

43rd Annual Meeting of the ASA  
August 5-8, 1988  
Pepperdine University  
Malibu, California

**"Science, Weapons, and Hope:  
Christian Perspectives"**

**FRIDAY, AUGUST 5**

4:00-6:00 PM Registration (Smothers Theatre)  
5:00-6:30 PM Dinner (Tyler Dining Hall)  
7:30-9:00 PM **PLENARY SESSION** (Elkins Auditorium)  
**Richard Bube**—"Crisis of Conscience for Christians in Science"  
9:00-11:00 PM **Mixer** (Galley)

**SATURDAY, AUGUST 6**

7:00-8:15 AM **Continental Breakfast** (Galley)  
8:30-9:15 AM **Devotions** (Stauffer Chapel)  
9:15-10:00 AM **SESSION I**  
**Bate**—"The Christian as Peacemaker in the Violence of American Politics" (Elkins)  
**Murphy**—"The 'Elements' of Galatians 4 and the Nuclear Threat" (Appleby 245)  
**Hartzler**—"Learning to be Peacemakers" (Appleby 205)  
10:15-11:00 AM **SESSION II**  
**Niemeyer & Phinney**—"Is There Hope for One Who Works in a Nuclear Weapons Lab?" (Elkins)  
**Frederickson**—"Genesis 1, and Cosmic Background Radiation" (Appleby 205)  
**Arveson**—"40 Years of the ASA's *Journal*" (Appleby 245)  
12:00-1:00 PM **Lunch** (Dining Hall)  
1:15-2:00 PM **SESSION III**  
**Swearengen**—"Comparative Analysis of the Nuclear Weapons Debate" (Elkins)  
**Stewart**—"A Whale Story Too Hard to Swallow" (Appleby 245)  
**SESSION IV**  
2:15-3:00 PM **Siemens**—"In Defense of Nuclear War" (Elkins)

3:00-3:45 PM

3:45-4:00 PM  
4:00-4:45 PM

5:00-6:00 PM  
7:00-8:15 PM  
8:15-9:45 PM

9:45-11:00 PM

7:00-8:15 AM  
8:30-9:30 AM  
11:30-1:00 PM  
1:00-4:30 PM

4:30-6:00 PM  
6:15-7:00 PM

7:15-8:45 PM

**Northup**—"The Possibility of a Safer & More Humane World" (Appleby 205)

**Hanger**—"The Publishing Process" (Appleby 245)

**SESSION V**

**Lindquist**—"Conflict Resolution in the Church" (Appleby 205)

**Monsma**—"Ideology and War" (Elkins)

**McDonald**—"Beginning Steps for Elaboration of Hierarchy Theory" (Appleby 245)

**Break & Refreshments**

**SESSION VI**

**Arveson**—"Dialog as a Means of Conflict Resolution" (Elkins)

**Munday**—"Biblical Principles of War" (Appleby 205)

**Hoshiko**—"Animal Rights and the Denigration of Man" (Appleby 245)

**Annual Business Meeting** (Elkins)

**Banquet** (Dining Hall)

**PLENARY SESSION** (Dining Hall)  
**Daniel Caldwell**—"Ethical Dilemmas of Strategic Deterrence & Arms Control"

**Mixer** (Galley)

**SUNDAY, AUGUST 7**

**Continental Breakfast** (Galley)

**Worship** (Stauffer Chapel)

**Lunch**

**Free time**

Tours of J. Paul Getty Museum & Page (La Brea Tarpits) Museum (12:30-2:00 & 2:30-4:00 for Page)

