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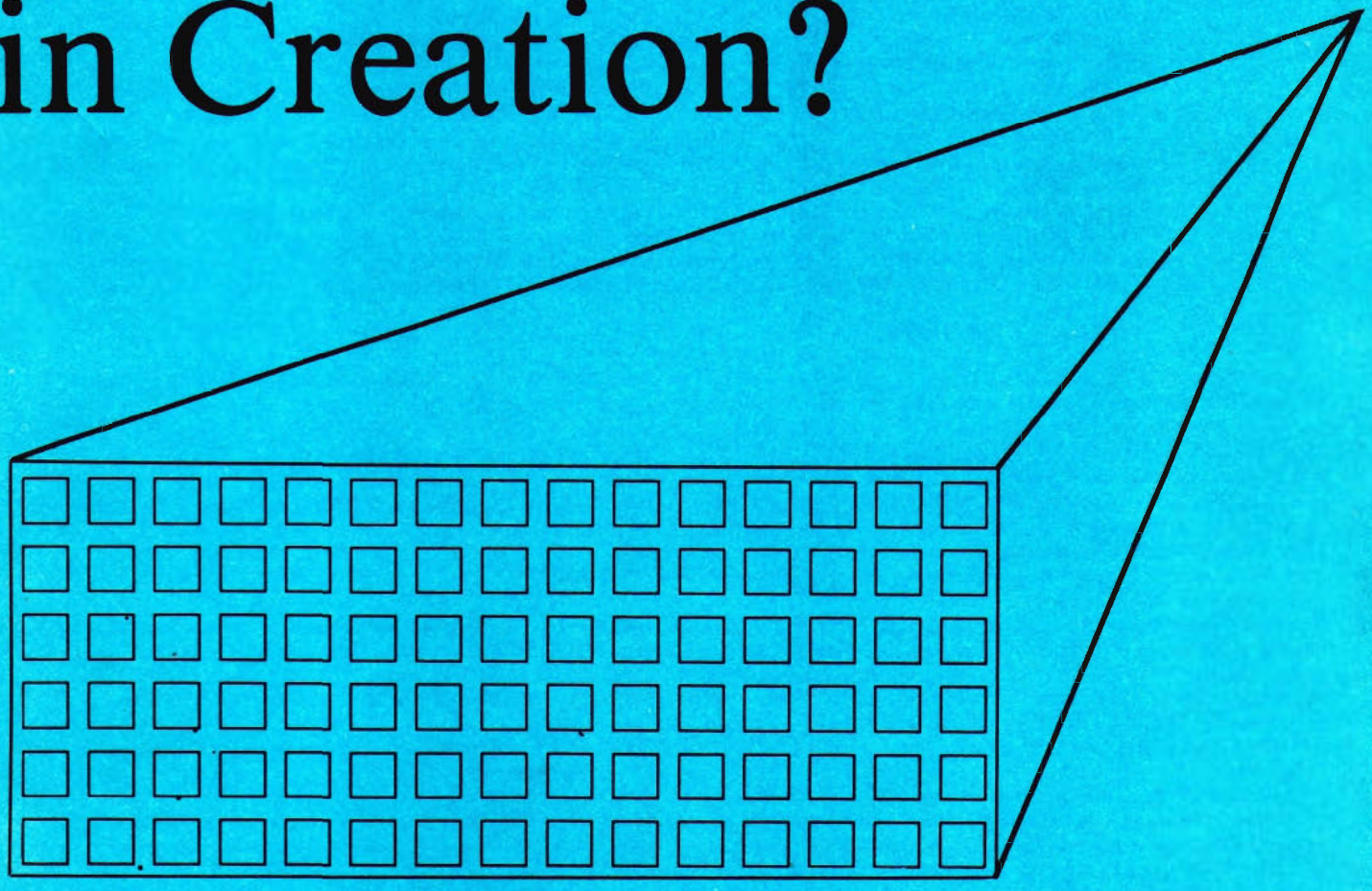
Unity in Creation?



"The fear of the Lord is the beginning of Wisdom." Psalm 111:10

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A Symposium

Is There Unity in Creation?

Christians believe that there is one God and that He created the whole world. Christians usually claim that many corollaries flow from this statement. For example, in one sense all men are brothers. Also, all men should unite and look in one direction—toward God. Men are united in other ways: they all die; for all there is one judgment; and there is but one way in which they can be made alive. Again, because all men are of one flesh they should exhibit this one-ness in a unity of purpose and action.

The corollaries to the fundamental statement also include statements of beliefs on matters other than those related to the goals of mankind. Thus, when Christians say that all creation ought to unite in praising God, they usually refer to more than the verbal praise of God required of men. For example, they believe that everything that man does—whether it is making music, selling real estate, writing poetry, or synthesizing new compounds—ought to unite in praising God, Who made us and the rest of creation. Finally, when Christians quote the bible directly and maintain that the heavens declare the glory of god, they confess that even creation quite apart from man is united in praising its Creator.

This symposium is an examination of only one of the possible ways of looking at the unity-in-creation concept. Is there unity in broad areas of knowledge, such as the physical scientific area, the artistic area, or the biotic area? In the present discussion the physical scientific area is of special interest. The participants have been asked if the existence or non-existence of unity in any of these broad areas of knowledge has any significance for our Christian faith. The reader should also note that the participants have also been asked to reflect on some related matters to the extent that those matters interest them. Therefore, the participants do not all discuss the same facets of the unity-in-creation concept; they share a common preparation only in that all have seen this introduction, not each other's contributions to this Symposium.

Russell Maatman

HOLISM AND REDUCTIONISM

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As theoreticians think about the foundations of their disciplines, the idea of unity holds a peculiar fascination for them. However, "unity" has been used in several different ways. Before discussing R. Maatman's book *The Unity in Creation*[1] I would like to examine some of the more important ways in which the term "unity" has been used by biologists and philosophers of science. I do this in an attempt to contribute to the discussion started by Maatman's book.

The Tendency Towards More and More Inclusive Explanatory Theories.

In physics, the trend towards one fundamental explanatory concept which can explain all the phenomena in the field is remarkable. Bromley, in a 1980 review, states:

> The past five years have been the most exciting, challenging, and productive in world physics since the late 1920's, just after the discovery of quantum mechanics. We appear to be on the threshold of an entirely new understanding of physical phenomena on a more fundamental level than ever before. And, gratifyingly, we find that in contrast to the fragmentation that characterized physics—and indeed many other sciences—in past decades, the underlying unity and coherence of our science is once again emerging.[2]

The unification theories bring under one explanatory roof, electromagnetism and weak and strong nuclear forces. Perhaps physics will be able to realize Einstein's dream and be able also to include gravitation in a unified field theory.[3]

Will biology be unified in a way similar to physics? Many biologists would like to see this; others feel that a unified theory will never be able to do justice to the great diversity of biological phenomena. Attempts at unification of biology have usually been based on the theory of evolution or on recent dramatic developments in molecular genetics.

The theory of evolution raises complex questions for the Christian. These have often been discussed in the pages of this *Journal*. Some Christians believe that progressive complexification has occurred under the guidance of the Creator; others do not. Not all Christians who accept a theistic version of the evolution theory accept that the theory is capable of unifying all of biology.

The functions of DNA, and related topics such as genetic engineering and viral genetics, are much in the news. Many biologists are of the opinion that an understanding of DNA has provided a key to an understanding of all biology. In this way, genetic theory is serving as a unification theory for many. The discovery of the structure of DNA by Watson and Crick in 1953,[4] and subsequent theories of its function, excited the biological community. It meant for this community the possibility of a truly mechanistic[5] interpretation of biological phenomena.

Perhaps it is because the theory of evolution was never able to free itself entirely of teleological connotations that there was such delight and excitement in the biological world over the discovery of the structure of DNA. Genetic theory complemented evolutionary theory, but, at the same time, provided a more mechanistic explanation for mechanisms of heredity and change.

How does one, as a Christian, evaluate the current fascination of the biological community with DNA? The first thing we need to say is that the structure and function of DNA have been elucidated by very ingenious and valuable work. We now have a fascinating description of the biological phenomena that lie at the basis of biological function. At the same time, in my opinion, it must be said that we would do an injustice to the complexity of creation if we identified the diversity of these biological phenomena with this biochemical substructure. It would be an injustice because many phenomena that biologists normally deal with are not suitable objects for biochemical explanation (e.g. phenomena in ecology or animal behavior). Thus, if we absolutize the role of DNA we lose some of the diversity of biology through a regrettable reduction.[6]

The tendency to absolutize the role of DNA is not confined to biology; it has spilled over into the social sciences. This is clearly shown in the controversy and events surrounding the book *Sociobiology: The New Synthesis* by E. O. Wilson. According to Wilson, an organism is merely nature's way of perpetuating DNA.

> In a Darwinian sense, the organism does not live for itself. Its primary function is not even to produce other organisms. It produces genes and serves as their temporary carrier. . . . The organism is only DNA's way of making more DNA.[7]

Furthermore, Wilson suggests, altruistic behavior in animals and people is a mechanism by which DNA, an individual's own or that of a related indivdiual, is preserved.[8] Wilson uses animal and human data to suggest that all behavior is completely genetically determined. Whether this is true of animals makes an interesting discussion, but most Christians would be quick to point out that it is not true for human behavior. To equate love of one's neighbor with the preservation of DNA is an inadmissible reduction because the biblical concept of human responsibility is lost in process. Sister Marie

Augusta Neal has written a sensitive, incisive, Christian critique of Wilson's ideas.[9] The fascination of the academic community with Wilson's ideas has led to their adoption in fields of study such as ethics[10] and psychiatry.[11] Dickson reports that extreme right-wing groups in Britain and France have used statements of sociobiologists to bolster claims of racial superiority and to excuse acts of violence.[12] While some academics defended Wilson's views, R. Lewontin suggested that the Chinese might refer to them in terms of the three vulgarities: "vulgar Darwinism, vulgar Mendelism, and vulgar reductionism."[13]

We have seen that unification has brought integrity and excitement to physics, is more difficult in the biological sciences due to the diversity of biological phenomena and sub-disciplines, and can be reductionistic when one attempts to unify by applying biological theories to social disciplines.[14] This should not imply that a non-reductionistic theory or set of theories will not be posited in the future. In fact, unification theories in physics have also been described as reductionistic or non-reductionistic, i.e. holistic.

As we describe ways in which the concept of unity is used, we see that one of these is in connection with holistic theories and another is connected with a school of thought with reductionist tendencies.

The Goal in Holistic Theories.

> The physical eclipse of mechanism . . . has emboldened biologists to approach their own subject matter in synthetic as well as analytic terms—to perceive *Gestalten* where once they could see only additive assemblages of parts. And with this radical shift in perspective has come a sharpened awareness of the meaning of process in living systems: namely, the recognition of organisms as active and dynamic centers of directive striving rather than as inert or static mechanisms responding only passively to external stimuli.[15]

The organism as a *unity,* a whole, and a coordinated center of biological activities has been the concern of several well-known thinkers. While many of these recognize the value of understanding isolated biochemical or physiological processes, they also feel that the complexity of such processes, their physiological context and meaning to the organism, must also be recognized. The term "holism" was coined by the South African general and statesman J. C. Smuts in his book *Holism and Evolution.*[16] In this book Smuts suggests that in order to understand biological phenomena or structures, an appreciation of wholes, whether these be atoms, cells, or individual organisms, is essential. He attempts to do this without falling back into a speculative vitalism, characteristic of eighteenth century biological thought. This was a trap that other theoreticians who were concerned with the problem were often not able to avoid. Marjorie Grene, in her discussion of Adolph Portmann's work, has also shed light on the topic of the animal as a center of activities.[17] When biologists address these problems, they inevitably bring the idea of purpose of biological structures and processes into the discussion, to the horror of biologists who are more mechanistically inclined.

The concept of system has also been used by some writers in an attempt to bridge the gap between mechanistic and vitalistic theories. Ludwig von Bertalanffy, who coined the phrase "general systems theory", has suggested that within many disciplines are systems (types of processes) that can be approached by basic equations with a cross disciplinary character.[18]

> For example, the exponential law or law of compound interest applies, with a negative exponent, to the decay of radium, the monomolecular reaction, the killing of bacteria by light or disinfectants, the loss of body substance in a starving animal, and to the decrease of a population where the death rate is higher than the birth rate. Similarly, with a positive exponent, this law applied to the individual growth of a certain microorganisms, the unlimited Malthusian growth of bacterial, animal or human populations, the growth curve of human knowledge . . . , and the number of publications on *Drosophila*.[19]

Von Bertalanffy gives equations for some of these processes, and suggests that in this way a unity can be perceived in the sciences. N. Weiner also describes systems, cybernetic or feedback systems, which apply to biology and other disciplines.[20] Von Bertalanffy has postulated his theory as an alternative to the unity of science concept suggested by the Vienna Circle (see next section).[21]

Holistic (or wholistic) theories have been described for many disciplines by scientists concerned with the integrity of the phenomenon being studied, the unity of the organism in which these phenomena occur, or in reaction to the fragmentation that results from reductionistic or scientistic theories.[22] In biology, holistic theories have received renewed interest by the environmental movement which, in turn, has received impetus, it would seem, from existentialism. Studies of topics such as biotope, ecosystem, food cycles and pollution, are an indication of this interest.

In an effort to do justice to such holistic theories and also to molecular, biochemical, and physiological topics, introduc-

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tory college textbooks often adopt the "multi-level aproach" or describe "levels of organization" in biological organisms.[23] Such books deal with molecular biology, the cell, tissues, organisms, populations, and environmental topics. Thus the choice between a mechanistic or a wholistic approach to biology does not need to be made.

The Goal of Logical Positivism.

> The scientific world conception is characterised . . . by its basic attitude, its point of view and direction of research. The goal ahead is unified science. The endeavour is to link and harmonise the achievements of individual investigators in their various fields of science. From this aim follows the emphasis on *collective efforts*, and also the emphasis on what can be grasped intersubjectively; from this springs the search for a neutral system of formulae, for a symbolism freed from the slag of historical languages; and also the search for a total system of concepts. Neatness and clarity are striven for, and dark distances and unfathomable depths rejected.[24]

In order to achieve this ambitious aim, logical positivism, the philosophy put forward by the Vienna Circle of thinkers, rejects all "metaphysical speculation" such as religious ideas or biological vitalism. Instead, this school emphasizes empirical verification, logical analysis, and takes physical science as a model for the other sciences. Several sources describe the ideas of this group.[25]

> ogy describe "experiences" made such a unification possible.[27]

The unity espoused by the Vienna Circle is one which is based on the application of the methods of mathematics and physics to biology and the social sciences. We feel this unity is achieved by doing violence to the integrity of created reality.

While logical positivism has been pronounced dead as a school within philosophy, it lives on in the practical empiricism held by scientists within the various disciplines.[28] Logical positivism has greatly influenced "the received view of science." Such practical positivism is illustrated in the rather naive philosophies espoused in opening pages of many books in biology. Witness this florid example:

> So intense and urgent is the human desire to uncover the secrets of the universe, both animate and inanimate, and even the mysteries beyond life, that much of the time, energy, and resources of many intellectually endowed individuals, have, since time immemorial, been expended in what is now called scientific investigation: the search for experimentally demonstrable truth.[29]

> Scientific information thus began to spread from country to country and, more recently, from continent to continent. Instead of a few great scholars who were thought (even by themselves!) to know everything, men began to realize that there were boundless deserts and plains and illimitable dark forests of ignorance only awaiting the axe and plow of the devoted researcher to yield rich crops of wonderful, golden knowledge.[30]

Unification has brought integrity and excitement to physics, is more difficult in the biological sciences, and can be reductionistic when one attempts to unify by applying biological theories to social disciplines.

Der Wiener Kreis was active in Vienna during the 1920's and 1930's. Some of its leading members were M. Schlick, R. Carnap, and O. Neurath. The group accepted some of the ideas of Ernst Mach, and maintained ties with prominent philosophers in other countries, notably the Empiricists in Great Britain. The group disbanded in the 1930's, and its doctrines are no longer widely held. However, we do well to look at the effects of the Vienna Circle on modern science and the ideas of the Circle on the unity of science.

We have seen that logical positivists insisted on a strictly empirical approach and were critical of metaphysical concepts. These concepts include not only religious or philosophical assumptions, but also such ideas as vitalism, entelechy, or even wholeness. This, in turn led them to reject such theories as intuitionism in mathematics, assumed regularity in physics, teleological notions in biology, and undefined entities in psychology and sociology.[26] While we must praise efforts to eliminate speculative or mystical concepts from science, the result of the Vienna Circle's critical approach has been its support of reductionistic schools within disciplines, notably behaviorism in psychology.

> One of Mach's main concerns, which the logical positivists shared, had been to unify science, especially by rejecting the view that psychology is about an "inner world" that is different from the "outer world" which physical science investigates. The doctrine that both physics and psychol-

Reaction against such an idealistic view of science was to be expected. Among scientists within the disciplines, the most widely read antipositivist author has been T. S. Kuhn. This author, oddly enough, published his book in "The International Encyclopedia of Unified Science", a series published by the logical positivist movement. An extensive review of this book has been published in this *Journal* previously.[31]

The Order in Creation Speaks of The Creator in A Unified Voice.

> In the first place, there can be no living science unless there is a widespread instinctive conviction in the existence of an *Order* of *Things*, and, in particular, of an *Order of Nature*.[32]

While philosophers have differed on whether there is order, either "out there" in nature or imposed by the mind, most practicing scientists believe in an ordered universe. Most have not thought about this distinction and expect an orderliness in the phenomena they study.

