readily in tropical climates around the world. Although they are protein-rich and could have a significant impact on the well-being of undernourished peoples, their use has been restricted because they contain high levels of L-DOPA, which has been widely used in the treatment of Parkinson's disease. Excessive consumption of DOPA by humans results in a variety of neurological disorders. For this reason, the plant has been used primarily as a soil replenisher and for animal fodder.

In a previous report to the ASA, we described the development of a chromatographic assay for DOPA in plant extracts, and demonstrated how it could be applied to the analysis of velvet bean "coffees" which are brewed in Central American countries. We also described a simple technique for extracting DOPA from powered velvet beans.

At the request of CIMMYT (The International Maize and Wheat Improvement Center) in Mexico City, we have done a comparative study of the DOPA content of twelve varieties of velvet beans from West Africa and the Western Hemisphere. This required that we first develop a method for determining the total amount of DOPA in plant material, as opposed to simply measuring the amount which is extracted when one makes a coffee from roasted bean powder. This new extraction method was then applied to each of the twelve varieties.

We find that the DOPA content of different varieties of velvet beans varies considerably, even for samples within the same continent. For example, the "edible" velvet beans from Ghana actually contain more DOPA than several other varieties. Fortunately, people in Ghana are able to use ground velvet beans as a soup thickener on a daily basis because their preparation techniques result in the DOPA being extracted and discarded.

We are currently evaluating the loss of vitamins and proteins which occurs during the extraction of toxins from velvet beans, and hope to be able to recommend optimum preparation procedures to people for whom this plant represents an important source of nutrition.

ETHICS AND THE ROLE OF THE PROPHET

Stanley Rice
Southwest State University
Marshall, MN

A prophet is not a person who simply foretells the future. If this were the case, we would have to conclude that the most famous of all prophets, Jonah, was a failure, for his prophecy did not literally come to pass. Old Testament prophets extrapolated current trends into the future, and proclaimed to the people what would happen to them if they allowed current trends to continue (if they did not repent).

Psalm 12:4
Isa 24 - earth desolate... (then from environment to
root: issues

The role of the prophet goes beyond the writers of Old Testament books. Prophets had a recognized role in the New Testament church. Prophets were found outside the Old and New Testament *ecclesia*, as for instance Balaam. Today, there are many prophets within and outside the recognized church, who make dire predictions about the future consequences of ecological disruptions, biotechnology, and technology in general. It would be as inappropriate to dismiss these prophets, just because their dire predictions did not come to pass on schedule, as it would be to dismiss Jonah. Their role is to point out the need for repentance.

Rachel Carson, silent spring: Predictions failed but prophecy succeeded.

Prophetic visions can be expressed in fictional literature that explores nightmare worlds of super-technology (including biotechnology) or ecological disaster. They are useful to us, for we are alerted to the type of future we wish to avoid.

Two recurring themes in Biblical prophecy are (1) the destruction of the land as a result of sin, and (2) the abuse of power by the rich, which results in oppression of the poor. First, Amos warned that, as a result of sin, "the pastures of the shepherd mourn, and the top of Carmel withers," suggesting ecological disaster for both artificial and wilderness ecosystems. Second, new technologies can be abused by the wealthy and powerful, who could use them to, as Amos said, "buy the poor for silver and the needy for a pair of sandals" and "trample the head of the poor into the dust of the earth."

STEWARDSHIP OF ANIMALS IN RESEARCH: ETHICS AND AN EXAMPLE

Martin M. Root
Cornell University
Ithaca, NY

Animal rights activists seek to prohibit the use of animals in research. Biomedical researchers and ethicists have responded with various ethical justifications. These defenses of animal use have largely failed to meet the animal rightists' challenge because they fail to find an ethically firm foundation to distinguish humans from other animals and to determine that humans are worthy of unique inherent rights. Christians have long cherished the doctrine of the creation of man in God's image as the unique basis of God-given inalienable rights. The Genesis mandate to

humans to rule and steward the earth and its resources also applies to laboratory animals.

How then should Christians respond to this current moral battle? We should live out and publicly articulate a Christian world view. Christians also need to exercise good science. The intellectual rigor of the scientific process is parallel to the ethical rigor of proper animal use in research.

Using a recent carcinogenesis animal study, I have had the opportunity to apply the stewardship principles of "replace, reduce, refine" to an animal model. In this case, replacement of the animal study by non-animal alternatives was not possible. Efforts were made to reduce the pain experienced by the animals, to maximize the data gained per animal, and to refine the data analysis.