**Dinner** (Dining Hall)

**SESSION VII**

**Jappe**—"Freeman Dyson's *Weapons and Hope*" (Appleby 205)

**Bullock**—"The Final Epidemic: Nuclear War, AIDS, or 'X'?" (Elkins)

**Hazen**—"The Scientific Study of Religion and Christian Apologetics" (Appleby 245)

**PLENARY SESSION** (Elkins)

**Bryan Hehir**—"Deterrence: Its Status & Future"

9:00

PM

**DISCUSSION GROUPS** (Appleby)

**Brubaker**—"Bombs or Bread: Peacemaking through Agriculture"

**McDonald**—"Conflict & Peacemaking in Congregations"

**Lindquist**—"Conflict Resolution Among Individuals Within or Outside the Church"

**Gruenwald**—"Soviet Peace Campaigns: Threat or Promise?"

**Bullock**—"Suggestions for Improving the *ASA Journal*"

**Olson**—"The ASA Science Education Project"

**Falk & Camp**—"Biology Curricula in Christian Colleges"

**Murphy**—"The Anthropoc Principle"

**MONDAY, AUGUST 8**

7:00-8:30

AM

**Continental Breakfast** (Galley)

8:30-9:15

AM

**Devotions** (Stauffer Chapel)

9:15-10:00

AM

**SESSION VIII**

**Rice**—"Nuclear Winter" (Elkins)

**Neuhouser**—"Postulates, Paradoxes, and Pacifism" (Appleby 205)

**Neidhardt**—"The Functional Dependency of Reason on Faith in Theological Science" (Appleby 245)

10:00-10:30

AM

**Break & Refreshments**

10:30-12:00

PM

**PLENARY SESSION** (Elkins)

**Panel:** Caldwell, Hehir, Swearengen, Kirkemo—Stanley Moore, Moderator.

12:15-1:15

PM

**Lunch** (Dining Hall)

1:30-2:15

PM

**SESSION IX**

**Moon & Yang**—"Two Faces of Science in Christian Perspectives" (Elkins)

**Moberg**—"Religious Hypocrisy" (Appleby 245)

**Haas**—"Arthur Peacocke's *God & the New Biology*" (Appleby 205)

Program continued

2:30-3:30 PM **DISCIPLINE WORKSHOPS**  
 (Appleby)  
**Physics** (George Bate, chair)  
**Geology** (David Young, chair)  
**Biology** (Russ Camp, chair)  
**Political Science** (Stan Moore, chair)

3:30-4:00 PM **Break & Refreshments**

4:00 PM **WORKSHOPS** continue

ASA extends thanks to Program Chair, Stanley Moore, and to all those who have lent their support to this year's Annual Meeting.

On Tuesday, August 9 there will be two post-meeting tours to the following locations:

- *Caltech Seismological Laboratory and San Andreas Fault Area*
- *Jet Propulsion Laboratory in Pasadena and Huntington Library & Art Gallery in San Marino*

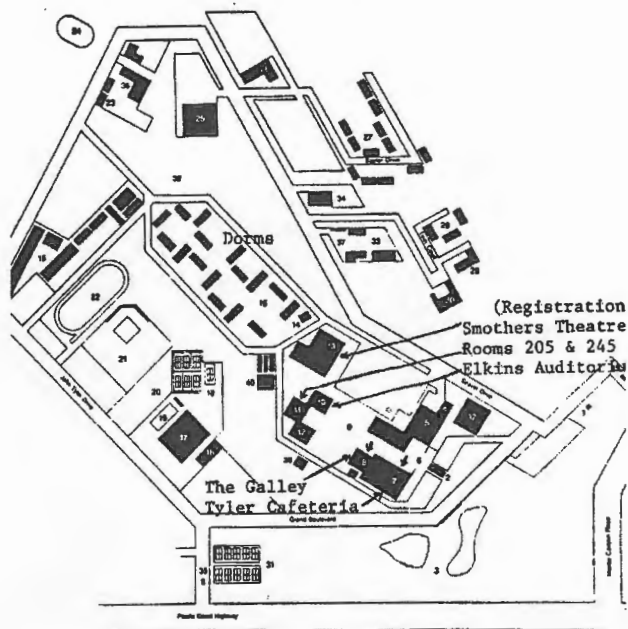
Those interested please remember to register to stay an extra night or nights and note your tour interest as you check in.