The Christian accepts by faith that this order refers beyond itself to a Creator. "Loving the Lord our God with all our mind must include using our minds in a search for the

patterns according to which events in his universe are reliably predictable," states Donald M. MacKay in one of his books.[33] Other Christian writers have written similar comments. The Dutch philosopher H. Dooyeweerd expresses as a major theme in his writings that "creation is meaning."[34] Thus, he says, creation points beyond itself to a *Creator*.[35]

We may conclude that for most Christians, it is an essential part of faith that creation proclaims the glory of God. For the Christian scientist "creation" is not only the mountains and trees, but also sub-particles of the atom, metabolism of vitamin A, the embryological development of the starfish, and the migration of fish, to give a few examples. Thus creation speaks of God in a "united" way.

Unity as Discussed by R. Maatman.

At this point we consider how Maatman uses the concept of unity in his book. He is a physical scientist, so it is not surprising that the origin of his fascination with unity lies in the physics, in the tendency towards more and more inclusive theories that deal with phenomena studied by this discipline. He discusses this in Chapters 3 and 4 of the book. At one point he states:

> We can make observations concerning the physical aspect of the universe. . . . We correlate our observations and express those correlations as physical laws. Further correlation shows us that many physical laws are related to each other; there is then a hierarchy of laws, so that there are only a few, but more inclusive, laws higher up. . . . The laws which are highest are sometimes referred to as fundamental ideas; physical scientists might yet develop a single law or fundamental idea at the top. . . . (p. 60).

In Chapter 5 the concept of unity is extended to include some aspects of our fourth point: there is a unity in creation which speaks of the Creator. There is structure and order that we perceive as we study natural events and processes. The notion of power is then introduced, first as a factor in cause-effect relations, then as an indication of God's upholding care in these events and processes. It is this power that for Maatman refers beyond creation to the Creator.

We owe Maatman thanks for pointing out to the Christian community that there ought to be a greater connection between our Christian commitment and understanding the theories of unity that are prevalent. Very little has been written by Christians in the sciences on this topic. I mention three points that need further clarification.

In the first place, Maatman presents unification of science as a goal. I have tried to point out that unity in science means different things to different groups of people. To some, especially those influenced by positivistic modes of thought, this unification has reductionistic emphases (see endnote 6). Maatman has stated clearly that he does not strive for unity if boundaries between disciplines are to be crossed (p. 129 and on). The Christian scientific community will have to work to clarify which uses of the concept of unity are acceptable.

A second comment is closely related. Maatman describes how different disciplines study different aspects of creation (p. 127). (This may be somewhat simplistic, as Maatman also knows, but we'll accept this for the discussion.) We cannot presuppose what these disciplines are, and where the boundaries between them lie (p. 130). *Within* an aspect, theories can be unified, at least potentially (p. 136). I appreciate in this line of reasoning that boundaries between aspects, disciplines, or whatever, are to be established empirically, rather than superimposed by a theoretical system. I also appreciate that by not wanting to unify if natural boundaries will be crossed, Maatman is attempting to prevent the reductionism found in some disciplines. My criticism here is that there seems to be a circularity in the argument: we can unify if natural boundaries are not crossed, and we perceive natural boundaries when our unification attempts fail.

My third point deals with Maatman's discussion of causality. There is a tendency, especially on p. 56, to discuss order and structure first, and then causality. In this way law, order, and related concepts have a tendency to become static concepts, devoid of the processes studied within a discipline. A concept of law, creation structure, order, etc., needs to include process, causality, and the like. God's upholding word, his law for creation, should not be seen as static, deterministic, or as a rational order. In other pages of the book, Maatman recognizes this and indicates that causality should not be seen as separate from creation order (pp. 64, 65).

The discussion started by Maatman is an important one which needs to be continued. We are thankful that he started it.

Acknowledgement

I am grateful for helpful suggestions by Drs. T. Van der Merwe and W. Van Dijk, and several colleagues at The King's College.

NOTES

[1]Russell Maatman, *The Unity in Creation*, (Sioux Center, Iowa: Dordt College Press, 1978). All further references to this work appear in the text.

[2]D.A. Bromley, "Physics," *Science* 209, (1980), 110.

[3]*Ibid.*, p 112.

[4]J.D. Watson and F.H.C. Crick, "A Structure for Deoxyribose Nucleic Acid," *Nature* 171 (1953), 737–738.

[5]Mechanistic, a term used in several places in this article, can be used in two ways. It can be taken to mean a mechanical (e.g. physical or chemical) explanation for a process that *can* be explained in such terms. It can also be taken to mean a commitment to the use of mechanical explanations in all disciplines, even those where, in my view, they do not fully describe the complexity of phenomena in this discipline (see also endnote 6).

[6]Reductionism has a variety of definitions. For this article we can say that a reductionist approach to one of the disciplines is taken when phenomena of a more complex discipline are explained in terms from a less complex discipline. For example, reductionist approaches to biology attempt to explain biological phenomena only in physicochemical terms. Reductionist theories have been postulated for most of the disciplines. Many Christians think these do an injustice to the integrity of creation.

[7]Edward O. Wilson, *Sociobiology: The New Synthesis*, (Cambridge, Mass: Harvard University Press, 1975), p. 3. The book is almost 700 pages long. It must be a source of irritation to Wilson to have the book reduced to a few cryptic sentences, such as the ones in this article.

[8]See also R. Dawkins, *The Selfish Gene*, Oxford: Oxford University Press, 1976).

[9]Sister Marie Augusta Neal, "The Challenge of Sociobiology," *Christianity and Crisis* 40 (1980), 342–349.

[10]A.L. Caplan, "In What Ways are Recent Developments in Biology and Sociobiology Relevant to Ethics?" *Perspectives in Biology and Medicine* 21 (1978), 536–550.

[11]M.T. McGuire, "Sociobiology: Its Potential Contributions to Psychiatry," *Perspectives in Biology and Medicine* 23 (1979), 50–68.

[12]D. Dickson, "Sociobiology Critics Claim Fears Come True," *Nature* 282 (1979), 348.
[13]*Ibid.*
[14]Margaret J. Osler, "Apocryphal Knowledge: The Misuse of Science," in M.P. Hanen, M.J. Osler, R.E. Weyant, eds. (Waterloo: Wilfred Laurier University Press, 1980), pp 273–290.
[15]Floyd W. Matson, *The Broken Image: Man, Science and Society*, (New York: Doubleday and Company, 1966), p 146.
[16]Jan C. Smuts, *Holism and Evolution*, (New York, Macmillan, 1926). Other authors concerned with wholeness are discussed by Matson (footnote 15).
[17]Marjorie Grene, *Approaches to Philosophical Biology*, (New York: Basic Books, 1965), Chapter 1.
[18]For von Bertalanffy's views on wholensss, the importance of the individual organism as a unit, see his book *Problems of Life*, (New York: Harper and Brothers, 1960). For a review see P.B. Medawar, *Mind* 43 (1954), 105–108. For a description of General Systems Theory, see L. von Bertalanffy, "An Outline of General Systems Theory," *British Journal for the Philosophy of Science* 1, (1950), 134–165. For a discussion, consisting of contributions by several authors, see Human Biology 23, (1951), 302–335.
[19]von Bertalanffy (1950), p 136.
[20]Norbert Wiener, *Cybernetics, or Control and Communication in the Animal and the Machine*, (Cambridge: M. I. T. Press, second edition, 1961).
[21]von Bertalanffy (1950), p 164.
[22]Examples of holistic approaches to disciplines are *Gestalt* theory in psychology (see the pioneer work K. Koffka, *Principles of Gestalt Psychology*, New York: Harcourt, Brace and World, Inc., 1935 and 1963) and structure functional theory in sociology (see, for example, R.K. Merton, *Social Theory and Social Practice*, New York: Free Press, 1968). C. Seerveld recently published a theory for a Christian holistic anthropology: "A Tin-Can Theory of Man," *Journal ASA* 33 (1981), 74–81.
[23]See e.g. D.D. Ritchie and R. Carola, *Biology*, (Reading, Mass.: Addison-Wesley Publ. Co., 1979), p 8; G.T. Miller, Jr., *Living in the Environment*, (Belmont, Cal.: Wadsworth Publ. Co., 1979), p 41.
[24]Otto Neurath, *Empiricism and Sociology*, M. Neurath and R.S. Cohen, eds., (Dordrecht: D. Reidel Publ. Co., 1973) pp 305–306.
[25]J. Passmore, "Logical Positivism," in *Encyclopedia of Philosophy*, (New York: Macmillan Publ. Co., 1967); Neurath, Chapter 9.
[26]Neurath, pp 311–315.
[27]Passmore, p 55.
[28]Passmore, p 56.
[29]M. Frobisher *et al.*, *Fundamentals of Microbiology*, (Philadelphia: W.B. Saunders, 1974), p 3.
[30]*Ibid.*, p 16;
[31]H Cook, rev. of *The Nature of Scientific Revolutions* by T.S. Kuhn, *Journal ASA* 25 (1973), 34–38.
[32]Alfred North Whitehead, *Science and the Modern World*, (Mentor Books, 1963; first published 1925), p 11.
[33]Donald M. MacKay, *Science, Chance and Providence*, (Oxford: Oxford University Press, 1978).
[34]Herman Dooyeweerd, *A New Critique of Theoretical Thought*, (Philadelphia: Presbyterian and Reformed Publ. Co., 1953) I, p 4.
[35]*Ibid.*, p 10.

UNITY AND COHERENCE

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The Christian confession of creation as expressed by Paul in Col. 1:16f, "all things were created in heaven and on earth, visible and invisible, whether thrones or dominions or principalities or authorities—all things were created through Him and for Him. He (Jesus Christ) is before all things, and in Him all things hold together," forms the context and the center stage for any discussion on the theme of unity and coherence. All creation finds its origin and existence (life) in Him and exists for Him (Rom. 11:36). The creational setting of the cosmos is therefore not a static one, but rather the creation is continuously upheld and dynamically directed towards the eschaton (Rev. 4:8,11). The creation on its pathway in history is subject to God's Law (ordinances, will) and thus nothing in reality is self-contained or self-sufficient. Its very meaning is found in being responsive to God's will.

The question before us is how this confession of the integrity and coherence of creation, despite the surd of sin, should impinge on and direct our scientific work. Several answers and pathways have been suggested in history. Maatman personally argues for a presuppositional physical science. Since "all men know there is a God and that He has eternal power" (Rom. 1:20) science cannot be properly taught or practiced without this supposition. In fact, we should find ways "to demonstrate for each aspect of creation that it is a coherent manifestation of God's creative and upholding power." The whole of reality is viewed as a coherent unity, a cosmos, and is therefore not subject to any disorder. The scientist acting on this presupposition believes all observations are interrelated and form a meaningful network.

The subsequent path of demonstration requires us to relate the physical order (regularities, observations, etc.) to God, the ultimate source of order. Certainly God is not physical in any sense nor is He the ultimate physical cause (although Maatman does describe Him as the ultimate cause). Thus this avenue of establishing a relation appears blocked. Maatman opts for another classical approach by suggesting that God, the Creator and Sustainer, acts coherently in a *logical* sense. It is of the essence of God's nature to be logically consistent and therefore faithful in a non-contradictory manner in his dealings with creation. Order in creation exists because God does not contradict Himself. Therefore, the order we should attempt to disclose in the physical aspect of creation is at bottom a logical order which is simultaneously the ground for any search for unity *in* creation. For example, the Deut. 6:4 passage, "The Lord our God is one Lord," is seen as revealing the essential oneness (the logical simplicity?) of God and thus condemns every form of polytheism. Any polytheistic parallel in physical theory is therefore also excluded. "The ultimate cause of our gravitational observations" cannot be in conflict with "the ultimate cause of our energy-conservation observations."

Since if there is a single cause of whatever men observe and this cause is subject to the logical law of non-contradiction, it follows that we must be able to logically relate and correlate our observations as we formulate natural laws. We should even be able to link these laws in a tighter logical network and thus conclude that there may exist one law (fundamental idea) or a small (simple) set of complementary laws or principles. Simply stated, any movement from many observations to fewer principles is a movement in the direction of greater logical unity. This unity, if reflective of God's nature, should be evident in our scientific endeavors. In fact, Maatman continues, the history of science is but the confirmation of this central principle.

It is unclear to me why the search for unity *in* creation has to follow this particular path. I think, if I may state it succinctly, it misreads the scriptural revelation on the Creator/creature distinction. It all too frequently interprets it in the scholastic mold of an analogy of being: Ultimate Cause, immediate cause(s); ultimate Unity, relative unity; Archetype (of these who care), ectype. Does this approach not support the idea that God is subject to logical laws or conditions that must necessarily hold for Him as well as His creatures? How can God then be considered as the Sovereign? If God is perceived as the Ultimate Cause, does this not rule out probabilistic approaches and stochastic processes in the sciences and argue instead for a (static) determinism? What remains of human responsibility in our scientific endeavors? Or are humans not subject to conditions in the manner physical entities are?

Although other questions could be raised, the major point I wish to explore is the validity of Maatman's claim concerning the historical development of science, "history . . . shows that physical scientists understand more clearly, as time passes, that there is but a single cause of all physical scientific observations." (p. 70) Taking science in its present form, Maatman wishes to derive from science (and ultimately from God's nature) the model of its explanation and understanding of natural phenomena. One key feature in this argument is the conflation of physical and logical order in the sense that the logical order reflects the physical order, i.e., the order in time of cause and effect is reflected in logic in the order of premise and consequent. This close "identification" also suggests that scientific knowledge is best acquired by taking the logical product of statements describing the components of natural processes, or conversely by empirically testing the truth of statements that are the consequences of higher-order theories or laws (fundamental ideas). In general one can ask if this approach does not assume a derivational reduction scheme is normative for physical theories, and further whether it rests on a methodological commitment to the logical unity of science.

The norm of derivational reduction is hardly met by most, if not all, extant physical theories. Efforts at axiomatization of theories such as classical mechanics, thermodynamics, classical electromagnetism, and quantum mechanics have not been all that successful. Often several axiomatizations are possible for a physical theory. In the main, scientists come up with descriptions of various structures and regularities that are related, for example, by having a common object of study, rather than by being immediately deduced from a common set of fundamental ideas (laws) or axioms. I do not mean to minimize the role that reduction and axiomatization can play in the development and extension of physical theories. But it cannot be the dominant theme. If it were the "name of the game" or ruling paradigm, we would have to either discard many of our physical theories or issue promissory notes, due who knows when.

One brief example illustrates this points. Despite many efforts, the classical program of physics "tracing the phenomena of nature back to the simple laws of mechanics" as Heinrich Hertz expressed it, has not been realizable. The universal validity of the second law of thermodynamics could not be reduced to dynamics, or conversely, Carnot's principle as expressed in the second law does not follow from the conservation of energy (first law of thermodynamics). Even the statistical regularity of systems composed of a large number of molecules, as described in statistical mechanics, could not be reduced to classical thermodynamics. The macroscopic irreversible processes described by the second law cannot ultimately be explained by the reversible motion of microscopic entities. Spontaneous fluctuations at the microscopic level had to be introduced as an irreducible *Fremdkorper* into the theory. Classical thermodynamics and statistical mechanics appear to be physically complementary, each with a different range of validity and application.

Limits of space prevent me from discussing other examples, but an examination of the relations between, say, special relativity and general relativity or between classical chemistry and quantum chemistry will cause similar reductive issues

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to surface. We are faced with a plethora of theories and laws many of which are not related to each other in any apparent or imaginable deductive scheme. If that is the case, what does it say about the claim of (logical) unity in science? I would maintain that a different historical point can be made. Efforts to find unity within creation tend to conflate or reduce one physical theory to another, and consequently minimize the diversity of approaches that are required in the investigation of typical structures of matter (e.g. atoms and molecules).

Despite the existence of a range of general, universal laws (laws of motion, special theory of relativity, laws of classical thermodynamics, conservation laws) and some more restricted ones (laws of classical electromagnetism) none are capable either singly or jointly of explaining or giving an adequate account of the structure and stability of an atom of a particular element. By emphasizing only the more general relationships in reality insufficient recognition is given to the fact that physical entities are generally individuals of a certain kind. As integral wholes with their own typical structure (law) they are often irreducible to their constituents. Such instances must not mean that we declare the classical, more general theories to be invalid, but should rather encourage us to develop an understanding of reality in which the mutual dependence of theories and laws is highlighted and honored in our scientific work. For an elaboration of this position, see the recent book by M.D. Stafleu, *Time and Again: A Systematic Analysis of the Foundations of Physics*, Wedge Publishing Foundation, Toronto, Canada (1980).

The theme of unity and coherence properly explores the mutual relatedness of all things in creation. Man, as the crown of creation, and all creatures great and small are inter-related and inter-dependent. The creational setting in which man finds himself—as revelation—requires that he respond to God's call and act responsibly in unfolding, disclosing, and even enjoying the richness and diversity of potential and actual structures. But no structure or relation—whether physical or logical (or analogically conceived)—can grasp or encompass the radical character of the creature's dependence on the Creator. There is always a sense in which the very structures themselves defy analysis and explanation. Their individuality and uniqueness harbor the mystery of creation: the divine origin and continued sustenance of all things.

No structure or relation can grasp or encompass the radical character of the creature's dependence on the Creator. There is always a sense in which the very structures themselves defy analysis and explanation.

SHAPING A UNIFIED PERSPECTIVE

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The cosmos appears incredibly harmonious to me as a physicist, exhibiting a deep unity among its structures within its various domains. At least such a coherence appears authentic when we view the world through our conceptual apparatus of ideas, and of course we cannot easily lay aside this apparatus. We are quite naturally led to ask whether or not this appearance of unity is a false impression, or perhaps wrongly formulated. What, in fact, shapes what we find? Will our unifying perspective of today escape a demise similar to that of the adamantly affirmed ones of past ages?