PRIORITIES IN BIBLICAL BIOETHICS

Daryl F. Sas
Geneva College
Beaver Falls, PA

All human activity, including the activity of determining what is ethical in the area of biology and medicine, is inherently and ultimately based upon the world view of the individual performing the activity. If that world view is dualistic, then ethical questions will be framed and "answered" in a dualistic way. A Biblical world view is not dualistic, since all of reality has been created, affected by the fall, and benefits from the redemption made possible in Christ. I have sought to develop an approach to bioethics which intentionally begins with a Biblical world view, rather than beginning by default with a humanistic world view and then accommodating the Bible to it. My conclusion is that when confronted with an ethical problem, false conflicts resulting from dualistic world views must be swept aside and the problem reviewed from the three-part perspective of whether the decision is obedient to Biblical law, whether the decision-maker is properly motivated by Biblical love, and whether the needs of the individuals affected by the decision are being met with Biblical justice. Within each of these three areas priorities have been established which enable the most ethical answer to be identified. Where multiple ethical questions are present,

add

*Freedom will consensus choice control autonomy
nature reason laws programming suffering disease
independent autonomy choice
dependant bondage helplessness
Bib. law, motivation, & needs.
save these aside
Reframe problem in Bibbed w. r.*

the priorities must be weighed with respect to their centrality to the three Biblical principles of obedience, love and justice.

The 3 are integrated

*Old Mic 6:8
Mt 23:23*

Priorities are within biblical law each.

THE HUMAN BRAIN AND THE BIOLOGY OF ETHICS, MORALITY, AND SIN

Timothy J. Shaw
Bethel College
St. Paul, MN

*Morality
Empathy
Religion
Social altruism
Aesthetic beauty
Formalized language*

Functions - unique

An interesting question relating the human brain and ethics asks, "what biological basis, if any, can be established for ethical and moral behavior?" A second, and even more interesting question poses, "What relationship do religion and the concept of sin have to these behaviors?" Among the animals which show complex social behaviors, the brain of humans appears to direct the most thoughtful and sophisticated social interactions. It is the "thinking portion" of the brain, represented by the connections of the large cerebral cortex in humans in deeper and more primitive regions of the brain, that direct and integrate these complex behaviors. The human brain has many portions, however, that are analogous to the brains of lower vertebrate forms. An interesting theory of brain function based on comparative brain anatomy describes a "triune brain" with three separate active components which interact to produce behavior. These components are arranged in a development hierarchy with higher centers able to exert some control over lower components. Certain behaviors essential for survival are linked to more primitive portions, and can be observed in humans as well as in lower forms. In humans, these more primitive behaviors sometimes issue from choice after reflection, but often are those exhibited in the absence of conscious control from higher brain centers. Social behaviors of the more primitive "animal" brain are primarily selfish, and apparent moral or altruistic actions can be linked to kinship relatedness and/or benefit reciprocity. Certain moral or altruistic interactions which occur among humans, however, do not reflect basic instincts for personal or offspring benefit, and cannot be fully described by these sociobiological explanations. The religious phenomenon of "sin" among humans stems from inadequate control of selfish instinct. The theistic call of morality produces behavior which is antithetical to these biologically based explanations, and raises important biological and theological questions about the possible source, survival, and purpose of these behaviors in humans.

*Ed Wilson's priorities: Self, offspring, kin, class, species (sociobiology) - The "altruism" is all selfish.
Mt 16:24 - lose life to find it 22 contrary Martyrs.
In priority: GOD, Others, self*

BROADENING PERSPECTIVES OF COMPLEX BIOETHICS ISSUES

L. Duane Thurman
Oral Roberts University
Tulsa, OK

Before making bioethics decisions, the issue should be examined in its broadest context. Acquiring a broad perspective lessens the chance of investing fruitless effort on symptoms instead of dealing with root causes. A broad perspective also reduces the risk of your "solution" to one aspect of the issue causing or worsening problems elsewhere. The basic steps are:

1. BRAINSTORM for all known components and possible consequences. Involve several others in your brainstorm group, especially those with different backgrounds and viewpoints, to reveal "the rest of the story".
2. LINK components, interactions, and consequences into a concept map of existing and proposed relationships.
3. QUALIFY relationships as much as possible. Some pathways may represent 95% of the cases while others happen rarely.
4. EVALUATE this broader picture on ethical, moral, spiritual, scientific, social, economic or other aspects you consider important.
5. SELECT that part of the issue where your time and talents can be most effectively applied.

I use this approach in class by first analyzing a worked example such as the deer overpopulation problem in the Northeastern U.S. parks. We then apply this technique to a related bioethical situation, human population/hunger, to give experience in concept-mapping an emotional bioethical issue rationally. After brainstorming and setting up the major framework of relationships in class, students finish the concept map as homework. In lab, teams of students finish concept maps of the components. We then discuss each team's version of the concept maps, including reasons for their different arrangements of the same components.