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  
 PO Box 668  
 Ipswich, MA 01938



PEPPERDINE—Malibu Campus map



Some key sites for ASA 1988 Annual Meeting:

2. Stauffer Chapel
7. Tyler Campus Center
8. The Galley
9. Adamson Plaza/Joslyn Plaza/Scaife Terrace and Bridge
10. George Elkins Auditorium
11. Appleby American Studies Center
12. Murchison Science Center
13. Ahmanson Fine Arts Center/ The Founder's Building/Smothers Theatre/Music Building
15. Seaver College Housing
17. Firestone Fieldhouse
18. Ralphs-Straus Tennis Pavilion
19. Raleigh Runnels Memorial Pool
20. Intramural Field
24. Equestrian Center
31. Crest Tennis Courts
35. Information Booth
38. Recreational Area

**PREVIEW COPY**

ABSTRACTS OF THE 43RD ANNUAL MEETING OF  
THE AMERICAN SCIENTIFIC AFFILIATION  
August 5-8, 1988  
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Forty Years of the ASA's Journal: An Analysis  
Paul T. Arveson  
Silver Spring, MD

During the past two years I have engaged in the production of a subject index to the Journal of the American Scientific Affiliation. In the course of this work I have tried to get a sense of the historical trends reflected in the Journal. This review describes some new statistical findings on interests of Journal authors, and how they interacted with cultural and theological issues of the day. Several major phases of interests are apparent. Also the review analyses how ASA authors dealt with major issues over the past 40 years. Finally, I selected a set of "classic" articles that are still worth reading. The ASA Journal is a unique resource, and it is my hope that we will not re-invent wheels but consult the back issues for those that have not gone flat after all these years.

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The Christian as Peacemaker in the Violence of American Politics  
George L. Bate  
Westmont College, Santa Barbara, CA

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The Final Epidemic: Nuclear War, AIDS, or X?  
Wilbur L. Bullock  
University of New Hampshire

War, famine, and pestilence are three calamities that have been inter-related in Scripture and in history. Frequently, one leads to the other or exacerbates the effects of the other. In *The Final Epidemic* (Ruth Adams and Susan Cullen, editors, 1981) the several authors discuss nuclear war by an analogy to epidemics/pestilence; Herbert Abrams (Chapter 15) more specifically discusses the possible infectious disease complications of this hypothetical "final epidemic".

Even apart from nuclear war, we have been reminded during the current decade that we still have war and famine and pestilence. The current serious and intensifying epidemic of AIDS has been portrayed by some sensationalist writers as another pandemic that, like the "black death" of the fourteenth century, threatens to wipe out much of the human race. Others view it as God's judgment on homosexuality and drug use. Frightening though the possibilities of AIDS are it is unlikely that AIDS, with or without nuclear war, is going to destroy mankind.

In the past, however, smallpox, bubonic plague, cholera, influenza, and other diseases have been major catastrophes in many parts of the world. These and possibly other diseases could strike again, with or without war or famine, but especially in the event of even a limited nuclear war were to affect the health care delivery systems we have come to take for granted. Certainly AIDS, even when we discount the alarmist prognoses, has already warned us of the short-comings of our public health and our health-care systems. We as Christians need to be aware of the serious problems of balancing research, education, health-care delivery, and individual rights to privacy when serious epidemics threaten.

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Genesis 1, and Cosmic Background Radiation  
John Frederickson, Rolling Hills, CA

"If the Author of Nature and Scripture are the same God, then the two books of God must eventually recite the same story." Genesis 1:16 records the making of the two great lights. However, before the making of the sun, Genesis 1:11 records the sprouting of vegetation, presumably in the presence of light. There is some speculation that the sun was already in existence--but hidden by cloud cover--to furnish necessary light to cause sprouting. This paper presents an alternate suggestion for existence of light to cause sprouting of vegetation. The recent discovery of cosmic background radiation may be a vestige of past radiation suitable for photosynthesis.

1. Bernard Ramm

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Soviet Peace Campaigns: Threat or Promise?  
Oskar Gruenwald, Institute for Interdisciplinary Research  
Santa Monica, CA

The purpose of this discussion group would be to explore the nature of Soviet peace campaigns, based on the prior screening of the film, "Agents of Deception." Distributed by the Committee for the Free World, this 50-minute film ties together the global activities of the Kremlin's International Department - the chief instrument of Soviet disinformation. The panel would discuss the desirability of a proper Christian response to the Soviet use of front groups in West European and U.S. peace and disarmament movements, as well as the persecution of dissidents and independent peace groups in the USSR.