To get at these questions I wish briefly to consider what has shaped past unifying perspectives, what might be called world views on the grand scale, and to discuss what factors led to their reformulation or abandonment. My purpose is to clarify what, in fact, it means to have a unified viewpoint, and to understand better the factors that have shaped it. We should then be more sensitive to the strengths as well as the limitations of a unifying perspective. Finally I suggest a direction for future unifying efforts. In this short essay I cannot thoroughly consider the full historical support for my premises, but I tentatively put them forth for discussion.

From historical studies it becomes clear that the *nature* of the unity or unifying perspective that a scientific community adopts is strongly shaped by the community's accepted aim or goal for the scientific endeavor. Furthermore, whether explicitly or tacitly, this adopted aim then influences the choice of scientific procedure to be adopted and, most importantly, it sets the stage for what the community means by explanation. The particular explanatory perspective adopted may in turn influence the perceived aim—but the point is that the interaction of both sets the course in the search for unity. (Naturally this is true only if the aim

adopted judges the search for unity as a potentially rewarding endeavor. I assume that it does).

An outstanding illustration of such influences can be seen in the important squabble between Galileo and his contemporary Aristotelians. The Aristotelians can be criticized for their narrow mindedness but not for their lack of a unified system. Their scheme was highly rational and systematic and even led to "deep" explanations. It provided a common-sense way of studying nature, and suggested appropriate questions, even appropriate experiments, while judging others to be improper or irrelevant. But Galileo broke with the Aristotelian perspective when he redefined the *aim* of science; he formulated a different aim for science, and with it, a new notion of what was meant by explaining something. This new focus led to a new methodology. Science became a search for the quantitative (such as size, weight and number) instead of for qualities (such as color and taste). The task became one of explaining nature by *reducing* it to a *new* conceptual set, the mathematical. So while an Aristotelian "explained" motion by identifying certain qualitative aspects and relating such to essential properties, Galileo searched out quantitative relationships and "explained" the phenomena in terms of mathematical relations. These new relations became the real essence of nature. And of course, neither was happy with the other's scientific aim or categories of explanation.

Certainly Galileo is not the only illustration of such influences. Issac Newton also introduced a significant shift in aim and explanatory concepts, as he sketched in the *Principia* and in *Opticks*. The search for a scientific understanding became a new search for a unified perspective, and this was to be gained by first investigating the phenomena using analysis. Analysis, for example, isolated the crucial forces behind the phenomena and also aided in formulating a theory relating the forces to phenomena. The success of this endeavor was to be demonstrated by then applying the theory and forces to new phenomena. If success were then achieved, Newton claimed a new unification that could be put forth as an explanation of the phenomena. Nature's secrets had been laid bare, or at least more bare. Certainly in this Newton marvelously succeeded although it must be said that, in fact, he was not completely satisfied with the completeness nor finality of such an explanation. But the initial goal was to have ended here. A new category of explanation—that of force—was introduced. Of course Newton's contemporaries were not all happy either with his aim or his category of explanation. Leibniz thought it akin to re-introducing occult causes; the Cartesians thought it to be lacking the real and essential mechanisms and in violation of indubitable maxims as well.

The important thing for us to note is the central controlling influence that the different aims exerted in shaping the nature of the perceived unity and the character of explanation as well. Galileo's aim differed from that of the Aristotelians, and Newton's from the Cartesians. Each shift in aim modified the nature of the unity expected and accepted.

Now when reviewing such historical struggles, it is tempting to conclude that the essential feature evident is the maturation of science. Science has matured—that I do not wish to deny. However, it is not always clear that a particular shift in scientific aim or in the criteria for what constitutes a good or a complete explanation, is in fact, progressive. Maybe progress was made; or maybe something (not necessarily everything) was lost. But what *is* clear is that one's judgment is shaped to some extent by his perceived aim for the endeavor. In any case, maturation and progress often come about by adopting a new aim.

Thus historical and philosophical enquiries have led us to recognize the existence of a very complicated situation. We cannot hope to get at nature at a deep level without using theoretical structures to help us define, develop and interpret the needed conceptual ideas. And of course the accepted aim for this endeavor influences our choices of theories and guides our thinking about what we expect to learn about nature from such theoretical/conceptual structures as well. However it is

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hard to escape the fact that, to some extent, concepts and theories interact, and meaning and explanation emerge within the context of the theory. Such rational schemes can powerfully extend our probings into the deep structure of nature and therefore help us carry out the perceived aim. But of course their adoption also brings a certain degree of tunnel vision or blindness.

When we attempt to get at the essence of nature, we, at least in the physical sciences, must rely upon these theoretical-conceptual schemes. We use them to identify and analyze phenomena, to formulate our questions. And if we are "lucky" (as were Newton and Einstein) we can formulate more universal, more profound and deeper unified theories. We then hope that these theoretical schemes capture the deep relations of nature.

But then what happens? These formulations are often turned around to interpret what nature is like! Thus while Newton interprets some of nature's characteristics using his mechanics, Laplace extended its applicability to more dogmatically tell us what nature is really like—it then became mechanistically deterministic because *theory* said it was so. But was it not the aim of the scientific endeavor to do just this, to formulate theories that then can be used to get at nature at a deeper level? I think so. We still do it today. Indeed, some would argue that such Laplacian naivete has been displaced after the advent of quantum theory, because quantum physics now tells us what nature is really like. Our aim, you see, is the same—to get at nature at an ever deeper and deeper level. But obviously there are pitfalls there, for we so easily absolutize our present conceptual theoretical perspective.

Where do we end up? The aims of the scientific endeavor, carried out by means of concepts and theoretical structures and networks of such all come to shape what we accept as explanatory. Thus the unity that one finds is determined, at least in part, and limited by this aim. Is this subjectivism? Need we therefore become skeptics, plunged into total subjectivism or into an extreme idealism in which our perceptions are so distorted by our minds and by our aim that we learn nothing of the real world?

Certainly historical investigations that bring to light the great distortions of the past may indeed make one skeptical of the present scientific endeavor, leading one to believe that its trustworthiness is no greater than those of yesteryear. But while I think that this critical attitude offers an important corrective to an overly naive confidence in our own conceptual perspective that is only too easily absolutized, I still think that it is much too pessimistic. Yet it does seem hard to find the narrow way between skepticism and a naive view of science. But where do we turn? Need we give up even a modest realism?

Some have tried to resolve the dilemma by arguing that the aim of science should *not* be one of getting at the deep levels of nature. They suggest that our aim should be to economically organize phenomena in an instrumental sense. In this view of science such claims to knowledge are so weak that one simply lives with a great deal of relativism. But it seems to me that such an extreme instrumental portrayal of science, even though more sophisticated than that of the positivists, still misses the very heart of what we have hoped for in the doing of science. For example, it does not harmonize with Einstein's central motivating drive to get to the essence of nature. I think that we must be slow in accepting an instrumental view. We must resolve the subjectivity problem by another road.

Since God created man and the cosmos together, should we not expect a complex interaction to exist between the perceiving subject and creation, which also must be reflected within an overall unifying perspective?

Furthermore, if there is to be any convergence, any progress to the endeavor, and there certainly seems to be such, this must mean that in part the initially adopted aim itself must be shaped and not arbitrary. But by what? It would seem that such guidance must come not only from our own conceptual choices and rational thought as we wrestle to make sense of the phenomena, but it must also come somehow from nature itself. Yet at any present moment one cannot forget the importance of the guidance provided by one's aim.

I think that we can learn something from this complicated picture that too often leads to skepticism. Indeed I think that our Christian perspective can give us an important directive. We should perceive a yet different aim for the endeavor. If so, of what sort? If we accept as a tentative goal the search for unity, should not this unity be one including both creation and its perceiving rational creatures? Since God created man and the cosmos together, should we not expect a complex interaction to exist between the perceiving subject and creation, which also must be reflected within an overall unifying perspective? (And such interaction need not be limited to that proposed by Niels Bohr.)

The existence of such an interaction would not necessarily make our task more futile or radically subjective, but more challenging. It warns us that when we study and theorize about nature, our categories of conceptualization cannot help but have some effect upon what unities we perceive—and so we must work hard also to discern, but not necessarily eliminate, the correlations between creation and our conceptualization of it. This added dimensionality perhaps helps us understand why there are so many different vantage points from which to stand and analyze. Furthermore, the challenge is to *relate* these different vantage points, perhaps as different levels of explanation. The nature of the unity we might

expect should be sought in a likely complicated, multi-dimensional set of conceptualizations and theoretical structures—all of which organize *not* just creation, but creation and the rational creatures that perceive it. And when we examine the broad perspective from multiple vantage points, are we not seeing cross-sections of such a complex unity like projections of a multi-dimensional function?

Of course one may argue that we have lost the objectivity of science. But if we wish to maintain a modest realism as our aim, then I see no clear alternative. But of course we have transformed the focus of science from an isolated study of "objective phenomena" to one that acknowledges that the full story is to be found in integrating the complete set composed of rational observer and his conceptualizations with the phenomena. It can then be our hope to really get at nature. And this hope, as Kepler and Galileo recognized, is ultimately based upon the reality that God has created ourselves and nature in unity.

We can likely make some progress in focusing upon only part of this total. But to push forward toward a deeper unity, we need to seek a unity of the whole. This then becomes our higher aim for the scientific endeavor, and we should seek unified perspectives that converge to this whole.

TWO UNITIES?

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The unity in God's creation stems from the unity of God himself. But just as the doctrine of the Trinity tells us that God is one in a profound, and not a simple, way, it will not be surprising if the unity displayed in creation is highly subtle, and not of the common-sense variety. It is not obvious that the physical universe forms a real unity, and overly simple attempts to present a unified description of the world, such as that based on Newtonian mechanics, will fail. (And it is no accident that the reign of the Newtonian world view coincided with a period in which unitarian heresies had great popularity.) The unity of creation is a matter of religious faith, connected with the biblical insistence that God is *Pantokrator*, the Almighty (e.g., Rev.4:8).

The unity of the universe is also a matter of scientific faith. Einstein's affirmation that "The Lord is subtle, but he is not malicious" means that, beneath the baffling complexities of the world, there is sense. It seems to me that it would be difficult for a person really to be a scientific seeker after truth without such a belief in the understandability of the world. And if the entire universe makes the same kind of sense, then it has a unity, for the sense, or the pattern of phenomena, is a basic part of reality.

Now if there are parts of physical reality that have a different kind of understandability from that of the realm of human senses and minds, it is hard to see how we could interact with them or know them. What would carry the messages, and which realm's laws would they obey? This does not mean, of course, that further exploration of the universe may not upset our present understanding of the laws of nature, but the tendency of such exploration will be toward the discovery of more general laws, to which our presently known ones are approximations. At least that will be the case if our faith in the understandability of the universe is to be vindicated.

Such arguments are very general, and rather vague. How well do they hold up under the rigors of the actual scientific enterprise? And where should we begin the search for unity? How intimately united are the different aspects of reality? The fact that the scientific investigation of the universe is still in progress means that only tentative answers can be given to such questions, but I believe that the present state of our knowledge makes it plausible that reality does, in fact, possess a high degree of subtle unity.

One way to begin the search for unity is to seek for a fundamental level of structures and interactions, in hopes that diverse complex phenomena may be explainable in terms of a unified description at the basic level of physical reality. The atomic theory of Democritus is an example of such an approach, as is any attempt to explain reality in terms of continuous field-structures. The Newtonian attempt to explain phenomena in terms of particles interacting via forces falls in this category. It failed largely because the fundamental level of reality was imagined to be in accord with common sense, but a considerable amount of success in providing a unified description, especially of astronomical phenomena, was achieved.

In modern times, attempts to find a unity in some fundamental level have been associated with unified field theories. The hope has been that all fundamental interactions can be understood as manifestations of a single field-structure of sufficient mathematical richness. Maxwell's welding of the electric and magnetic fields into a single electromagnetic field provided the first example of this, though a full understanding of the situation came only with the special theory of relativity. Einstein attempted for the last thirty-five years of his life to generalize his relativistic field theory of gravitation to encompass all physical phenomena—without success, in the view of most physicists. More recently, attempts to provide a unified description of elementary particle phenomena in terms of the type of quantum field theory associated with the names of Weinberg and Salam have had consider-

able success, especially in the unification of the weak and electromagnetic interactions.

It must be realized, however, that such successes involve unification *at* a supposedly fundamental level, and not necessarily further unification *from* the fundamental level. They show that the phenomenon of beta decay and the operation of electric motors have a common basis, but do not provide new insight on, for example, the old question of whether or not biological phenomena are explainable in terms of the fundamental interactions of physics.

It is not, however, only at this fundamental level that it is possible to search for unity. On the contrary, it may be possible to discern sense and unity precisely in very complex structures that resist complete reduction to simple components. Hofstadter's recent book *Gödel, Escher, Bach: an Eternal Golden Braid*, (Basic, New York, 1979), develops this idea very well: Ant colonies and brains make at least a different kind of sense when seen as a whole than they do when considered only as conglomerates of thousands of ants or millions of cells. We must look at entire complexes of events in order to make sense of them.

MacKay has made a similar point in a more explicitly theological setting in *The Clockwork Image* (Inter-Varsity, London, 1974). Here the example of an advertising sign composed of many light bulbs is used. While one can deal with this system at what corresponds to the fundamental level of basic interactions, describing the pattern of electric currents in the system, that description will probably not grasp the important fact that the lights spell out words. This aspect of order in the system must be sought at the top structural level, and not just at the level of basic units and physical laws. That means that there are two types of unity to be considered as well. Different signs will have in common the laws of electric circuitry which govern the fundamental units. But their messages also share a common membership in the English language—or, more generally, in the family of human languages. And the rules of English cannot be deduced from circuit theory, any more than Kirchoff's laws can be derived from "Eat at Joe's"!

So there seem to be two ways in which we could approach the issue of unity in creation—we can deal either with a supposedly fundamental level or with highly organized levels. A biological organism is a unity, and shares in an even higher unity with all the other organisms, living, dead and to be born. But it is a unity built up through many levels, and ultimately connected with the basic level of fundamental physical interactions that we try to explain with such structures as quantum fields. If it seems that the latter unity is the real one, and biological patterns and unities "merely" derived ones, it should be remembered that in practice the fundamental level has been reached by attempting first to explain phenomena on the level of everyday experience. In addition, the supposedly fundamental level may turn out not to be so—the successive analysis of matter into atoms, electrons and nuclei, protons and neutrons, and now quarks, illustrates this point sufficiently.

Two unities—doesn't that contradict what was said earlier, that there are not separate islands of sense in the universe? Not necessarily. The course of science up to this time can give us some confidence that these unities are the same. Certainly no one has derived the structure and behavior of the human brain from quantum field theory with full mathematical rigor! But there has been enough success, from artificial synthesis of organic compounds to current work on molecular biology, to justify confidence that biological phenomena are rooted in basic physics. There is no reason yet to believe in any discontinuity.

But that is not a vindication of any simple reductionism. It is true that we may understand many life processes in terms of molecular physics, but many of the phenomena with which we are concerned at high structural levels are not even meaningful at the fundamental level. It is not just that a single neuron or electron cannot think, for example, but that the concept of thought does not enter into the description of such entities.

Though it seems very plausible, then, that the unities that we discover at opposite extremes of complexity—the universality of the genetic code and the group structures of elementary particles—are the same, this is ultimately a matter of faith on the part of scientists. Given the limited capacity of created minds, it may never be possible to *prove* that there is no discontinuity at some intermediate level. But it goes against the grain of the scientific enterprise to introduce such a discontinuity in our thinking without sufficent reason. The faith of a scientist in the understandability of the universe is here in agreement with the Christian belief in the unity of creation.

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This agreement should not be surprising, since modern science developed only in the intellectual tradition nourished by the Judaeo-Christian view of the world. Scientists who may have no interest at all in formal theology or in Christianity as a faith for their own lives are still indebted to Christianity for providing science with an insistence that the universe is a unity and comprehensible to human minds. One need not be a Christian in order to discover fundamental truths about the physical universe.

The complex character of the unity that science has discerned in the world is consistent with what Christian theology suggests about creation. We are not concerned with the creation of a unitarian clockmaker. The tension between unities at fundamental and upper levels matches that which any serious thinker will always find in the doctrine that the One God is the Holy Trinity.

There are two ways in which we could approach the issue of unity in creation—we can deal either with a supposedly fundamental level or with highly organized levels.

UNITY THROUGH COMMUNICATION

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There is a biblical theme that reveals how man can actively accomplish the cultural mandate of Genesis 1:28: "Be fruitful and multiply, and fill the earth and subdue it, and have dominion over all created reality (my translation)." The theme is that of God the communicator. In the Gospel of John we are told that the "Word became flesh and dwelt among us" thereby communicating to us (note that words are key elements of the human communication process). Earlier in John the "Word" was identified as God and as being the Creator of all things. Furthermore Psalm 19 declares that God communicates to us through created physical reality: "The Heavens are telling the glory of God . . . their voice goes out through all the earth, and their words to the end of the world (Psalm 19:1–4). The God of the Bible is seen to be an active communicator in all that He does; and, as human beings are made in God's image, they also should be active communicators. Indeed it can be argued that all of human endeavor is most creative and exhibit the most unity when full and open communication exists between all the participants in humanity's many varied disciplines.

The following communication model is presented as a framework from which to study and actively participate in the spectrum of disciplines that form the ongoing cultural tradition. This model is adapted from the ideas of William W. Watts as contained in the article, *Natural Science and the Christian Faith in a Cultural Continuum*.[1] It portrays all the disciplines as most creative when actively communicating both with a many-faceted physical reality and with a philosophical-religious framework that acts as a common base to undergird all human activity. This philosophical-religious base must, in turn, be in open communication with physical reality through which God often reveals His purpose toward His creation. Figure 1 portrays the main features of the model which are now presented in outline form.