"A PREFACE TO BIOETHICS: FOUNDATIONS FOR A CHRISTIAN APPROACH TO BIOETHICS"

Albert Truesdal
Nazarene Theological Seminary
Kansas City, Missouri

Before engaging in bioethics in a manner that is characteristically Christian, we must first identify and articulate the primary convictions that provide a foundation for a Christian contribution to bioethics. As in all areas of moral discourse, what Christians have to say about bioethics must derive from what they believe about the Christ and his church, and about the divine story of creation and redemption. The Christian virtues through which primary Christian convictions express themselves should be evident in any Christian response to the many moral questions generated by bio-medical technology.

Human life is inviolable, but not automatically ultimate.

Another way of putting it is that a Christian bioethic must be preceded by a Christian metaethic. It must establish theological foundations, state Christian conceptualization of reality, make clear the nature of Christian moral language, and mark the relationship between Christian ethics and other forms of moral discourse. What is there about a Christian basis for bioethics that makes it distinguishable from any other (e.g. a teleological ethic based on enlightened democratic idealism) approach to bioethics?

This paper will draw on the work of Christian ethicists such as Stanley Hauerwas and Phillip Wogaman to develop a set of Christian convictions that provide foundations for a distinctively Christian bioethics. Neither developing nor applying a bioethics is the paper's concern. Some of the convictions to be explored are the meaning of covenant and community, the conferred value of persons, a Christian appraisal of technology, stewardship, and grace and faith.

While the paper seeks to identify what is distinctive in Christian bioethics, it also recognizes that there are important points of convergence between Christian moral discourse and moral discourse built principally upon philosophical foundations.

St. Barth: worship vs. worshiping health.
Individuality is always worked out in relationships.
An outlook on technology - can be used for both good & evil.
Original sin - hence "used for evil". Creativity expressed.
With increased power, comes increased risk.
St. AD: 19? tenet farmers.

IS THE NEO-DARWINIAN MECHANISM OF NATURAL SELECTION ACTING ON RANDOM MUTATIONS ADEQUATE FOR THE CREATION OF NEW MAJOR BIOLOGICAL INNOVATIONS?

This question will be addressed from the perspective of paleontology and biochemistry in a Symposium which will be sponsored by the Committee for Integrity in Science Education.

DARWIN'S CRITERION: IRREDUCIBLE COMPLEXITY

Michael J. Behe

Lehigh University
Bethlehem, PA

In *The Origin of Species* Darwin stated, "If it could be demonstrated that any complex organ existed which could not possibly have been formed by numerous, successive, slight modifications, my theory would absolutely break down". A system which meets Darwin's criterion is one which exhibits *irreducible complexity*. By irreducible complexity is meant a single system which is composed of several interacting parts that contribute to the basic function, and where the removal of any one of the parts causes the system to cease functioning. An irreducibly complex system cannot be produced gradually by slight, successive modifications of a precursor system, since any precursor to an irreducibly complex system is nonfunctional.

A mechanical example of an irreducibly complex system is the humble mousetrap, which needs a number of parts, such as a spring, catch, holding bar, etc., to function. If any of the parts are removed, then the trap does not function. Modern biochemistry has shown that many biochemical systems, like the mousetrap, are irreducibly complex, and therefore could not have been produced by natural selection. This talk will discuss several of those systems.

COMPLEXITY -- YES! IRREDUCIBLE--MAYBE!
UNEXPLAINABLE--NO!
A CREATIONIST CRITIQUE OF THE IRREDUCIBLE
COMPLEXITY ARGUMENT FOR INTELLIGENT DESIGN

Terry M. Gray
Calvin College
Grand Rapids, Michigan

Irreducible complexity has long been used by creationists as an argument against evolution. The classic example is the origin of the eye. It is hard to imagine how natural selection could have produced in stepwise fashion such a complex system with so many interworking parts; therefore such systems as explained by appeal to "intelligent design".

The irreducible complexity argument has recently been advanced again in the context of various systems that are observed at the cellular and molecular level in organisms. Protein structure, cilia and flagella, and protein targeting have been cited as examples of irreducibly complex systems.

I will respond to the irreducible complexity argument in four ways 1) The entire universe, as a product of God's creative and governing hand, is designed, even when we can account for its various features with scientific explanations. 2) Hemoglobin, the oxygen transporting protein of the blood, is a complex molecular machine. Although hemoglobin is a fairly simple system compared to a cilium, I believe that comparative studies of hemoglobin at the protein and gene level have suggested to us how such molecular machines might come about. 3) The relatively new science of complexity theory *may* provide a non-Darwinian solution to this problem. A property of complex systems far from thermodynamic equilibrium is that order and new properties arise spontaneously. 4) Premature appeal to special divine activity to explain the world around us damages the Christian theistic apologetic.