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Arthur Peacocke's 'God and the New Biology'  
John W. Haas, Jr., Gordon College, Wenham, MA

Arthur Peacocke, biochemist-priest and Director of the Ian Ramsey Centre, St. Cross College, Oxford is prominent among those who seek to integrate the latest developments in science with a 'liberal theology'. An active promoter of seminars and conferences on science and theology, Peacocke heads an organization charged with the study of ethical problems arising from scientific and medical research and practice. 'God and the New Biology' draws together themes which he has developed over the last two decades.

This sketch of Peacocke's thought will trace his scientific and theological lineage and examine major aspects of his 'critical realistic perspective' on science, religion and their interrelation.

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The Publishing Process  
Nancy C. Hanger, Managing Editor  
American Scientific Affiliation, Ipswich, MA

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**Learning to be Peacemakers**  
H. Harold Hartzler, Goshen, IN

We do well to follow the teachings of Jesus. In Matthew 5:44 he said, "Love your enemies, bless them that curse you, do good to them that hate you, and pray for them which despitefully use you and persecute you."

The peacemaker believes in the power of love. This finds its roots in God's Spirit, and reaches beyond self, family, clan and nation to friend and foe alike. A peacemaker does not give up when he is abused since his strategy is never to return evil for evil.

There are a number of practical things that we can do in the cause of peacemaking. As a member of the Mennonite Church I support the work of the Mennonite Central Committee, the Brethren Service Committee and the Friends Service Committee. Ever since World War I these organizations have been working in many countries in an effort to relieve suffering caused by warfare and strife.

As peacemakers in this country we should use our influence in an attempt to reduce the huge amount we are spending in all branches of the military. Instead of spending hundreds of billions on the military why not spend a fraction of that amount in an effort to bring peace to the world?

All of us are invited to submit proposals to the United States Institute of Peace to undertake research in the area of peacemaking. Congress has appropriated an annual budget for this purpose. You might write to the National Peace Institute Foundation, 110 Maryland Avenue, Washington, D.C. 20002.

Most important is the advice that we should continually pray for peace.

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**Animal Rights and the Denigration of Man**  
Tomuo Hoshiko, Case Western Reserve University  
Cleveland, OH

The use of animals in biomedical research has come under attack in recent years, not only by the antivivisectionist movement but also by academic philosophers. The immense advances in medical and biological science has muted the criticism somewhat but the core assumptions of the academicians appear to have remained untouched. The basic assumption is that animals have rights. This concept is closely argued in an essay by Feinberg (Rights, Justice and the Bounds of Liberty, Princeton Univ. Press, 1980, pp. 159-184) by extension from the idea that humans have rights. Animals are said to have rights because they have interests. Moreover it is argued that these interests arise because animals have desires and aims. Trees, rocks, vegetables, and the dead fail this last test and do not have rights. Provisions in wills are contracts, not rights. Human vegetables perhaps may reasonably be said to have an interest in their survival but not if they are absolutely incurable. No awareness means no expectation, belief, desire, aim or purpose. Without desire, there can be no interest. No interest means no benefit and therefore no rights. The same syllogism is applied to fetuses and to future generations. Feinberg concludes that if the present generation despoils the world or deliberately fails to reproduce, so much the worse for our species - we would have simply proven ourselves unfit for survival. Future generations have no rights. The present generation of philosophic thinkers will legislate for all eternity. The conclusion is absurd and demonstrated the absurdity of the theory and its basic premise. Feinberg has become the victim of his own nihilistic religious presuppositions.

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**Weapons and Hope:**  
A Christian Perspective on Freeman Dyson's Book  
Fred Jappe, La Mesa, CA

Freeman Dyson in his book Weapons and Hope, although not a Christian, has much to say to the military about war and peace and to the Christian about proclaiming the gospel. He argues that we live in a divided world and that both sides lack a language of communication. He gives historic reasons for this and suggests ways of establishing communication. It is clear that these solutions are also useful for proclaiming the gospel across cultural lines.