The Basic Propositions

1. Communication is at the heart of the very nature of God. Before the creation, Father, Son, and Holy Spirit were in communion with one another.

2. Human beings are made in the image of God. They can therefore participate in communication with God.

3. Through two-way communication with God, human beings develop insights that grow into a philosophical and religious framework that motivates and guides in all endeavors.

4. Philosophy and religion are in continual communication with a physical reality that was created by and is continually held in being by God. Such communication enables philosophy and religion to be open to what God reveals through His prophets (Special Revelation) and the grandeur and variety of physical reality (General revelation).

5. The various cultural disciplines come into being as a result of communicative interactions with a many-faceted physical reality. These cultural disciplines flourish as ongoing communication between the philosophical-religious base provides presuppositions that creatively guide the dialogue with

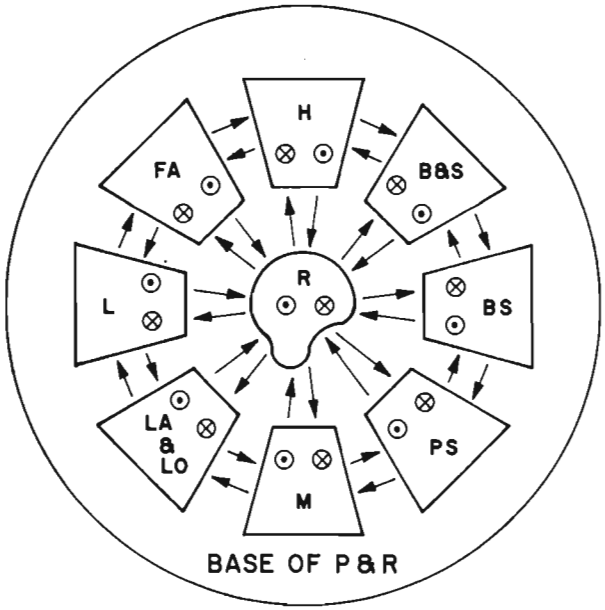

Figure 1. A communication-oriented model of the cultural continuum. Physical reality (*R*) is seen in continual communicative interaction with the various cultural disciplines, the disciplines being in continual communication with one another (All these communication linkages are represented by arrows ⟷). The cultural disciplines are: Mathematics (*M*), the physical sciences (*PS*), the biological sciences (*BS*), the behavioral and social sciences (*B&SS*), history (*H*), the fine arts (*FA*), literature (*L*), and language and logic (*LA&LO*). Underneath the various cultural disciplines and their communicative linkages with each other and reality is a base of philosophical systems and religious frameworks (*BASE OF P&R*) which provides a reservoir of concepts to which all the cultural disciplines turn for motivation, inspiration, and new insights. The heads and tails of arrows (⊙, ⊗) symbolize communication linkages in both directions between the philosophical-religious base (shown in the diagram to be below the cultural disciplines and reality) and both the cultural disciplines and reality. The latter are transparent with respect to the arrowheads so those communication linkages can be shown. The web of communication linkages between the various disciplines, reality, and the philosophical-religious base binds the disciplines together to form a *cultural continuum*.

physical reality.

6. As the various disciplines grow, communication between neighboring disciplines is established. These newly-formed communication linkages enable insights, concepts, and techniques from one discipline to be modified and adapted to the activities of other disciplines. Such "cross-fertilization" of ideas enables all disciplines to be more creative. Eventually even widely separated disciplines become aware of each others activities as information flows through the network of neighboring communication linkages.

7. Each discipline is distinct as it relates to only certain aspects of a rich and varied physical reality. These differing aspects cause each discipline to have its own subject matter and its own methods. Yet all the disciplines are united together by communication linkages between one another and the philosophy-religion base. Thus they form a cultural continuum, differing but nevertheless sharing a common base of presuppositions whose consequences are worked out by the disciplines in distinctive ways.

8. Sin operates in the world by jamming true communication both between God and its creatures, and between human beings. The first loss of communication results in the development of faulty philosophical and religious presuppositions. Such presuppositions inhibit proper communication between physical reality and the various disciplines, so that the disciplines develop in a distorted way. One of the most common faulty presuppositions is reductionism that occurs when workers in one discipline make the claim that the concepts and methods of their discipline are sufficient to exhaustively explore and understand reality. The insights of all the other disciplines are then "explained away" as not being unique but merely reducible to the concepts of the given discipline. Lastly, further distortion results as the neighboring disciplines no longer communicate accurately with one another, for all communication has been twisted by sin. As a result ugliness results where God intended beauty to be present, and the various disciplines are no longer integrating their varied insights in a holistic fashion to truly form a cultural continuum.

Presuppositions of Biblical Philosophy and Religion

What are some of the presuppositions of biblical philosophy and religion that aid all the disciplines of the cultural continuum in maintaining good communication between

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themselves and physical reality? Some key presuppositions are now listed.

1. Reality at even the most complex level possesses a rational structure, often deeply hidden in unfamiliar patterns. Therefore reality can be comprehended by human beings who exercise their God-given rationality in creatively "fusing together common elements from various apparently diverse experiences"[2] to bring into view new patterns of order.

2. The biblical God is perfectly free in all of His creative activity, hence reality is contingent. Reality possesses regularities and patterns, as its Maker is rational, but these regularities and patterns cannot be predicted *a priori*, as He is free; they must be discovered by examination. Therefore communication with physical reality by observation, experiment, and dialogue (in the human-centered disciplines) is a necessity for *all* the cultural disciplines (I would argue even mathematics has grown when related to the understanding of physical phenomena.)

emerge relatively unchanged under wide geographical and cultural shifts.[5]

These presuppositions, and others taken from a biblical philosophical-religious base, provide a framework that can integrate and unify the many components that make up the spectrum of human disciplines that explore physical reality. The effect of these presuppositions and the communication between neighboring disciplines jointly results in the disciplines being united to form a cultural continuum, rather than each discipline existing independent of all other human activities. Such unity is ultimately based upon the notion that the universe is a cosmos, not a chaos; for human beings, in all their creative efforts, act as if some order exists both in the medium they are using and in the portion of reality they are attempting to portray. Even those artists who base their work upon random patterns have tacitly accepted some notion of order, for randomness can be defined only in the context of some notion of order. It is in terms of the biblical doctrine of God, the Father Almighty, Maker of Heaven and Earth, that we are guaranteed the existence of cosmos, not of chaos.

All human disciplines are most creative when actively communicating both with a many-faceted physical reality and with a philosophical-religious framework that acts as a common base to undergird all human activitiy.

3. Honesty, an ethical dimension, is necessary for the well-being and healthy growth of any human discipline. Ethical statements must come from outside of any science as they are not falsifiable by experience (Popper's Criteria). If you say, as an example, that it is *wrong* to bear false witness, you say something that cannot be proved or disproved by experiential facts.[3] Ultimately ethical imperatives emerge from a philosophical-religious tradition to which society is committed.

4. God has deeply embedded beauty in all His creation and has given human beings the ability to respond to that beauty. Therefore aesthetic considerations are an important component of all human disciplines. A key element in such considerations is the finding of unit in variety, which as Coleridge noted,[4] is central to the concept of beauty. This is illustrated by the creative role that invariance principles play in art and science. An invariance principle postulates that some observable quantity will maintain its shape or form as it undergoes some type of transformation. As an example of such a principle, regularity of shape or pattern is responsible for the same shape or pattern being observed when a specific rotation or translation of the object occurs. This is why many flowers, animals, as well as paintings appear beautiful to a human observer; it is also of great use to the physicist in working out crystal structures. But the human sciences utilize the invariance concept as well; anthropologists look for basic components of human nature that remain the same under geographical and cultural shifts. For example, the basic human need for love and forgiveness, or the need for esteem

Biblical religion, which as Stanley L. Jaki has argued[6] is responsible for the birth of modern science, has also long provided inspiration to the written and visual arts (indeed the literary form of the Bible is artistically of the highest caliber). It is therefore ideally suited to the role of being a source of insights that can integrate and bind all the disciplines of man into one cultural continuum. Indeed such a continuum is but one manifestation of the unity of God's creation.

Finally I stress again that this model is based upon the biblical concept that communication is central to the creative activity of God and the human race. The Judaeo-Christian religion at its very heart stresses that "no man is an island" and that human beings needs companionship even when engaged in creative activity. And companionship is deeply rooted in undistorted communication. In this context science has been shown to be an activity done in conjunction with others, a community activity.[7] In other fields, artists, writers, those engaged in the humanities, and religious worshippers are often thought of as acting in isolation during their creative moments, but even here community with other members of their disciplines plays a role at some point in their development as creative contributors and participators. Community, grounded in mutual communication, is thus seen to be another way in which God unifies all His creation.

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AN ESSENTIALLY RELIGIOUS UNITY

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I believe that there is a fundamental unity encompassing all things that exist. By this I mean that there is a single meaning and purpose in which all things in the world participate and to which they contribute. Nothing exists or has meaning outside of that central meaning and purpose of the universe. Everything in God's creation, except where marred by sin, fits together with harmony and accord.

The foundation for this fundamental fact of existence is the religious confession that everything that exists, except for God himself, has been created by God. All things exist by the will of God. God's law is the orderly way God has designed all of creation to exist in response to his will. There are no contradictions nor unrelated elements within God's will.

This statement affirming unity in creation is a statement of faith, not a scientific statement based on observation or logic. My belief about unity is confirmed by experience and reason, but it is not based on them. I believe that the world is a unity because I am sure the Bible teaches it. Genesis 1 strongly suggests unity, many Bible verses clearly teach that God created all that exists, and the Bible leaves no room to doubt the singleness of God's will and purpose. The New Testament, as in Colossians 1:16,17, shows us that the core meaning of all things is centered in Christ. He is the Truth (John 14:6) and there is no truth apart from him.

I want this confession of my heart to color and give direction to the way I live and the way I do scientific work. I am predisposed to see the world as a fundamental unity, and where observation or logic may at times lead me to think that part of the world lies in fragments and disunity, I trust that the fault is mine and that the problems may be cleared up in the future. I look at the world through glasses of a certain color. Everyone, whether aware of it or not, has a distinctively colored outlook. It is best to be as aware as possible of the color of glasses each of us wears so that we can be alert to how this color may affect the conclusions we draw from our experiences, and even our scientific work.

The scope of the unity of creation is world-wide, excluding no created thing. Embraced in over-arching unity are material things, laws and relationships. The fact of sin, of course, is a challenge to God's perfect unity in creation. Sin is rebellion against God's will, but God's will and law remain intact, and even the rebels themselves must live within the structures of God's law whether they want to or not.

The nature of the unity of the world is fundamentally religious. God has created all things for his own glory (Romans 11:36), and all things are called to respond in a never-ending harmonious chorus of praise to him. Stones, trees, animals and especially people, with the fantastic multi-dimensionality of our lives, are called to respond obediently to God's will. Therein lies the essence of the unity of all things. It is not that some things are subject to God's law and his will, while other things are not.

The unity in creation can be apprehended by us in various ways. We can understand relationships, including logical relationships, from one end of creation to another. There are intimations of certain laws, like equilibrium and economy, which hold for many kinds of situations ranging from subhuman to human relationships. Yet it is my conviction that the universe is not in principle knowable by human rationality, and that rationality is not the key to nor the means of apprehending the unity of creation. Our rationality is limited, is less comprehensive than the universe itself (Isaiah 55:9, I Corinthians 13:9).

The belief that the world has an essential unity does not imply that everything is the same. There is a great diversity in the world. In the Bible we read of the "many-splendored wisdom of God" (Ephesians 3:10), and of the manifold works made in wisdom by God (Psalm 104:24). Only those who fully accept the fact of unity are fully free to accept the fact of diversity. Our drive for simplicity should not trample genuine differences. Reductionism as a search for ontological unity is bound to be a fruitless activity. There are genuinely different kinds of things in the world, and very different aspects of things. They have all been created with interrelationships to the rest of creation. Although we may have a limited understanding of the nature of such interrelationships, in the deepest sense we stand before a mystery. Boundaries between kinds of things indicate the God-given uniqueness of different things. A fascinating aspect of difference among kinds of things is that some laws are valid for different kinds of things but other laws apply only to a given kind of thing. Both humans and rats, for example, are subject to the same numerical laws and laws of gravity, but there are some laws

for rats that do not apply to humans, and vice versa

If there is a basic unity to all reality that is essentially religious, with its meaning centered in Jesus Christ, this leads to the interesting and tricky question as to whether Christians and non-Christians are on the same footing in doing scientific and analytic work. I think the answer needs to be both *yes* and *no*. Unbelievers have the same scientific and analytic gifts as believers, and they can observe the same phenomena, since God's world impinges on all people whether they acknowledge it as his or not. It has become widely (though not universally) accepted that one's worldview is likely to influence one's scientific conclusions at certain levels. Einstein's rationalistic and deterministic worldview led him to work toward a unified field theory and to shy away from quantum mechanics. It is clear that differing worldview and faith commitments are at work in producing different conceptions in the field of psychology. In our day and in previous generations the fact that religious views shaped work in the biological and geological sciences is beyond dispute.

The nature of the unity of the world is fundamentally religious. God has created all things for his own glory, and all things are called to respond in a never-ending harmonious chorus of praise to him.

What is not so clear is that the unbelieving scientist is demonstrably handicapped by not responding in faith to the fundamentally Christ-centered nature of the universe. There are too many ways of being wrong, and for Christians to be wrong, too, to come to that conclusion in general terms. Perhaps Christian and non-Christian scientists are most likely to be in close agreement when the scope of an investigation is narrow rather than comprehensive. On a broader scale, where the experiments and conclusions range on a wider horizon, there are more likely to be differences which arise from different worldviews and different belief-commitments.

This position implies that full objectivity is not possible in scientific work. To be sure, all investigators must be led honestly by what they see in experiment and observation, and be led honestly by the canons of logic. But there is more to the research than description and theory. A Christian and a humanist understand "scientific law" rather differently, the Christian believing it to be an expression of the will of God to be discovered in part, while the humanist may believe that laws are human inventions. A theist and a materialist will differ in some of their understandings of living organisms. Such differences arise from different religious standpoints, and in the case of such differences, I consider a non-Christian to be handicapped. In the social sciences, where a great deal depends on the view one has of the nature of the human person, I should think that Christian research built on a biblical view of man should have an edge. However, a Christian may draw faulty conclusions even from his or her Christian convictions, and may generally lack the competence of one who denies the Christian revelation, so that it cannot be assumed that the findings of a Christian will be superior to those of a non-Christian.

If it be true that there is a unity to all of reality, and that this unity is fundamentally religious because the world was created by God and has its central meaning and coherence in Christ, it follows that a true understanding of the world is intrinsically and inescapably a religious matter. This will be reflected in how people handle scientific knowledge, whether that be expressed subliminally or explicitly, whether one understands the religious implications or not. Therefore the distinctives of the Christian faith will be expressed intrinsically in the basic sciences as well as in applications of science to societal situations.

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OVERVIEW: UNITY IN CREATION

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When I first became interested in writing about unity in creation, I thought that there would be general agreement among Christians on the subject. But since *The Unity in Creation* appeared I have not been so sure of that agreement. Perhaps this symposium brings some questions out into the open.

Cook assumes that unity exists and that unity can be seen in biology and in physics. For him, the Christian position is that ". . . the order in creation speaks of the Creator in a unified voice." Leegwater seems to say that unity is to be accepted on faith and that such unity cannot be confirmed by our scientific work. Manweiler accepts unification only if man himself is part of the unity in view. Murphy presents two unities, one represented by the existence of fundamental structures and interactions, the other by the harmonious interaction of complex entities. He says that these two unities are one, even as the one God exists in three persons. In Neidhardt's somewhat different approach he looks at the same unity as the other authors, but in terms of two-way communications between God and creation and between disciplines. Vander Vennen holds that diversity exists, but that there is still harmony and therefore ultimately there is unity. All men can "do" science, but Christians, who know that all creation is under God, will because of that knowledge sometimes do better science.

Evidently there is agreement that unity in creation is what it is because God is Who He is. Every author—each in his own way—gives special attention to diversity. Concerning the question of reducing this diversity, that is, of explaining one aspect of creation by the laws or structures of another aspect, everyone is at least reluctant to make such a reduction and some categorically deny the possibility of reduction.

My impression is that virtually everyone—others as well as the participants in this symposium—considers the existence of diversity extremely important in any discussion of unity in creation. Some (after the Dutch philosopher Dooyeweerd) speak of modalities of creation; some, of aspects (I find this concept convenient); some, of levels of complexity; some, of disciplines.

These four ways of referring to complexity are not equivalent. In Dooyeweerd, modality has a precise meaning, similar to what non-Dooyeweerdian thinkers less precisely refer to as aspects. The modalities, which when taken together describe created reality, are thought to be arranged hierarchically, with the simplest, the numeric, first, followed by the spatial, through twelve more modalities, ending with the faith modality. Each modality is coherent and is related to the other modalities through the modalities next to it in the scheme. There is significant similarity between this kind of hierarchy and the hierarchy implied in attempts to interpret creation using the level concept. MacKay's ideas on levels—to which Murphy refers—constitute an example of the level approach. For MacKay, a lighted advertising sign can be analyzed on one level in terms of its message and on another level in terms of the physical principles involved in its electric circuits. For the Dooyeweerdian thinker, the linguistic modality must be used in understanding the message of the sign, the economic modality to understand the implications of the advertising, the aesthetic modality to relate the appearance of the sign to its surroundings, several of the first modalities to understand the physics of the circuits, etc. Finally, disciplines are related to modalities, aspects, and levels, but in no case is it a one-to-one relation.

The major points of agreement among the participants are (1) the complete dependence of creation upon God, its Creator; (2) the existence of unity within each aspect; (3) the unity of aspects; (4) the necessity of including man in any discussion of unity (this seems to be a corollary of accepting modalities, aspects, or levels); and (5) the necessity of communal investigation, such as that described by Neidhardt.