TAXONOMY, TRANSITIONAL FORMS AND THE FOSSIL
RECORD

Keith B. Miller
Kansas State University
Manhattan, KS

The recognition and interpretation of patterns in the fossil record requires an awareness of the limitations of that record. Only a very small fraction of the species that have lived during past geologic history are preserved in the rock record. Most marine species are soft-bodied, or have thin organic cuticles, and are essentially unpreservable except under the most extraordinary conditions. Furthermore, the destructive processes active in most marine environments prevent the preservation of even shelled organisms under normal conditions. Preservational opportunities are even more limited in the terrestrial environment. Most fossil vertebrate species are represented by no more than a few fragmentary remains. Because of the preservational biases of the fossil record, paleontologists must reconstruct evolutionary relationships from isolated branches of an originally very bushy tree.

The process of describing and classifying organisms introduces its own patterns into the taxonomic hierarchy. Firstly, because organisms must be placed in one group or another, taxonomy gives the impression of discontinuity. Secondly, the placement of species into higher taxa is done retrospectively; that is, by looking backward through time. The evolutionary significance of particular morphologic transitions is only recognized because of the subsequent success of particular lineages. The defining characters of higher taxa are thus a consequence of history, and do not represent some objective scale of the magnitude of morphologic divergence.

Because new character states are added over geologic time, the morphology of species within a higher taxonomic group become less divergent toward the point of origin of that group. In addition, species appearing early in history of a taxon approach more closely the morphology of species from other closely related higher taxa, often to the extent that their taxonomic assignment is uncertain. Transitional forms between higher taxa are thus a common feature of the fossil record, although continuous fossil lineages are rarely if ever preserved. Evidence from the fossil record is consistent with a wide range of proposed evolutionary mechanisms.

TESTING THE PREDICTIONS OF THE NEO-DARWINIAN
MECHANISM AGAINST MACRO-PATTERN IN THE FOSSIL
RECORD: VERIFICATION OR FALSIFICATION?

John Wiester
Buellton, CA

Recent failed tests of orthodox "evolution stories" such as butterfly Batesian mimicry and the coevolution of insects and flowers indicate the wisdom of testing the predicted pattern of the Darwinian mechanism against the macro-pattern of the appearance of the animal phyla in the fossil record. This pattern in the fossil record has recently come into sharper focus, due to research and publication utilizing the punctuated equilibrium framework; the recognition of the role of mass extinctions in shaping the pattern; and more recently, the redating of the Cambrian Explosion (the "Big Bang of Animal Evolution") to 25% of its former value. This paper will test the following predictions of the neo-Darwinian mechanism: numerous transitional forms will link the phyla to their common ancestors; morphological distance will increase over time (diversity will precede disparity); and the number of phyla will increase over time. The actual pattern in the fossil record demonstrates that, while the mechanism may account for diversity, it is at best inadequate, and perhaps even falsified, as the explanation for the appearance of complexity in the fossil record. It is time to search for supplemental or new mechanisms to account for the major themes in the history of life.

James Peterson - Case Study Report (synopsis)
(Wingate Col., Charlotte NC - Ethics; etc)

Need to be God-centered in our ethic - but how does this work in practice? Different views help -

Dominant concerns: Who decides med. ethics? confusion re "autonomy": until 1960s MDs didn't tell pts. cancer is terminal; cruel + loss of hope for recovery. Now few don't tell; don't know specialists well & ethical comms is diverse, can't assume common values. A: self-law, make your own law; or make space to protect the values of self to the rest comms. Informed consent - can't give all relevant info but can all they need to know to make a fitting choice. Also so can understand the consent, competency, Proly decision making; Liv. Wills can raise questions but can't meet all options as HC Power of Attorney is better. Consensus via Hosp. Ethics Com. to help develop it. Courts as last resort.

① Love God & enjoy Him forever. Purpose of life = love God & enjoy Him forever. Medicine not ultimate purpose, Hoop of never-sails (love life = lose it). Death = transition to next life & is defeated. Like birth = a framework. Stewards of gift of life. ② Love neighbor = more on responsibility than rights in NT sky. Partitioning - rough forks, shelter, health care. We do "now via ability to pay." ③ Choices affect others = slippery slope, camel's nose in tent. Acceptable initially maybe not so when advanced (camel). Momentum to choice. Logical difference betw step 1 & 2?

④ Care: Ordinary/extraord. HCare: low cost, the benefit -> chronic-terminal (prolong dying). Futility - no agreement on it. Care/Cure - No union, but much harmony in discussions - agreement & share comes together in insight.

Public v private. Push nurses - as those of the pt. Surrogate judgments - no interests. Ranger of institutionalizing - rigidly. socialized med. profit-nonprofit preventive care & health maintenance. Money influencing TV.