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**Conflict Resolution in the Church:**  
Theory, Practice, and Case Studies  
Stan Lindquist, California State University,  
and Link Care Foundation, Fresno

**INTRODUCTION:** Conflicts within the Church are common and require special skills to diffuse. The following discussion will provide a basis for discussion and potential healing procedures to provide peace.

Research indicates that there are often five stages of conflict, and that solutions or possibilities for further direction are possible at each stage, with the hope that the hurts can be healed at that point without going further. Anyone desiring to intervene must be distant from the conflict to be useful as a peace maker.

Five stages are: I. Tensions stage, wherein there is a loss of freedom or relationship, without the openness to discuss or heal the disagreements. II. Stage of role dilemma: involving questions about who is responsible for what, and uncertainty about the real cause of the problem. III. Injustice collecting stage: This is the potentially dangerous level, as there is a tendency to save all the negative aspects and disregard the positive sides to any problem. IV. Confrontation: at this point there are accusations, attacks, negative comparisons and the overwhelming desire to win out regardless. V. Adjustments: this requires some openness and willingness to do something about the resolution.

**CASE STUDIES:** Three case studies of examples of conflict and resolution within anonymous churches will be presented.

**INDIVIDUAL PREPARATION:** If a person desires to intervene, some techniques will be reviewed, the use of which increases the possibility of some degree of resolution of the conflict.

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**Beginning Steps for Elaboration of Hierarchy Theory**  
Marvin McDonald  
The King's College, Edmonton, Alberta, Canada

Many discussions on the relations between science and religion over the past 20 years have relied heavily on notions of "levels of explanation" and related ideas. Both popular presentations and more technical work have presented some hierarchy of levels which describes the structure of our world, usually as a means of accounting for the variety of scientific disciplines. The heuristic value of these notions has been quite high, but there remain important questions which have not been addressed.

Any attempt to elaborate hierarchy theory can benefit from considering how hierarchy theory has been discussed in literatures of philosophy of science, general systems theory, scientific methodology and metatheory, as well as the usual textbook discussions on the foundations of science.

This paper also suggests that several purposes can be served by a more detailed examination and extension of hierarchy theory. First, questions regarding general validity of current strategies for science-faith integration can be examined given the pivotal role hierarchies play in available models. Bube and MacKay are examples considered. Second, questions about the range of validity for hierarchy-based models of integration can be explored. For example, should there be substantive differences between integrative strategies in the physical, biological, and social sciences? Third, elaborations of hierarchy theory yield important considerations for strengthening the application of integration models to important issues of our day. An example is presented by exploring approaches to facing conflict and peacemaking in congregations.

In short, this paper joins a recent stream of attempts to clarify key ideas for models of science-faith integration like complementarity and reflexivity.

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Religious Hypocrisy: A Bone of Contention in the Christian Family,  
or Conflict in Christendom  
David O. Moberg, Marquette University

Hypocrisy in the church is not only the "classic heretic's excuse" for staying out of it but also a source of conflict within and among Christian groups. Defined as a species of lying by which one pretends to be holy or virtuous but lives differently, it is widespread and as old as human history. Charges of hypocrisy are made against other groups, not one's own. Selective indignation tolerates many sins of oneself while condemning those of others. Social concern is a major domain within which Christians on opposite sides of current issues charge the other of being hypocritical, or at least misguided. The resolution for the problem is found in biblically based attitudes and behavior. The social and behavioral sciences provide many opportunities for enlightening and helping Christians on this subject.

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Ideology and War  
William B. Monsma, The MacLaurin Institute  
Minneapolis, MN

The ideologies of both capitalism and communism tend toward war. Capitalist individualism sees competition as the basic human relationship, not cooperation; this is extended from economic to military relations. Marxism views a cooperative society as the ideal, but holds that violent struggle against the capitalists is necessary to achieve this. Both ideologies have taken inspiration from Darwin's concept of the survival of the fittest. Christian conceptions of creation and social relationships provide a basis for both peace and freedom.