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Can we explain to our students the fundamentals of a science so that they will conclude that they learned something they would not have learned from a scientist who is not a Christian?

There are some disagreements among us. No doubt I was not clear enough on some matters in *The Unity in Creation*. Thus, I certainly agree with Cook's goals relative to his first and third points concerning that book. As for the second point, more needs to be said than space allows. I believe that investigation in the different aspects will continue indefinitely and that we should recognize the possibilities of natural boundaries, boundaries we would not be able to cross. But some lines we think are boundaries might not actually be boundaries. Even so, our experience teaches us that some lines look more and more like natural boundaries as time passes. It may be that the Bible teaches that certain natural boundaries exist.

Although Leegwater makes several points about *The Unity in Creation*, this is not the place for me to discuss that book. Instead, I shall summarize briefly what I think the Christian position ought to be. God presents Himself to us as a God of order. He also says that creation speaks to us of Him. We examine creation and find that it is orderly. The results of this examination, that is, the results of our scientific endeavor, should not surprise us, since God told us that what He does is orderly. We do not make God subject to the laws of logic; rather, He is faithful and seen to be a Creator Who is orderly, just as He said.

I strongly disagree with Leegwater if he means in his reference to the second law, etc., that our scientific results do not indicate creation to be ordered. It would be interesting if we could explore in more detail than permitted in these short essays the claims he makes concerning classical mechanics, thermodynamics, classical electromagnetism, quantum mechanics, the first and second laws of thermodynamics, special relativity, and general relativity. Leegwater's idea ". . . that physical entities are individuals of a certain kind," taken from Stafleu, whom he cites, also needs more examination than it has received or can receive here.

What direction might the discussion of unity in creation take at this point? Murphy makes a good case for two unities, and generally the participants seem to accept this idea. Is it not true, however, that our discussion on unity almost always centers on only one of those unities, on how the various aspects are united to each other? Perhaps we discuss too little what it means for unity to exist *within* an aspect. Thus, it is one thing to say that we are beginning to formulate a Christian position on the environmental problems of a certain region of our country and that such formulation is possible just because we can understand the interplay between the biological, chemical, sociological, economic, etc. events which occur in that region. There is a certain kind of unity in this interplay. It is quite another thing to say that we are beginning to formulate a Christian position on the fundamentals of (say) chemistry, fundamentals that include such things as the laws of thermodynamics and the De Broglie relation. Here the interplay of fundamentals constitutes a second kind of unity.

Are we doing enough work on this second kind of unity? For those of us who teach, can we explain to our students the fundamentals of a science so that the students will conclude that they learned something they would not have learned from a scientist who is not a Christian? Or is this unity of fundamentals neutral, having no particular relation to the Christian faith?

Christianity and Functionalism: The Paradox

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Durkheim, Malinowski, and Smith were among the first to use functionalism as applied to society and religion. This perspective is maintained in contemporary sociology by Martin and Nisbet. This study presents a brief review of functional theory and religion. A critique follows on the paradoxical nature of the functional approach as applied to Christian religion and society that explores the following questions: Is it possible for an individual to be a proponent of functionalism and Christianity simultaneously? Can linear models, deterministic evolutionary progress, and the search for functional ideal-types be held to concur with basic Christian doctrine? Has secularization altered basic Christian doctrine? Has secularization altered basic Christian beliefs to conform to functional positivism under the guise of morality? This paper offers a perspective of conflict theory and its basic assumptions as a more appropriate explanation scheme of selected basic Christian doctrine.

Functional Theory and Religion

According to Durkheim, every society distinguishes between the sacred and profane, which are highly crucial elements for the definition of social and nonsocial behavior. Guy Swanson, in studying religion and society, carried Durkheim's argument further, asserting that religion organized around the concept of a single god evolved out of societies with particular organizational difficulties that developed as a society becomes more complex. That is, monotheistic or high-God religions appear when complexities in society exist and there becomes a need for a higher authority to resolve the various conflicts (Cuzzort & King, 1980).

In the Functionalist tradition an individual's religious beliefs, types of doctrine, and specific moral codes are based on a functional-dysfunctional relationship to the society, with society being a valued entity above the wants and needs of the individual. Thus follows the expression that "society is more than its constituent parts." According to Durkheim, what we are trying to find out is not why religion and science are different, but why we continue to separate the world of matter and sense on one hand, and the world of pure and impersonal reason on the other. Science, religion, and society are held to be manifestations of the same collective thought.

As the hidden worship of society, religion provides its members with a common set of ideas that commits them to society. Thus, it serves integrative functions or meets the needs of social solidarity.

Functional analysis examines social phenomena or ideal types in terms of their consequences for the broader society. This perspective has at its basis the idea that society is like an organism that can be studied utilizing the same approach as the physical sciences do when they study the human body, its organs, and functions.

Auguste Comte, with his idea of a positive or scientific analysis, asserted that knowledge of the social world must be based on empirical observations, experimentation and comparison. Turner and Maryanski (1979), in summarizing Comte's position, stated: "We must use our understanding of social laws to assess the contribution of social structures for the social whole—eliminating those that are 'harmful' and creating those that are 'good.'"

Comte's notion of using science to create order, stability, and a homeostasis characterizes functionalism's concern with social integration and equilibrium. Because of the focus on empiricism, functionalism reeks heavily of social engineering based on objective methods and, paradoxically, subjective ideal types that are aimed at control and then prediction under the guise of scientific absolutism.

The Paradoxical Nature of Functionalism

In the spirit of functionalism, system analysis and structural regularities are often purported to be lodged in empirical theory. Are functional theories empirical or do they only pass as such, masking value-laden normative theories?

Functionalism follows from basic underlying assumptions which, upon close examination, reveal anti-Christian values as pertains to man's existence (see Figure 1).

Order Perspective

(1) *Underlying Social Perspective and Value Positions (Ideal)*

(a) *Image of Man and Society*
Society as a natural boundary-maintaining system of action

Transcendent nature of society, an entity *sui generis*, greater than and different from the sum of its parts; lack of transcendence as lack of social control means anomie

Positive attitude toward the maintenance of social institutions

(b) *Human nature*
Homo duplex, man half egoistic (self-nature), half altruistic (socialized nature), ever in need of restraints for the collective good, or

Tabula rasa, man equated with the socialization process, or

Homo damnatus, the division into morally superior and morally inferior men

(c) *Values*
The social good: balance, stability, order, quantitative growth ("moving equilibrium")

(2) *Modes of "Scientific" Analysis*

Natural science model: quest for general and universal laws and repeated patterns gleaned through empirical research

Structural-functional analysis

Multiple causality; theory characterized by high level of abstraction, but empirical studies marked by low level of generalization (separation of theory from application)

Conditions of objectivity: accurate correspondence of concepts to facts; rigid separation of observer and facts observed—passive, receptive theory of knowledge

Analysis begins with culture as major determinant of order and structure and proceeds to personality and social organization

Dominant concepts: ahistorical; high level of generality; holistic; supra-individual concepts; ultimate referent for concepts—system needs considered universally (i.e., the functional prerequisites of any social system) or relativistically (i.e., present maintenance requirements of a particular social system)

(3) *Order Theory of Social Problems and Deviation*

(a) *Standards for the definition of health and pathology*
Health equated with existing values of a postulated society (or a dominant group in the society), ideological definition

(b) *Evaluation of deviant behavior*
Pathological to the functioning of the social system

(c) *Explanation of deviation or a social problem*
A problem of anomie in adequate control over competing groups in the social system; disequilibrium in the existing society

(d) *Implied ameliorative action*
Extension of social control (further and more efficient institutionalization of social system values); adjustment of individuals to system needs; working within the system; the administrative solution

(4) *Order Theory as Socially Situated Vocabulary*

Dominant groups: the establishment and administrators of the establishment

Contemporary representatives: Parsonian and Mertonian approach to social problems as a liberal variant of order models; politically conservative approaches

Source: John Horton, "Order and Conflict Theories of Social Problems as competing Ideologies," *American Journal of Sociology*, Vol. 71 (May, 1966), pp. 701–713.

Figure 1

In terms of a functionalist view of man and society, society transcends the individual and is greater than its constituent parts. Man as individual is negated by *Homo Damnatus* the division into morally superior and morally inferior persons.

That being the case, functionalism values the social good, legal-rational authority and order, lending itself to a system's maintenance position of elitism.

Functionalism's modes of scientific analysis are ahistorical in context following a natural science model that supposes a rigid separation between observer and facts observed. This analysis begins with culture as a major determinant of order and structure and proceeds to personality and social organization. The more efficient institutionalization of the social system and the adjustment of individuals to system needs as defined by administrators are for functionalism the means of improving society (Horton, 1966).

In view of the foregoing assumptions of functionalism,

assuming man as having rational abilities, can basic Christian beliefs be held to concur with these premises?

According to the record presented in the New Testament, Christ himself was an activist regularly denouncing the Pharisees, Saducees, and government for their position of moral superiority towards others (Acts 4:1–3, Mark 12:18–27, Matt.:23, Mark:7, Luke:11, New Testament, King James Version; see also the Concise Bible Dictionary). The Pharisees sought to reduce religion to the observance of a multiplicity of ceremonial rules. The Saducees consisted of old high-priestly families. They were the Jewish aristocracy maintaining religion to be only the letter of the written law. These groups assumed, as functionalists, that man was ever in need of restraints for the collective good, bestowing on themselves a morally superior position. Christian religion focuses on the idea of a "Christ-like life;" that is, it uses the historical accounts of Christ as an example for persons to follow. Christianity is anything but ahistorical in content, as it emphasizes adherence to ancient texts even now. It seems a rational contradiction to maintain order perspective assumptions and Christian assumptions simultaneously. Christianity emphasizes the individuality of each person in relation to a metaphysical being; functionalism emphasizes empiricism, through natural science models.

Linear models, deterministic evolutionary progress, and the search for functional ideal types promote supposed objectified causality. If individuals are subjective as well as objective by nature, then such models negate spiritual-metaphysical, self-will characteristics, leaving man in a robotic existence.

Secularization of religion according to various theorists has altered basic Christian beliefs into alignment with bureaucracies, political states, maintaining the role once again of modern day Pharisees and Saducees (Lane, 1974; Martin, 1978; Spann, 1950). For example, there is a continuum of pluralism leading to nonpluralism, running from Protestant to Catholicism to Orthodoxy. The following is a representation of this continuum:

Protestantism–Catholicism–Orthodoxy
Pluralism←——————→*Nonpluralism*

Orthodox religions of today are often found to be the mouthpiece of their governments, exhibiting strict hierarchies and bureaucratic control. Catholicism, because of its size, is on the one hand opposing political rule but on the other hand insuring the control of its own. Protestantism at least exhibits some aspects of pluralism. It is the view of many secular theorists (Barry, 1969; Johnson, 1964; Lane, 1974; Martin, 1978; Spann, 1950) that as all religion shifts to secularity, the once fought-for plurality will show no pluralism at all but, in fact, reciprocate with the political states for functional systems maintenance. Thus, the guise of Christian pluralism exists while orthodoxy actually increases. Finally, Christianity alters its basic concepts and assumptions, forming a new alignment with the domineering scientific-empirical system's maintenance model negating the active role of man.

As society progressed away from a joint effort of church and state, it took on certain characteristics from the resultant secularity. None of the basic concerns of man's spirit (subjective reality) carried more than an attenuated relationship to religion. Indeed, a unified religious spirit had lost its intensity. The objective habits of science, the routine character of industry, the mechanistic influence of the machine have all increasingly encouraged the secularization of the West. Stemming from both the Hebraic realism of the Old Testament and the Greek development of science, present day culture resulted from certain determining attitudes initiated centuries before (Miller, 1963). Nature is no longer religious but is classified and dissected. Work is no longer surrounded by ritualism with religious connotations. The dance, song, and community spirit of work have been deleted, leaving only drudgery in sight.

Secularization, according to Martin (1978), had a corrosive impact on religion, consisting of two phases:

> The first phase left all kinds of human-scale structures standing: the family firm, self-employment, the small farm, the small office, the intimate college, and pockets of community, either rural organized around the church or industrial organized around the kinship network. All these were congruent with a family model of society where individuals mattered in relation to a constraining structure which could offer meaning.

With this phase came voluntary associations, life organized by national boundaries, and a continuance of homogeneous feelings of brotherhood. The second phase of secularization had at its basis a breakdown of traditional authority with movement into legal rational structures (Weber, 1922, pp. 1–12). As a result of this second phase:

> An attack was precisely made on human scale structures: the small home, the medium-sized school, the bounded town, the family firm, and replaced them by the structures of large-scale bureaucratic rationality. It cut down the urge to limited, varied, voluntary association and replaced it by a generalized empathy through mass communication, which easily degenerated into apathy. And the state itself again summed and reflected all these successive, overlapping fragmentations by exhibiting a corrosion of the sense of national identity (Martin, 1978, p. 92).

The second phase of secularization as described in the foregoing statement has three overall aspects that tend to be exhibited by society. They are the lack of unity (decreased emphasis on generalism and a move toward specialization), no superstition (the negation of unseen subjectivity), and alienation (existential definition loss).

According to Miller (1963), the lack of unity resulted in the consciousness of man undergoing a radical differentiation by which the various component parts of his psyche "broke loose" and moved into an independent freedom. The aesthetic and political sense was no longer dominated by religious themes, and reason developed science and repudiated any authority but truth considered objectively. Each area stood in diametric opposition to the religious unity that had traditionally held them in its bounds. Church and state were set apart. Due to the development of such trends, presently there is a great difficulty in identifying religious factors in government and science. Even religion itself is being studied from an objectified position. The stress of objectification away from subjectification does not allow for a

synthesis of the bipolar nature of man. Secularization has developed so as to break down holistic persons, specializing them away from a total person synthesis.

The lack of superstition and mystery is increasingly being augmented by further developments in science and technology. We have learned a degree of honesty, how to observe objectively, how to describe more accurately. This acts as a check on fears, exaggerations, and projections. Indeed, this is a positive aspect of secular progress. However, there is negative repercussion from a swing too far in this area. We settle for epistemological constructs that are dependable and repetitive, and let go of everything that cannot be measured, analyzed, and predicted. Science pushes the unmeasurable away as unknown, and the sacred-religious is affected by reductions in worship as being trite. The negativism of a metaphysics thus is a dimension of secularity.

The third element of secularity is found in the alienation of man. It was Hegel who was the first to use the word alienation to describe an abnormal condition induced by cultural changes and assuming the proportions of a collective neurosis.

Secularization, then, assuredly has altered basic Christian beliefs to conform to functional positivism under the guise of morality.

Underlying Assumptions of the Conflict Perspective

Conflict theory views the order perspective as a strategy of a ruling group to insure social control. Society is a struggle between groups with differing goals. Conflict theory holds that men are society and society is the extension of man. Unlike the functionalist perspective, man as individual is given an important place in the concept of society, not put into a cybernetic hierarchy of control (Turner and Maryanski, 1979). The conflict perspective holds man's nature as *Homo laborans*, existential, being the active creator of himself and society through pragmatic and individual social action.

The values equated with the position of man as active include qualitative growth, action, change. This perspective views man as basically good, never differentiating men into morally superior and morally inferior beings.

Because conflict theory has at its basis a historical model of scientific investigation, it allows for understanding (*verstehen*) through changing events. Change is desirable and is accounted for by the historical model inclusive of man as active creator. Objectivity of epistemological structures is discussed in the context of the observer's subjectivity. Alienation occurs not from the social system as defined by dominant groups, but the splitting of man from his universal nature or desired state of affairs (see Figure 2) (Horton, 1966).

Society to be improved must decrease social control, changing existing patterns of interaction, institutions, and domination by legal-rational administration in view of a conflict perspective.

The conflict theorist invariably asks of the legitimacy of existing structures, practices, and values maintaining an active role, instead of accepting the social systems as a standard of health.

What then of the conflict perspective and Christianity in view of the underlying assumptions associated with both?

Because the assumptions of the conflict perspective view man as active creator of himself and society, individuals remain attached to their subjectivity, allowing for a positive attitude towards change. Indeed, Christian religion sees persons as important to themselves as well as to others. Does not Christian religion focus on the personal development of each person?

Unlike functionalism, the conflict perspective does not assume morally superior and morally inferior men. Christian religion also denounces such notions, but as we looked at secularization, we saw that much of the religion has been altered for elitist goals (Matt. 5, 6, 7, and Luke 13:15, New Testament, King James Version).

In terms of social problems and deviation, the conflict perspective sees a problem of illegitimate social control and exploitation. Was this not also the case in the biblical history of confuting the Saducees, Pharisees, scribes, and government (Matt. 22:23–33, 41–46, 23:1–39; Mark 12; Luke 20, New Testament)?

It seems, then, upon careful examination of the conflict perspectives, assumptions are more aligned with basic Christian doctrine, particularly as it pertains to society, individuals, ruling elites, and the validity of a historical perspective.

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Conflict Perspective

(1) *Underlying Social Perspective and Value Positions (Ideal)*

Society as a contested struggle between groups with opposed aims and perspectives

Immanent conception of society and the social relationship; men are society; society is the extension of man, the indwelling of man; the transcendence of society is tantamount to the alienation of man from his own social nature

Positive attitude toward change

Homo laborans existential man, the active creator of himself and society through practical and autonomous social action

Freedom as autonomy, change, action, qualitative growth

(2) *Modes of "Scientific" Analysis*

Historical model: quest for understanding (*Verstehen*) through historical analysis of unique and changing events; possible use of ideal type of generalization based on historically specific patterns

Unicausality; high or low level of theoretical generalization; union of theory and practice in social research and social action

Utility in terms of observer's interests; objectivity discussed in the context of subjectivity—activistic theory of knowledge

Analysis begins with organization of social activities or with growth and maintenance needs of man and proceeds to culture

Historical, dynamic; low level of generality and high level of historical specificity; ultimate referent for concepts—human needs considered universally (i.e., man's species nature) or relativistically (demands of particular contenders for power); referent often the future or an unrealized state of affairs

(3) *Conflict Theory of Social Problems and Deviation*

(a) *Standards for the definition of health and pathology*
Health equated with unrealized standards (the aspirations of subordinate but rising groups), utopian definition

(b) *Evaluation of deviant behavior*
Possibly progressive to the necessary transformation of existing relationships

(c) *Explanation of deviation or a Social Problem*
A problem of self-alienation, being thwarted in the realization of individual and group goals; a problem of illegitimate social control and exploitation

Rupture of social control; radical transformation of existing patterns of interaction; revolutionary change of the social system

(4) *Conflict Theory as Socially Situated Vocabulary*

Subordinate groups aspiring for greater power

C. W. Mills, new left (SNCC, SDS, etc.) approaches and old left (socialistic and Communistic)

Source: John Horton, "Order and Conflict Theories of Social Problems as Competing Ideologies," *American Journal of Sociology*, Vol. 17 (May, 1966), pp. 701–713.

Figure 2

Conclusion

It must be acknowledged that the order assumptions and conflict assumptions, while they remain in a polemic position, carry with them deficiencies. They both maintain ideal-typic positions that are immediately suspect. Probably the most reasonable position to take is to join both views as a synthesis. However, functionalism negates man as a Christian, except to maintain that religion is functional according to the imputed reality of the scientist.

Assuming that man has rational abilities, the author finds it difficult for persons to profess functionalism and Christianity simultaneously, unless the basic Christian religion has been so altered by secularization that religious institutions have themselves accepted the functional perspective. If so, what remains is a pseudo-Christianity and a re-evaluation of religious pluralism is in order, thereby retaining man as an individual, spiritual, subjective, and the very essence of society.

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Community Mental Health: An Affirmation by Theology

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Community mental health is concerned with the promotion of mental health and the prevention of mental illness where emphasis is laid on practice within the community. Its target of intervention focuses upon a defined population or community as opposed to individual patients. This approach is based upon the importance of systems of services provided by a community which opts for the continuity of care of services within the community and the provision of indirect services such as consultation and education.

The present discussion is concerned with the affirmation of the community mental health paradigm by Christian theology. Both theology and community mental health are seen as being derived from a single world view which is exemplified by Thomas Oden's "covenant ontology" and Gary Collins' premise of God as the source of all truth. From this, the basic assumptions of positive mental health, prevention of mental disorders, and the social-environmental influences in the community mental health system are supported by theology. A topical discussion of non-professionals, paraprofessionals, and therapeutic considerations is undertaken with implications for future direction in this field.

Community mental health and community psychology are intimately related disciplines that offer the field of psychology an entirely new approach to the health and welfare of individuals in modern society. The two disciplines remain distinct basically in terms of their target of intervention (Iscoe and Spielberger, 1970). Community mental health focuses primarily upon innovative interventions aimed at the individual whereas community psychology is concerned with interventions geared toward the social systems that impinge upon the individual. The two fields represent a "third mental health movement" (Hobbs, 1964) that proclaims a radically new approach to human functioning and as a result its impact upon the professional psychological community is widespread.

Does this third force in psychology represent a legitimate and viable alternative to traditional modes of service delivery, or is it another passing fad . . . as Dunham (1965) has put it, another "therapeutic bandwagon?" The answer formulates the central theme for this discussion: When viewed from a theological perspective, the fields of community mental health and community psychology do represent disciplines that possess great potential. Theology may speak directly to these fields by sanctioning their existence and growth as they apply themselves to the treatment of the human condition. This discussion focuses upon the area of community mental health, although it overlaps with community psychology, community psychiatry, and social psychiatry.

A Model of Integration

Levels of Inquiry

For one to postulate an integration between theology and community mental health, an examination of each discipline's ontology is warranted. Laudan (1977) provides a model within which this integration may be conceptualized and thereby provides a basis from which a *common ontology* may be elucidated. Laudan's model is illustrated in Figure 1 in which there are three levels of inquiry: the world view, the research tradition level, and the theory level.

Research tradition level. In his model, the research tradition is defined as

> A set of general assumptions about the entities and processes in a domain of study, and about the appropriate methods to be used for investigating the problems and constructing the theories in that domain. (p.81)

Thus, each research tradition embodies an ontology for the entities within the research tradition and also provides methods of inquiry into those entities. In essence, as Laudan has stated, "a research tradition is thus a set of ontological and methodological 'do's' and 'don'ts'" (p.80).

Theory level. At a lower level stemming from the research traditions are the theories. Theories speak about specific and testable laws about nature. Thus, the theory is a necessary and vital link between empirical observations and the ontologies of the research tradition.

The present discussion focuses on Laudan's model in the following manner. Research tradition I represents the discipline of theology. To illustrate, particular theories that may generate from this research tradition are: Theory A—Calvinism; Theory B—Barthian Theology. Research tradition II represents the field of community mental health. Some theories that grow out of this research tradition are: Theory C—Community Consultation; Theory D—Crisis Theory.

World view. At the highest level of inquiry in Laudan's model is the world view that entails particular research traditions. It is at this level that an ontology is defined from which the research traditions of theology and community mental health are commonly derived. If these two disciplines have a *common ontology*, then they share common elements. Laudan has stated that certain elements are more central to the research tradition and in turn become characteristic of that research tradition. The research traditions of theology and community mental health share common core elements derived from a common ontology. Although both research traditions embody common core elements, there are elements (e.g. methodologies) that are unique to each discipline. However, the commonality of the elements characteristic to each research tradition provides a foundation for the affirmation of community mental health by theology. The next step, then, is to elucidate the common ontology (i.e. world view) that provides the basis for relating theology and community mental health.

Covenant Ontology as a World View

The common ontology alluded to earlier is best described by Oden (1978) as a *covenant ontology:*

> 'Ontology' means the study of being, or inquiry into the nature and modes of being. 'Covenant' means the relation that God has chosen and established with the world and man, as seen prototypically in the history of the people of Israel and therefore representatively with all creation, embracing all being, the essential terms of which are: 'They shall be my people, and I will be their God' (Jer.32:38). Covenant ontology is therefore a study of being which sees being as existing in covenant and the covenant of God as the center and circumference of being. (p.78)

The world view is that all being is in covenant relationship with God who is also the core and parameter of creation. It follows that any derivative of being must also be rooted in the covenant ontology. Theology is rooted in a covenant ontology in the same way that community mental health is rooted in a covenant ontology . . . *they derive from the same source.* Herein lies the basis for the affirmation of community mental health by theology. Each discipline embodies God's unconditional love for his people. Indeed, the covenant of grace was given to all.

> I will establish my covenant as an everlasting covenant between me and you and your descendants after you for the generations to come, to be your God and the God of your descendants after you. The whole land of Canaan, where you are now an alien, I will give as an everlasting possession to you and your descendants after you; and I will be their God. (Genesis 17:7-8)

The characteristic that distinguishes, for example, Christian fellowship (i.e. the dynamics of a fellowship community) and the community mental health notion of "community functions" (Klein, 1968) is that the former explicitly proclaims God as the source of its existence and functioning whereas the latter implicitly embodies God's design. There is an implicit function working within the community mental health domain that can be made explicit in the theological domain. This is Oden's assumption of the covenant ontology, both implicitly and explicitly proclaimed. The separation of the two research traditions stems from the idea that community mental health is not conscious of its ontological presupposition whereas theology consciously proclaims it. This is not to say that community mental health was born out of the ontological presupposition of God's covenant of grace (though it embraces grace implicitly). In fact, community mental health came about because of a number of dissatisfactions and deficits in traditional mental health service delivery systems (Korchin, 1976). The point to be made here is that a *post hoc* analysis of the system of community mental health reveals a covenant ontology.

One Unifying Truth of God as a World View

Collins (1977) has approached the thesis of a covenant ontology as embodied through *special revelation* and *general revelation*. Special revelation refers to the explicit proclamation of the kerygma, the revealed Word of God, the Logos (John 1:1,2,14). Collins explains that the proclamation is revealed through "the Bible, a book that Christians believe to be God's written word of special revelation to man" (pp.121-122). In terms of general revelation, Collins describes it as the following:

> General revelation, sometimes called natural revelation, refers to the truths that God has revealed himself through nature, science, or history; and which man can know by observation, empirical investigation, logical deduction, intuition, feeling, the study of tradition, or any other technique apart from reading the Bible. (p.121)

Upholding special revelation and general revelation is an ontological presupposition similar to Oden's world view of covenant ontology. Collins describes his premise in terms of its implication for psychotherapy:

> Let us consider the suggestion that, in the future, psychology could be more productive and less in a dilemma if it were built on the major premise that God exists and is the source of all truth. This assumption could serve as a starting point from which data could be collected, systems could be built, therapy could be developed, and principles of living could be derived. (p.118)

There is only one source of truth and that is God's truth. This theme is central to Christian theology (Holmes, 1977). This same truth speaks to theology as well as community mental health. We see God's truth within the community mental health framework in the form of general revelation ("implicitly" in Oden's rubric).

The affirmation of community mental health by theology is rooted in the assumption of God as the source of all truth. Theology endorses community mental health in that special revelation (i.e. the Word of God) can describe and set the parameters within which general revelation may operate. For example, in describing the commandment of love, and specifically the description of love as being kind (I Corinthians 13:4), Smedes (1978) has stated that love is a "readiness to enhance the life of another person . . . It is the power to move close to another person in order to heal" (p.15). It means that love would not incarcerate a victim of mental distress to custodial care but would rather work toward the resolving of the person's distress through a community of care. The ontology of God's truth does not allow for the inhumane treatment of people. Theology is *for* that type of treatment that upholds the humanity of man as is the case in the field of community mental health.

If there is a covenant ontology, that all truth comes from God, then theology, by the act of affirmation justifies community mental health. However, in what way does theology affirm community mental health?

The Basic Underlying Assumptions of Community Mental Health

Mann (1978) proposes a "mental health model" of community psychology that is rooted in the community mental health center movement. The purpose of this model is "to address the question of the impact of mental health services on mental health problems" (p.79). The nature of this type of service delivery is thought to have three basic assumptions: (1) emphasis on prevention, (2) focus on the concept of positive mental health, and (3) the social-environmental context as a highly influential source in the etiology of mental disorder. *Theology speaks to all three assumptions.*

Prevention and Positive Mental Health

The first two assumptions may be taken together in that a thrust for positive mental health entails the implementation of preventive measures. Both assumptions assume a competency model of mental health as opposed to a deficit model.

The concept of positive mental health has grown out of the dissatisfactions with the medical model. This model purports that abnormal individual behavior can be attributed to some underlying cause or disease. The focus is on an intrinsic deficit or disorder which leads to interventions that involve treatment of a sick person to remove or alter the pathology that resides within the individual. Szasz (1974) clearly articulates the argument that there is no such entity as mental

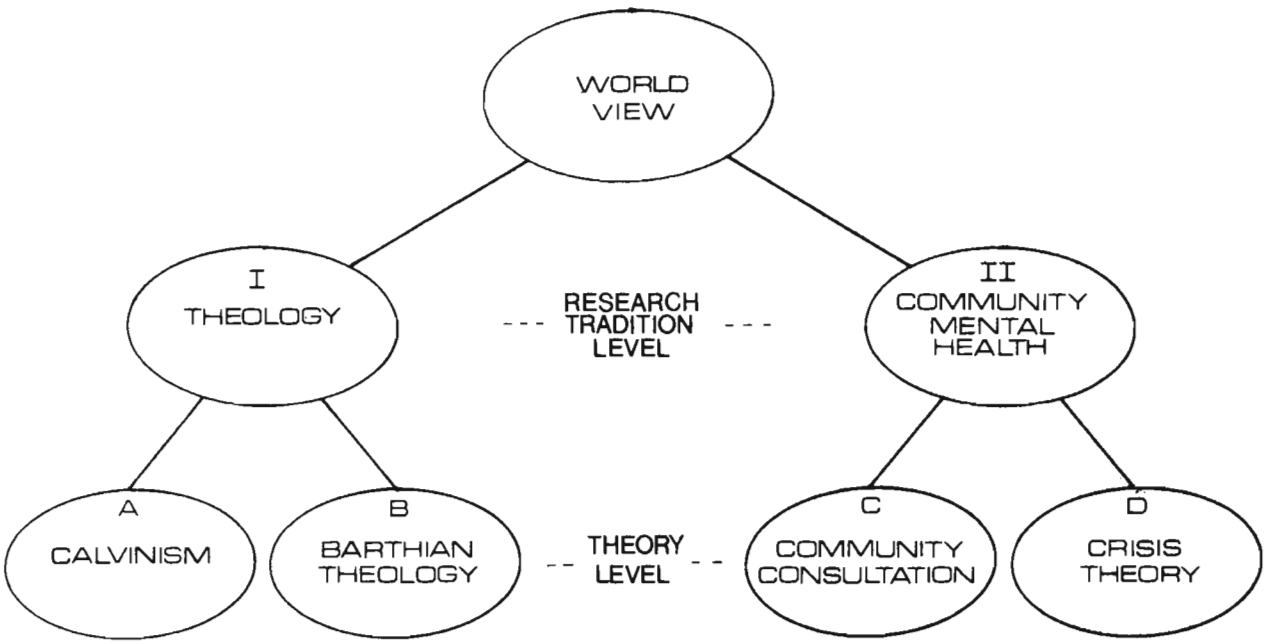

Figure 1. An illustration of Laudan's model with the research traditions and theories defined.

illness, rather, it is a myth. Mann states that a new definition of mental health is needed in order for efforts in prevention to move forward. He says that the outmoded definition of mental health as "the absense of mental illness" is both tautological and unproductive (1978, p.84).

Theology upholds community mental health's efforts in the prevention of mental disorder and the changing of the concepts of mental illness toward positive mental health. The reasons for such an affirmation may be found within the doctrine of the image of God in man and the doctrine of the Incarnation.

within the community mental health framework is to support, nurture, and build upon those areas within the individual that manifest God's image. Here again, the emphasis upon the strengths and potentials of the individual is paramount to a concept of positive mental health.

This part of the discussion on positive mental health is incomplete without mention of the Incarnation, for it is in Jesus Christ that we see who we are meant to be. The impact of his ministry on the history of mankind was that "he aroused men to realize their human predicament, and in his life he attracted men to a fulfillment of their humanity"

Theology affirms the importance of the social-environmental influences through the dynamic of Christian fellowship. It is essential for individuals to know they belong to a community and have a purpose in it.

The Apostle Paul wrote:

> Stir up the gift of God, which is in thee . . . For God hath not given us the spirit of fear, but of power, and of love, and of a sound mind. (II Timothy 1:6–7)

God has called His people to gather their resources to a life of courage and not of despair . . . to utilize their God-given potentials not in timidity, but in power and in love. Indeed there is an inestimable worth in each person. This led the Psalmist to write astoundingly:

> When I consider your heavens, the work of your fingers, the moon and the stars, which you have set in place, what is man that you are mindful of him, the son of man that you care for him? You made him a little lower than the heavenly beings and crowned him with glory and honor. (Psalms 8:3–5)

The question of "what is man?" has been a difficult one to answer both theologically and psychologically. The question is also central to the present discussion in that in the *imago Dei* some direction may be found as to theology's affirmation of positive mental health.

The Genesis account makes explicit the *imago Dei:* "So God created man in his own image, in the image of God he created him" (Genesis 1:27). Only human beings are made in God's image. They are distinct from the rest of living creation in that they alone may have a relationship with the Divine Being. Carey (1977) has stated that the stress of this passage is not on physical likeness, but that human beings transcend the earth by belonging to God. Thus, they must have a great deal of worth to be created by God and belong to Him. The *imago Dei* suggests that a human person is in a warm and intimate relationship with God. Thus, we see human beings as competent and valuable . . . descriptions that are indicative of a positive, optimistic view for mental health.

Theology affirms the concept of positive mental health for reasons that persons were created in God's image . . . an image that has an inalienable worth. The task that is inherent (Carey, 1977, p.67). We see that human beings have a fallen nature, that they are alienated from God (Mark 2:8). Despite this fallen nature, Jesus reveals in his life what human beings are meant to be (Hebrews 4:15).

Mental illness is a complex problem with numerous determining factors. To reduce the etiology of mental illness to the human fallen nature overlooks a vast amount of insight and behavior that might enlighten any attempts at intervention. Community mental health opts for interventions that build upon the individual's potentials (those potentials being grounded in the *imago Dei*). Jahoda (1958) characterizes positive mental health as autonomy, integration, growth and self-actualization, positive attitudes toward the self, perception of reality, and environmental mastery. Phillips (1967) states that the development of competence or coping skills are also necessary for the concept of positive mental health. This same thought is in the Apostle Paul's writings:

> Not that I have obtained all this . . . but I press on to take hold of that for which Christ Jesus took hold of me. Brothers, I do not consider myself yet to have taken hold of it. But one thing I do: Forgetting what is behind and straining toward what is ahead, I press on toward the goal to win the prize for which God has called me heavenward in Christ Jesus. (Philippians 3:12–14)

By moving *toward* a positive approach in mental health, (especially in prevention) and out of the medical model, more of the human potential may be realized, or at least elicited, that individuals may, in the words of Søren Kierkegaard, "be that self which one truly is" (1941, p.29).

Social and Environmental Context

Community mental health utilizes methods of intervention within social systems. Moving away from the medical model entails identifying the sources of mental disorder within the immediate environment that surrounds an individual and intervening in those social systems.