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Biblical Principles of War  
John C. Munday, Jr., CBN University, Virginia Beach, VA

God, in his omniscience and perfect judgment, permits and directs activities of nations with respect to war and peace. As the Sovereign, God is ultimately in control of all war.

This theological perspective on war provides the framework for investigating many difficult questions about war. Some are as old as war itself. Others concern God's role in war after Christ, as compared to before Christ. The advent of nuclear weapons has raised new issues.

Scripture remains the source of God's truth for resolving issues about war, even nuclear issues. Even as nuclear weapons provoke much rethinking about war, including a re-analysis of just war principles, there needs to be a return to a more basic level, that of God's perspective on war and peace. This paper is an examination of Biblical principles of war.

Summarized, the principles are: God hates and judges sin, God has a purpose for nations, God is the judge of nations, God uses nations as instruments of His judgment, God is sovereign, God is exalted in judgment, God is ultimately the author of calamity, God commands war, God determines the victor in war, God has prescribed rules for war, God imposes bans in war, God helps the righteous in time of war, God shows both mercy and judgment in war, God's wrath is still on ungodly nations.

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The "Elements" of Galatians 4 and the Nuclear Threat  
George L. Murphy  
St. Mark Lutheran Church, Tallmadge, OH

The application of modern science and technology to warfare in recent centuries has produced a new threat to humanity and the world, the threat of technological war. The details of modern weapons systems were not explicitly foreseen by the writers of Scripture, but there are biblical themes which help us to understand the nature of the threat, God's response, and our calling. In particular, the ways in which the Bible speaks of the powers of evil in terms of demons, "principalities and powers", and "the elements of the universe" will be found helpful.

The focus here is on the "elements" of Galatians 4. This term encompasses a complex of meanings, among which four may be distinguished.

- 1) Elementary forms of legal religion.
- 2) Physical elements.
- 3) Elemental spirits.
- 4) Celestial bodies.

Such a complex of meanings must also be dealt with in confronting problems of technological war, and nuclear war in particular. One of our concerns will be the idea of "demythologizing" as a way of bringing current concerns into contact with Scripture.

Major foci will be:

- 1) Introduction.
- 2) The elements and God's creation.
- 3) The elements and sin.
- 4) The elements as a picture of the nuclear threat.
- 5) The working out of Christ's victory over the powers of evil.

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The Functional Dependence of Reason on Faith in Theology and Science:  
An Epistemological Symmetry

W. Jim Neidhardt

New Jersey Institute of Technology, Newark, NY

Theology and natural science ask very different questions and use different procedures to explore the common Universe they share. Nevertheless, at the epistemological level, a symmetry exists between theology and science as both are grounded in "faith seeking understanding" as the theologian Karl Barth and the scientist-philosopher Michael Polanyi have independently pointed out. This epistemological symmetry between the two disciplines is clearly seen in the functional dependence of reason on faith, the structural details of which are suggested and discussed in this paper.

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Postulates, Paradoxes, and Pacifism

David L. Neuhouser

Taylor University, Upland, IN

In every area, the postulates one assumes determine the conclusions obtained. Euclidean postulates imply that every triangle has exactly 180°. However, if one accepts Lobachevskian postulates, then it can be proved that every triangle has less than 180°. If a flat view of the Bible (i.e., Old and New Testament are alike in their revelation of God) is assumed, then a just war position may be applied. However, the thesis of this paper is that if it is assumed that Christ is the highest revelation of the nature of God and all parts of the Bible are interpreted in that light, then pacifism is the result.

The heart of Christianity is love. Therefore, whatever position a Christian takes, just war theory, pacifism, or any other theory, it must be based on love. Thus a close look at what the Bible says about love is crucial in any study of a Christian view of war. Just as in science, paradoxes occur in every human theory. How these paradoxes are resolved depend upon whether one takes the "flat view" or "Christ is highest view" mentioned earlier.

One's view of grace ("cheap" or otherwise?) and faith (how is it related to obedience?) have a bearing on the problem also. Another question is, what does one assume about the importance of Christian tradition? For example, most Christians for over a thousand years have rejected pacifism. And, how important is the position of the early church on this issue?

If basic assumptions are clarified, then agreement is more likely. Although agreement is certainly not assured, a better understanding of our differences should be achieved.