The impact of one's social-environmental context is highly

influential upon one's mental health. Social support networks affect individuals when they are recognized or defined as ill and whether they can cope with stresses of community life (Kaplan, 1977). Tolsdorf (1976) suggests that successful social and community adjustment depends much upon the support given to an individual by family and friends. By observing beyond the individual in distress, a more comprehensive approach to the alleviation of mental disorder can be made possible.

Theology upholds this third assumption of community psychology. We see from Jesus' ministry that he was not restricted simply to minister to the needs of people in the synagogue nor did he passively wait for people to come to his dwelling place for healing. Instead, Jesus went *into* the community to provide healing to many sick people. In Mark 1:21–34 we find Jesus healing people in three contexts: in the synagogue, in the home of Simon and Andrew, and in the streets. In Matthew 4:23–24 Jesus went throughout Galilee teaching, preaching and healing. When the disciples were sent into the mission field Jesus gave them these instructions: "Do not go among the Gentiles or enter any town of the Samaritans. *Go* rather *to* the lost sheep of Israel" (Matthew 10:5–6). They were not to sit and wait for the lost sheep to find their way home.

One of the major distinctions of mental health workers of the community mental health variety is that they work *in* the community. They become both participants and observers of the community in which they work. The mental health worker must avoid retreating into the safety of the clinical office when it is evident that action within the community is preponderant. Taking Jesus' ministry as a model we see that community mental health serves as an example of how his ministry can be applied to the amelioration of mental distress.

Another major contention of the assumption of the social-environmental influence is that the individual cannot be viewed alone but must be seen in relation to the surrounding environment. The degree to which a person is isolated is a function of the person's relationship to the community, and hence, is central to an individual's wholeness. By isolating the person away from the community, the person loses a sense of wholeness. Klein (1968) reflects this idea:

> They suffer from the agonizing anonymity of the perpetual stranger. Or they are oppressed by the sense of worthlessness and futility arising from the inability to influence the course of events. (p. 161)

Theology affirms the importance of the social-environmental influences through the dynamic of Christian fellowship (I Corinthians 12:12). It is essential for individuals to know they belong to a community and have a purpose in it. Each person (believer or non-believer) is given a gift that can be fulfilled within the community (I Corinthians 12:7). It is the natural endowment for the individual to belong to the community not only because the person has a contribution to make, but that it is part of God's design for creation: "But in fact God has arranged the parts in the body, everyone of them, just as he wanted them to be" (I Corinthians 12:8). There is some inherent good in the existence of a unified community: "How good and pleasant it is when brothers live together in unity" (Psalm 133:1). Thus far community in this context means the fellowship of believers. However, to affirm the community importance in the secular realm, a model of Christian fellowship will provide a basis from which community mental health may borrow. The opinion of this author is that community mental health is already moving in the direction of embodying principles of Christian fellowship by exhorting the importance of community to the individual in distress.

In his book, *Life Together,* Bonhoeffer (1954) describes various ministries within the Christian fellowship. He notes a basic premise that is essential for an understanding of the community dynamic:

> In a Christian community everything depends upon whether each individual is an indispensable link in a chain . . . It will be well, therefore, if every member receives a definite task to perform for the community, that he may know in hour of doubt that he, too, is not useless and unusable. (p. 94)

The community is an interdependent system. It means also that the care of its individual members is vitally important.

The *ministry of helpfulness* (pp. 99–100) has its implications for the *delivery of mental health services.* Bonhoeffer describes this as being available to God's will for doing His service. Christians are not to filter out those tasks that may seem unattractive. This is juxtaposed with the need to deliver services to the poor as well as to members of the often neglected minority groups (Sue, 1977). Out of this ministry of

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helpfulness it may even be possible to negate much of the stigma attached (see Sarbin and Mancuso, 1970) to persons who suffer from emotional distress.

Bonhoeffer notes the importance of the *ministry of bearing* (pp. 100–103) in the community. This entails being with another person, to bear that person's burden with them. Within the social context, this means that a network of support must be available for a person in need to turn to for assistance. This ministry has its implications for *crisis intervention* techniques, a method now employed as part of community mental health centers and services. The twofold goals of crisis intervention are, according to Mann (1978) first to mobilize social forces (e.g. family and friends) and secondly to mobilize cognitive resources (e.g. creating viable alternatives). The support system of individuals during times of stress and crisis is vitally important. Here, the Christian principle of a supportive fellowship is substantiated in the community mental health approach.

Another implication of the ministry of bearing comes forth in the area of *mental health consultation*. The Old Testament writer illustrates this dynamic:

> Two are better than one, because they have a good return for their work: If one falls down, his friend can help him up. But pity the man who falls and has no one to help him up! (Ecclesiastes 4:9–10)

The social-environmental influences also have an impact on the mental health worker. This individual can also be aided by the bearing of the burden by a significant other. This principle has its counterpart in community mental health through Gerald Caplan's (1964) system of mental health consultation . . . in particular the "counsultee-centered case consultation." Here, the consultee is given advice and support concerning a particular problem by another professional. The mental health worker, too, is a part of the community, is subject to the stresses of life and may at times need timely support, care, and advice. Here is an example of the interdependency among the members in the community; each member represents a part of the larger social system. Indeed, the Christian model of ministry of bearing affirms those principles and techniques in community mental health which reflect that ministry.

The basic presuppositions of the community mental health orientation have been considered in light of theological perspectives. Now we must ask: Does theology affirm some changes that community mental health subscribes to that are considered to touch on some key issues in psychology today?

Nonprofessionals and Paraprofessionals

One of the major shifts in the community mental health field has been in the area of mental health service delivery, more specifically, the shift from the professional agent to the nonprofessional and the paraprofessional. This has been born out of the serious gap between manpower resources and public needs. Iscoe (1971) suggests that an increase in manpower is essential to increase the effectiveness of the therapeutic agency. This increase in manpower focuses upon the non-professional in particular, not on the professional only, and it touches at the very core of psychology in that effective psychotherapy can be done by a non-professional as well as the professional. Theology affirms this notion.

A strong attack on professional elitism in the therapeutic agency has been made by Oden (1974). His claim is that

> Professional elitism, whether in the clergy or in therapeutic circles, tends to assume that ordinary people cannot be therapeutic agents. (p. 9)

Research supports Oden's stance. Studies have shown that people turn to natural caregivers (who are also more available during a crisis) more often than to professionals in times of stress and emotional troubles (e.g. Lieberman, 1969). In a classic study by Rioch *et al.* (1963), it was found that lay training of specially selected persons could be as effective as those trained in a regular graduate school. The lay mental health counselor has also been found to facilitate significant improvement on hospitalized patient behavior (Carkhuff and Truax, 1965). What seems to be central to any effective therapy, regardless of orientation, is what has come to be known as the "therapeutic triad": congruence, empathy, and unconditional positive regard (Rogers, 1957). These three characteristics need not be confined to or possessed solely by professionals.

The biblical account strongly supports the furthering and equipping of the laity. Jesus and his disciples were nonprofessionals (Acts 4:13) except for Luke, who was a doctor. Much of the early Christian witness was done through the ministry of the laity (Acts 8:1,4; 11:19–21). Jesus trained his disciples through instruction, modeling and by experience (e.g. Matthew 5:1–2; Luke 24:27; Acts 1:2). Though Jesus chose ordinary people to further his kingdom, he trained them carefully, nurturing them to the point that they could go out on their own into the mission field. Parallel to this in the field of community mental health, the training of lay therapeutic resources has taken place for the task of bridging the gap between the supply and demand of mental health services. Theology affirms those aspects of community mental health that support the use of the laity as therapeutic resources.

Therapeutic Considerations

One of the primary antecedents to the onset of the community mental health movement was the dissatisfaction with psychotherapy. Eysenck's (1952) often cited criticism that psychotherapy is no more effective than the passage of time and placebos stands as one of the classical statements against psychotherapy. Other research however, suggests a more positive outcome for the effectiveness of therapy (Bergin, 1963). The implication of unsuccessful psychotherapy has led workers in the community mental health field to move on to different roles (e.g. community psychologists, social action psychologists, social engineers, as suggested by Scribner, 1968). Must traditional psychotherapy be abandoned? The Christian doctrine of man may shed light upon the *preservation* of the traditional psychotherapeutic agency, however with certain ramifications.

Schmieding (1958) has stated that "man is not now a soul then again a body. Man is a single being, a self, an I, or a you" (p. 318). The implication is that man is a single entity; man is whole . . . not in duality (body and soul) or trichotomy (body, soul, and spirit). Berkouwer (1962) has said that "we should remember that it is the whole man who is restored and saved"

(p. 229). Therefore, when viewing through the psychotherapeutic agency, we see man as unity and as whole.

Because man is whole, a unity, an equally complementary treatment must be aimed toward the whole man. This is not to say that psychology must formulate a new quasi-therapeutic orientation as a means of therapy. Rather, an *eclectic* approach to community mental health may be more useful in the light of God's truth. An examination of the biblical text finds Jesus using a variety of techniques. The doctrine of the whole man, and Jesus' example of the number of ways he dealt with the whole man, is evidence for an eclectic approach to therapy (e.g. Garfield, 1980) and service delivery. This eclectic approach has become a reality within the community mental health center in terms of the types of services available. They are: inpatient care, outpatient care, emergency services, partial hospitalization, consultation, education, diagnostic services, training, and research and evaluation. The comprehensive approach to mental health in the community mental health center does reflect the need to minister to the whole man.

The inequality of treatment rendered to individuals in distress has become an increasingly important issue. Clients receive differential treatment in therapy depending upon demographic factors such as age, race, sex, and socio-economic factors (Overall and Aronson, 1962). The YAVIS Syndrome has been suggested by Schofield (1964) as a characterization of the desirable client. He found that therapists prefer Young, Attractive, Verbal, Intelligent, and Successful individuals for clients. Goldstein and Simonson (1971) suggest that there is a greater need for research and intervention that is focused on the HOUND patient: the Homely, Old, Unattractive, Nonverbal, and Dumb client. It seems as if a person's natural endowment determines the type of care that person receives. Jesus addressed this issue:

> For I was hungry and you gave me something to eat, I was thirsty and you gave me something to drink, I was a stranger, and you invited me in . . . I tell you the truth, whatever you did for one of the least of these brothers of mine, you did for me. (Matthew 25:35–40)

Jesus cared for the sick, the lepers and the blind. *Jesus ministry is a model for human response.* Humankind's response to human need is, in actuality, a response to the Divine Being Himself. Community mental health is in a sense a human response to the needs of the individual by going into the community, meeting distressed people where they are . . . not in a selective manner as is characterized by the private practice model.

The inequality of treatment is overtly exemplified by the treatment rendered to members of different minority groups. Research has shown that minority clients are discharged more quickly (from inpatient services) and are more often seen for minimal supportive psychotherapy rather than individual or group therapy (Sue, 1977).

When Jesus said "come to me, *all* you who are weary and burdened, and I will give you rest," he did not mean to exclude any person. Jeeves (1976) affirms this point by saying that because man was made in the image of God, that fact alone "spelt out the equality of all men before God, so within the community of the new humanity there can be no division of race or class (p. 75)."

Community mental health is slowly taking up the task of rendering services to minority group members with the utilization of bilingual therapists and services that are placed within particular ethnic communities. Theology affirms those aspects of community mental health that upholds God's design for the essential equality among humankind.

Conclusion

Community mental health has been shown to be affirmed by and integrated with theology through the concepts of prevention, positive mental health, and social-environmental influences. Each of these have roots in a common world view which is taken from Oden's rubric of "covenant ontology" and Collins' premise of God's truth being the source of all truth. From this world view a topical consideration of various methods, dynamics, and services within the community mental health orientation reveals that theology affirms each area.

It is the hope of this author that mental health workers, as well as the community at large, may become uniquely involved in community mental health, a field that embodies much of God's truth. May they contribute and further draw attention to the *agapic* type of love that is so inherently necessary to the healing and growth of individuals. Karl Barth (1958) wrote about the kind of love that may form a foundation to the discipline of community mental health:

> Christian love turns to the other purely for the sake of the other. It does not desire it for itself. It loves it simply because it is there as this other, with all its value or lack of value. It loves it freely. (p. 733)

Indeed, agapic love needs to be at the foundation of such a system. To this, theology may be more than just *for* community mental health.

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If we life our faith—taking part in all the feasts and occasions of worship of the church, rejoicing in the Lord with the community, reading the Bible regularly, repenting for our sins and infirmities, bearing part of the burden of the church, fulfilling our church obligations, accepting suffering for the sake of the community of faith, witnessing to Christ in life and word, educating ourselves in the literature of the church, really interesting ourselves in what is happening today to the Christian communities all over the world, following the movement of evangelization all over the world, steeping outselves in the great sacred literature, art and music, leisurely meditating with friends in the Holy Spirit on the mystery of the life of the spirit, thinking of Jesus Christ all the time and loving him above everything in the world including outselves, always giving God the praise and glory—then faith in God the Creator of everything from nothing is the most natural and unshakable thing we acquire, and we neither ask nor care to ask for any certification of this faith from any science. "All things are delivered to me of my Father; and no man knoweth who the Son is, but the Father; and who the Father is, but the Son, and he to whom the Son will reveal him." (Luke 10:22)

Charles Habib Malik
A Christian Critique of the University, InterVarsity Press, Downers Grove, Illinois (1982), p. 51.

Notes on "Science and the Whole Person"—
A Personal Integration of Scientific and Biblical Perspectives

Part 19

Energy and the Environment (A) Is Energy a Christian Issue?

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I am constantly reminded of a definition that evangelist Tom Skinner offered in an address I heard him give: "What is God's agenda for the Christian? God's agenda for us is that we should be living models on earth of what it means to be citizens of heaven." These are the good works that God has before ordained that we should walk in them. They tie us to the environment in which we live, the earth that is our home, and the energy sources that allow life and civilization to continue. In a series of three installments, I consider whether or not energy and conservation constitute Christian concerns, the nature of the barriers to responsible living in our environment, and finally particularly those concerns related to nuclear energy and nuclear warfare. Because our interaction with the environment in our modern world is so much dominated by advances in science, technology and engineering, no attempt to integrate perspectives on science and Christian faith is complete without a consideration of this interaction.

Recent years have seen ups and downs in our concern about energy. Our perception is tied closely to the length of time we have to wait at the gas pump, or to the cost of fuel gas and oil. We learn exceedingly slowly and each temporary indication of a good supply of gasoline is accompanied by a swing back to the purchase of large fuel-inefficient cars. We can be assured, however, that energy concerns will continue to loom large in the years ahead, if we can refrain from destroying ourselves by nuclear warfare, and if the Lord tarries. Are these questions that Christians should be concerned about *because* they're Christians, or are these just affairs of concern to the secular world that we Christians should not bother with – having the more important spiritual business to be about?

In this installment I consider briefly several reasons that are usually advanced for Christians to excuse themselves from this involvement, and then several inputs from Christian theology.[1]

A Lack of Faith

Christians shouldn't be concerned about energy and conservation because to be concerned is to show a lack of faith. This is the first argument that we sometimes hear. The argument proceeds: to believe the stories of an impending energy crisis indicates simply that we have not learned that our God is sufficient for all our needs. There will be no energy crisis – at least for God's people – because God will not let us suffer, provided we pay attention to our spiritual business and avoid entanglement in the mundane matters of the world. *Others* – who are not Christians – may indeed be concerned. Their concern testifies to their lack of faith; our lack of concern testifies to our faith. So the first argument goes.

It continues with the observation that Christians trust God to deliver them; if they continue to obey His commandment to multiply and have dominion – as they always have – they can and should leave everything else simply to God's direct action. Such is the message, for example, of the Bible-Science Newsletter. Our attempts to plan ahead signal our lack of trust in God; challenges to present courses of action indicate a lack of spiritual insight.

But such an argument neglects the "living out" of Christian faith in life. It forgets that God has revealed that He often chooses to act through the lives and efforts of those who are committed to Him. Instead of a genuine appeal to faith, such an approach is in actuality a retreat to irresponsibility, a denial of the commands of Christ that His disciples should be obedient.

This argument represents the first general and broad issue that Christians must face on many fronts: responsibly and faithfully making the distinction between lack of faith and irresponsibility; between doing nothing and trusting God, and being unfaithful stewards. The boundary between lack of concern because of true spiritual trust and the irresponsible neglect of the duties to which God calls us is at times a gray area indeed. It is an area to which Christians must constantly be addressing themselves, being careful to avoid the pitfalls on either side. It is the type of issue to which a "neither/nor" ethical approach is admirably suited.[2]

A Materialistic Emphasis

Christians shouldn't be concerned about energy and conservation because to be concerned is to commit oneself to the material rather than the spiritual. This is the substance of the second common argument. Jesus tells us not to lay up treasures on earth, not to be anxious for matters of this life such as food, clothing – energy? But to devote ourselves instead exclusively to the matters of the spiritual Kingdom.

It is true, such arguers may admit, that in the Old Testament the people of God did know how to glorify God through concern with the material (e.g., building the Ark, the tabernacle, or Solomon's temple), but the New Testament spiritualizes the theological significance of these works, and therefore calls for a spiritualization of one's attitude to the earth and its "stuff" as well. The Old Testament did have an earthly kingdom, an earthly people, and earthly promises, but for us in post-New Testament days to be preoccupied with material things is symptomatic of spiritual immaturity.

But to draw such a contrast between Old and New Testaments does violence to basic Christian convictions about the Bible – after all it is the Old Testament in Genesis that sets forth the origin of man's responsibility so often quoted by all. Warnings against idolization of the material hardly indicate that the Christian has no responsibility for his care and use of materials. Warnings against subservience to the material hardly indicate that a Christian's spiritual commitments can be expressed in non-material terms. A full biblical picture shows us the whole person: whose spirituality at least in this life is inseparably wed to bone, blood and tissue.