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Is There Hope for One Who Works in a Nuclear Weapons Lab?

Sidney Niemeyer, Pleasanton, CA & Douglas Phinney

Our starting premise is that we all share a common goal with regard to nuclear weapons, namely, that nuclear war never occurs. The issue, then, is how to fulfill this hope. An attractively simple solution is to eliminate all nuclear weapons from the world, but we argue that even if this were attainable, it represents a point of unstable equilibrium. In the presumed absence of all nuclear weapons, any group that develops and builds nuclear weapons achieves a tremendous advantage, much more

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so than under current conditions. We present a case for reducing the size and number of nuclear weapons in current national arsenals to a level which still supplies a credible deterrent towards aggressors, and concurrently reduces the danger of massive destruction. The accompanying doctrine of deterrence that we favor is one that limits the use of nuclear weapons to counterstrikes against military targets. In further support of this proposal, we discuss the morality of possessing nuclear weapons or using them on a limited basis, the implications of only pretending to use them in specified circumstances, the legitimacy of governmental use of force, and how the proposed position might actually result in fewer deaths in military conflicts. We conclude that continued testing of nuclear weapons can, in principle, provide a positive force towards realizing the proposed nuclear stance. Regarding the conference's theme, we actually do hope that the threat of all-out nuclear war can be reduced, and that the work by those who design and test nuclear weapons could contribute to this hope. But our more secure hope is founded in knowing that the world cannot be destroyed apart from God's will and purposes, and the ultimate issue is our relationship to that sovereign God, and in that relationship we find our true, and really only, hope.

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The Possibility of a Safer and More Humane World

Harold J. Northup, Consulting Chemist

Pawcatuck, CT

The promotion of international good will by every means possible is an excellent way to help carry out the Christian's requirement to "occupy till I come." Good relations with the Soviet Union are far more promising now with Gorbachev as leader. The Chernobyl, Afghanistan and economic problems also make possible a change in thinking about the usefulness of war to accomplish political objectives.

We should heed the biblical counsel: "By wisdom a house (or society) is built, and by understanding it is established." Biblical principles and experiences, along with lessons from history, psychology, psychiatry, sociology, economics, and political science can be a big help to persons who are endeavoring to bring about a safer and more humane world. Gandhi, Martin Luther King and the sociologist Danilo Dolci achieved tremendous sociological changes.

Countless individuals and organizations world-wide have laid an extensive groundwork leading to the means of controlling international conflicts. However, deep-rooted social and political-economic institutions have a powerful negative influence in this regard. One example is the colossal industrial-military complex, which Dwight Eisenhower warned against.

Intellectuals believe that international strife has a possible short-term solution. However, they believe that a long-term solution will be required for the complex world-wide economic, social and spiritual problems. It is my conviction that solutions to all of these problems should be initiated now with energy, imagination and every means at our disposal. Success with the "impossible" task of conversion from a military economy to a civilian economy would free trillions of dollars and rubles, which would go a long way toward solving economic, educational, industrial, environmental, sociological and other problems in the developed and developing nations.

An outline of helpful material will be distributed and used as the basis for discussion and questions. An extensive bibliography is included.

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### Nuclear Winter

Stanley Rice, The King's College, Briarcliff Manor, NY

Nuclear war scenarios before 1983 largely ignored the possible climatic effects of the smoke that would be produced by the nuclear explosions. Early computer simulations indicated that a severe "nuclear winter" could occur after even a moderate nuclear exchange. More recent calculations have taken into account such factors as the buffering effect of the oceans, especially in the Southern Hemisphere, and have concluded that the temperature effects would be relatively mild, producing at worst a "nuclear autumn". However, even these relatively mild temperature decreases could have severe effects on natural and agricultural plants. Natural plants may be harmed in summer by sudden temperature drops for which no time was available for acclimation. Crop plants are almost always more sensitive to environmental fluctuations than are natural plants. Also, a slight average temperature decrease could shorten the growing season, preventing crops from maturing. Finally, modern agriculture is almost completely dependent on an economic infrastructure for fertilizers, equipment, and transportation. Thus even a "nuclear autumn" could cause widespread starvation.

The Christian observer, however, is not interested merely in what would probably happen, but in what our nuclear technology makes mankind capable of doing. We are interested in the "worst-case scenarios" for religious rather than scientific or political reasons. I present two such scenarios. First, if a severe nuclear winter caused large areas of the earth to be covered with snow, the earth's albedo (reflected light) would be so great as to make recovery of warm temperatures impossible. If this does not occur, another danger could await the earth as it warms up from nuclear winter. Carbon dioxide could cause a greenhouse effect, which would speed up decomposition and respiration, resulting in even more carbon dioxide. This could lead to a runaway greenhouse effect that could make the earth too hot for life.

We should consider the religious implications of our ability, for the first time in history, to be able to wipe out life on earth, even though this is not likely to occur.

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In Defense of Nuclear War  
David F. Siemens, Jr., Mesa, AZ

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Comparative Analysis of the Nuclear Weapons Debate:  
Campus and Developer Perspectives  
Jack C. Swearingen, Livermore, CA and  
A. Peter Swearingen, U. Cal., Santa Barbara

Many statistics (e.g. numbers, tonnage, killing capacity) regarding nuclear weapons and their effects are available to both sides of the weapons debate, including weapon designers and antinuclear activists. However, the same statistics are frequently used to support very different conclusions. The debate can be better understood through analysis of the process whereby statistics (data) become information (i.e. data exchanged with contextual applications). The process is shaped by the convictions of each sector because the convictions determine how information is obtained, distributed, and used by a sector's members.

In this paper we consider the debate over nuclear weapons from perspectives usually taken by designer and campus activist. We look at the questions usually raised by each community, the common forms of communication used, and the role of objectivity in each. Nuclear weapons policy and apparent underlying assumptions along with countering views will be discussed. We observe that the perceived power of the members of each sector to influence these issues determines how they tend to use the statistics. Often the associated information becomes more important than the weapon itself. We look for Biblical perspectives that are independent of particular convictions about weapons for Christian members of these opposing communities.

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Two Faces of Science in Christian Perspective  
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What is the Christian perspective on science? Did science bring on weapons or hope? Those questions are closely related to the origin of science. Traditionally, two opposite origins of science were suggested in Christianity. One was mainly maintained by reformed scholars who seek the origin of human culture from the Genesis 1 and regard the scientific activities as a part of God's cultural mandate. Though there are a number of negative aspects in science, they suggest, those are not God-formed but man-deformed characters of science. Therefore, Christians should struggle to reform the deformed science. Thus the scientific researches of Christian scholars have been positively encouraged by churches. They hold from the history of science that such a reformational atmosphere gave a considerable influence to the advancement of experimental science, particularly during several centuries after the Reformation and the Scientific Revolution. Another origin of science was advocated by the Quakers, the Mennonites etc. They find the origin of culture (science) in the Genesis 4 in which Cain and his descendants built cities, played the lyre and pipe, forged all instruments of bronze and iron. Such cultural acts were motivated to ensure their security and enhance their pleasure going away from presence of the Lord. They assert that cultural acts including scientific researches have inherently sinful motives.

In this paper, we show that these opposite arguments are describing the different aspects of the same Christian view on science. This can be easily understood when we distinguish between the structure and direction of science, as Wolters originally proposed. According to Wolters, structure denotes the essence of a created thing, the kind of creature it is by virtue of God's creational law. Direction, by contrast, refers to a sinful deviation from that structural ordinance and renewed conformity to it in Christ. Applying the concepts of structure and direction to the controversy on the origin of science, Genesis 1:26-30 could be regarded as the structure of science while Genesis 4:16-24 as the direction of science. Such a distinction between structure and direction can give a consistent Christian explanation of the apparently contradictory arguments on science. And we try to interpret some extreme views, such as "Lynn White Syndrome" and "Merton Thesis", as a result of confusing structure with direction. We show that such a confusion could unavoidably face the dualistic dichotomy for our cultural activities. Whether science brings on weapons or hope could also be answered by the conceptual distinction of structure and direction.