Here in this argument we see a second broad and general issue for Christians: how to properly evaluate the relationship between the physical and the spiritual. Discussions of the question are strewn with dichotomies between living and non-living, between body and soul, between natural and supernatural,[3] dichotomies that find their ultimate foundation, not in biblical revelation, but in classical philosophies.

The World is Soon Ending

Christians shouldn't be concerned about energy and conservation because concern for material things is inappropriate since the world is soon coming to an end. The third argument starts with the assumption that the return of Christ and the end of this age will occur within the next generation (or this one), and that therefore nothing is important at all for the Christian except preaching the Gospel. Anything that detracts from this is to be put aside. Sometimes the case is made that Christians should even rejoice in the impending calamity of the energy crisis – it is but one more sign of our Lord's return, hardly an appropriate area for a Christian to become involved in order to *prevent* such a crisis!

The boundary between lack of concern because of true spiritual trust and the irresponsible neglect of the duties to which God calls us is at times a gray area indeed.

But the biblical teaching of the imminency of Christ's return has always been seen as both a comfort and a warning - with nothing clearer than that no one knows the day or the time. When concern with eschatology calls for a withdrawal from human responsibilities, it ceases to be faithful biblical exegesis and instead becomes cultic. Watching and waiting for Christ's return must always be coupled with our call to be salt and light today.

A probably apocryphal story relates how someone asked Martin Luther what he would do if he were sure that Christ were returning the next day. "Why," Luther is reported as replying, "I would plant an apple tree today." Today is the day for planting even if tomorrow is the day for ending (or beginning!). Each day is to be lived as if Christ were indeed returning tomorrow, but with that responsible planning and concern that would characterize the case if Christ were to delay for a thousand years.

The third general issue for Christians is seen here: how to work daily responsibly and faithfully for the preservation of a world destined ultimately for destruction.

No Apologetic Value

Christians shouldn't be concerned about energy and conservation because discussions of energy involve "merely practical" courses of action and nothing that is useful for Christian apologetics. Problems worthy of Christian consid-

eration, so a fourth argument goes, should have a *Christian* solution – different from all other solutions and easily identifiable – so that such consideration can at least serve our Christian witness. Such an approach sees all non-Christian solutions drawn up on one side and *the* Christian solution in stark contradistinction on the other; if such a dichotomy cannot be envisioned, interest lags. Possible solutions are regarded without interest because they appear to be "merely practical" solutions, rather than uniquely Christian solutions exposing the fallacy of secular attempts.

But this is not the way things are. Many problems in life require Christian solutions that *look* like non-Christian solutions. Motivations may or may not be different, but the course of action will often be the same. A Christian and a non-Christian coming upon a small girl who has fallen into a well both have the same practical course of action: get a rope and help to pull her out! It is not as if the Christian has a "spiritual" solution in this case, such that the non-Christian runs for the rope but the Christian stands still, prays and waits for a miracle. Presumably the Christian *will* be praying while running for the rope! In many other areas the solutions sought may be the same for Christian and non-Christian, whether directed toward preservation of the environment, protection of endangered species, moving away from nuclear warfare etc.

For the Christian to withdraw from all except obviously uniquely Christian approaches is for the Christian to withdraw from his responsibilities before God. He fails to recognize the centrality of the Christian commitment to all of life and not simply to peripheral spiritual issues where Christian distinctives can readily be defined and defended.

This is a fourth issue for the Christian therefore: the tension between the practical and the Christian, between working effectively in Christian discipleship vs being unequally yoked with non-Christians in cooperative ventures.

It is hopefully evident from these considerations of four principal arguments advanced against Christian concern for the mundane matters of energy, conservation and the environment, that faithful biblically directed discipleship demands Christian involvement in these matters. To see the positive inputs from the biblical revelation that call for this involvement, we turn now to the topics of creation, stewardship, and concern for the poor.

Creation

The fact that energy must be a Christian issue follows directly from an assessment of the whole biblical view of the relationships between human beings and the earth. The earth is a gift given in trust to us by God. The end purpose of the creation account (whether modeled by the six days of Genesis or the sequence initiated by the Big Bang) is the appearance of human beings, called to be God's stewards (caretakers, deputies, or custodians) over the earth. The earth belongs to God; He appoints men and women as His stewards over it.

The law of Leviticus and Deuteronomy reveal God's concern for the land: the concept of ownership is revised – we do not own in some absolute sense, but we care for it (or abuse it) for God. "The land shall not be sold in perpetuity, for the land is mine . . ." (Lev. 25:23).

The moral faithfulness of God's people is linked with the condition of the earth in Hosea 4:1–3 and Isaiah 24:4–6:

> . . . there is swearing, lying, killing, stealing, and committing adultery. Therefore the land mourns, and all who dwell in it languish, and also the beasts of the field, and the birds of the air; and even the fish of the sea are taken away.
>
> The earth lies polluted under its inhabitants; for they have transgressed the laws, violated the statutes, broken the everlasting covenant. Therefore a curse devours the earth.

The created order will share in the redemption won by Christ (Roman 8:19–22).

Stewardship

The basic commandment yielding what is often called the "cultural mandate" is given in Genesis 1:26–30. The term "stewardship" needs to be rescued from the narrow mold into which it has been forced by ecclesiastical use: one's financial giving to the church's needs, usually through a regular offering (hence Stewardship Sunday). Rather we must see stewardship in its full sense of our responsible care of all things in the created universe that God has given into our trust: land, water, air, energy, material resources – everything that characterizes our "Spaceship Earth."[4]

Faithful and unfaithful stewards figure large in Jesus' parables in Matthew 20 and Luke 12. Paul likewise indicates that stewards are required to be trustworthy in I Corinthians 4:2, Titus 1:7; see also I Peter 4:10. We've lost the sense of global stewardship because we think that everything *belongs* to us. Of course, if it really belongs to us, there is no meaning in stewardship; for a steward is one who serves another to whom all things truly belong.

From all the biblical teaching on stewards, one basic conclusion can be drawn: *stewards are required to be faithful.* Stewards are not necessarily called to be ultimately *successful,* but rather to be faithful now. Stewards are not called to solve all the problems, but rather to be faithful where they are. Such faithful stewardship is a personal

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commitment: it brings us to the point of fulfilling Tom Skinner's definition of God's agenda for us. We are called to live in this way not *only* because it is effective, not *only* because it works (and it is and does!), but primarily because we desire to live in the way that we say we believe we should.

Stewards are not responsible for all the Master's work. He left ten, five and one talent to particular people. But we are responsible for *what we can do*. The wise steward does not underestimate just how much it is that can be done, but neither is he or she paralyzed by the magnitude of everything that needs to be done.

We must see stewardship in its full sense of our responsible care of all things in the created universe that God has given into our trust: land, water, air, energy, and material resources.

Concern for the Poor

Christians should be particularly aware of the situation of the poor with respect to energy. Of all people involved, Christians should have here a specific sensitivity.

When people speak of developing energy sources so as to allow the standard of living to continue and even to increase, they are speaking about the wealthy and developed nations and not the poor people of the world. The development of limited resources for the benefit of the wealthy nations all too often means no more than even less chance of energy utilization by the poor and developing. The concern to preserve national energy strength may be little more than a program to insure that the poor stay energy deficient. The argument that we must indiscriminately develop our coastal oil resources because otherwise we may be "forced" to militarily take "our" oil away from those countries where the wells exist, is unbelievable arrogance. Christian concern for the poor calls for a very special involvement in energy matters.

If political treatment of the energy problem all too often leaves out the concerns of the poor, economic treatments have often the same effect. The economic assurance that no energy crisis is coming because the cost of energy will rise as it becomes scarcer, thereby preventing any crisis – hardly does justice to the needs of people who feel the crisis as soon as they are unable to afford the more costly energy.

Even the quest for more and inexpensive sources of energy is not the final answer, however. For we are limited by the earth itself in how much *more* energy we can produce on earth without so radically changing the environment that human life itself suffers. This limitation has two parts: (1) the production of new energy sources *of any kind* inevitably damages the earth through air and water pollution, exhaustion of nonrenewable resources, increase in the carbon dioxide layer and the greenhouse effect, damage to the ozone layer, or nuclear radiation and waste disposal; and (2) even *with none of the above,* when thermal pollution by generation of new energy reaches about 0.1 Sun, dramatic climatic changes and melting of the polar ice caps follows as the ultimate limit.

At about this point, someone will suggest that all we have to do is leave the earth and colonize space. I wish them well – but cannot believe it is a viable option.

Summary

Every aspect of the analysis of the energy problem emphasizes that no simple solutions are valid, that no amount of sloganeering, crusading, or demonstrating is really adequate for the task – although it must be recognized that in our peculiar society they may be necessary to get the ball rolling!

Christians are called to recognize the complexity of the fallen world, while still seeing the possibilities for redemption through the power of God. Devotion to such fidelity may not lead to public acclaim, but it is the only path open to a faithful steward of Jesus Christ.

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[2]R. H. Bube, "Science and the Whole Person. Part 8. Ethical Guidelines," *Journal ASA 30*, 134 (1978).

[3]R. H. Bube, "Science and the Whole Person. Part 9. The Significance of Being Human," *Journal ASA 31*, 37 (1979).

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TOPICS FOR DISCUSSION

1. Jack and Mary are college students taking a class on organic chemistry. Both are also actively engaged in the evangelical Christian group on campus. A big chemistry exam is scheduled for Monday, but a prayer retreat is scheduled for the weekend. Jack goes to the retreat because he feels spiritual things must take precedence over secular, and prays that God will give him the knowledge he needs for the exam. Mary studies in her room all weekend because she feels that her first responsibility at college is to her witness through her studies, and prays that God will bless the prayer retreat in her absence. Which acts responsibly?
2. An old saying states, "God helps those who help themselves." Is this a cynical commentary by non-Christians or a pragmatic assessment of created reality?
3. Would there be life on earth if it were not for the sun? Is the provision of the sun for life natural or supernatural? Is it more spiritual to be a minister or an engineer?
4. Comment on the following criticism of Christian environmental involvement: "When a ship is sinking you don't run around trying to patch up the holes! You try to save the lives of the passengers and crew."
5. Can our belief in Christ's return become an *excuse* not to tackle some difficult problems on earth today?
6. I saw a sign at a Christian booktable at Berkeley that read, "Jesus Christ is the Answer, but what is the Question?" Does this have a bearing on trying to find "Christian" solutions to environmental problems?
7. Discuss some mechanisms by which we might hope to enhance the awareness that no one *owns* anything ultimately.
8. I frequently walk down the halls of my university building at night or on weekends and turn off unused lights. Is this a meaningful exercise of energy stewardship? Why, or why not?

9 A person working in a Third World nation in Africa reports that the common tool is a hoe. The plow is a technological advance that has not yet made its arrival on the scene, even the wheel is little used. What relevance do our discussions of energy development and conservation have to these people?

10 How do you feel about optimistic statements that we are going to set up space colonies or colonize other bodies in spaee and solve all of our major problems on earth? Do you suppose that human nature will be different in space than on earth?

The Open-Endedness of Scientific Truth

At the turn of the century the physical sciences were not considered particularly good fields to enter into. Many senior physical scientists were giving the following advice to bright, prospective students: "Consider carefully whether you want to go into physics or chemistry. There really is not much that is exciting to discover any more in these fields. After all Newton's laws of mechanics and Clark Maxwell's formulation of the electromagnetic field laws have enabled us to completely understand the nature and behavior of physical reality. The only thing really that is left to do in the physical sciences is to work out the next decimal place in our quantitative understanding of the world." If really pressed by the students, the senior scientists might admit that there were some small anomalies present with respect to our understanding of physics, in particular black-body radiation and the sharp lines observed in atomic spectra. But the senior scientist would say with a shrug: "It is only a matter of time before these small discrepancies in our current understanding of physics will be adequately explained." Today we know that these two small discrepancies" (and others) did not disappear but rather caused a huge "crack" to appear in the structure of classical physical theory. Indeed completely new and revolutionary theories, relativity and quantum physics, were developed in order to make the "crack" shrink away. Planck, Einstein, and Bohr, among others, developed this new theoretical structure which, while radically different from the old physics, nevertheless contains the laws of Newton and Maxwell as limiting cases (low velocity and large mass objects approximately obey Newton's and Maxwell's laws) of its more general formulation. Thus the whole structure of physical science was altered in revolutionary fashion; new laws of physical science were developed that led to prediction and successful observation of many strange new particles at the level of the very small, and equally strange objects such as neutron stars and quasars at the level of the very large; i.e., all of outer space.

This little episode from the history of science serves as a warning to scientists never to assume their work as scientists is finished. And it opens up for discussion the general topic of whether man will ever have a fully complete and consistent theory of physical reality. Will the task of science ever be finished?

Kurt Goedel, one of the most brilliant mathematicians of this century, in 1931 devised a profound and significant mathematical theorem that sheds much light on this question. Goedel's theorem has to do with the internal consistency of mathematical systems: ". . . it states among other things that if one builds a mathematical system based upon a set of consistent axioms, or postulates, then within the system statements will be discovered such that (1) no exception to these statements is ever found, yet (2) these statements cannot be proved, i.e., derived from the axioms of the system (True but not decidable from within the system, parentheses mine)."[1] As all theories of modern physics are based upon mathematical systems, Goedel's theorem has great import for physics as well as mathematics. ". . . It tells us that if man ever builds what he regards as a complete theory of the physical world, one based upon a set of fundamental laws such as we have discussed, then new truths will be discovered, and these truths will require additional laws for their explanation. In other words, if at sometime man wonders whether or not he has discovered all of the fundamental laws of nature, he can be sure that he has *not* and that there is at least *one more* fundamental law to look for. The search for new truths should never end."[2] Thus as theoretical science ultimately depends upon mathematics in all its creative endeavors, Goedel's theorem tells us that all such activities will be forever open-ended. To quote Stanley L. Jaki:

> It seems on the strength of Gödel's theorem that the ultimate foundations of the bold symbolic constructions of mathematical physics will remain embedded forever in that deeper level of thinking characterized both by the wisdom and by the haziness of analogies and intuitions.[3]

The open-endedness of scientific truth is again pointed to in the concreteness of nature that is rich beyond comprehension in aspects and features:

> . . . in view of the extreme richness of the features of the physical world, one should not marvel inordinately how space can be non-Euclidean or how complex numbers can be so successful in dealing with alternating currents and an almost endless array of physical processes. The novelty present in those processes is far from being exhausted. No one would dare assume today that there is nothing new for man to observe in the physical world. Consequently, the formulation of new mathematical theories useful for physics will very likely go on indefinitely. For it is not only himself that the mathematician cannot get away from; he cannot get away from the physical world either. It is there, in an immensely variegated nature and not in his finite intellect where ultimately lies the never-ending challenge for the mathematician.[4]

Recent developments in our understanding of cosmic and biological evolution suggest another argument for the open-endedness of scientific truth. It is increasingly recognized that there is one broad feature that seems to be common to both cosmic and biological development as well as some aspects of social and cultural history. It is the tendency for more and more complex structures to emerge in the world. Most scientists would agree that cosmic evolution has been attended by a great increase in the richness and diversity of more complex forms; new and very different kinds of behavior and properties have *emerged,* requiring new methods of description and new languages that are not reducible or describable by characteristics of earlier levels of complexity.

Recent work by Ilya Prigogine[5] on the thermodynamics of open systems has provided a credible theoretical description of how the process of emergence takes place; of how such highly ordered systems as living organisms could ever emerge from a world in which

irreversible processes always tend to lead to an increase in entropy, in disorder.[6] From an originally homogeneous system, a highly ordered structure has appeared because of the fluctuations that are possible in a non-linear, open system far removed from equilibrium. The fluctuations in such an open system have been amplified, and through the ordinary laws of physics and chemistry a new structure has appeared that is ordered first in time and then in space—a new kind of alliance of chance and law. For such open, nonlinear systems far from equilibrium fluctuations can force the system to leave a given macrostate and lead it on to a new state that has a different spatiotemporal structure. Then it is possible that further fluctuations can arise from the new state that cause the process to repeat itself, a still newer spatiotemporal structure being produced and so on (FLUCTUATIONS ⇒ SPACE–TIME STRUCTURE). By such open system processes, Prigogine argues living matter first emerged from inanimate matter; or, as another example, a more complex, functionally different culture could emerge from a very simple culture. Basic laws, however, remain invariant as the system emerges into a much more complex state. Christ's two commandments with respect to human conduct—love God with all your heart and then your neighbor as yourself—remain valid for all cultures irrespective of their technological and social complexity.

Thus the thermodynamics of open systems provides plausible physical mechanisms for the basic thesis of cosmic, biological, and possibly cultural development; that thesis being the continual emergence of more and more complex structures that possess qualitatively new and different behaviors and properties. If the evolution of more complex structures occurs, indeterminant behavior will increase in that new possibilities also increase as a result of the greater complexity. This greater indeterminacy of behavior leads to new behavior patterns; in a similar way new properties can emerge. The continual emergence of greater complexity in the universe has a direct correlation to the structure of scientific truth; if new behaviors and properties are continually coming into being, the scientific truth associated with these behaviors and properties is not static but is, on the contrary, ever expanding. Thus the very nature of the evolutionary process leads to an expanding structure of scientific truth; scientific truth is forever open.

I, personally, am willing to accept the possibility of God using evolutionary processes in His creative activity but I view these processes as suggesting that intelligence has been at work in creation. Modern evolutionary theories make much use of the assumption that great order is inherent to all levels of the cosmos. Secondly, I see chance entering evolutionary descriptions because humans don't have God's complete knowledge; I believe that it is possible to have a concept of chance that is fully compatible with God working in a purposeful, fully rational manner.

Figure 1 illustrates in schematic fashion this open-endedness of scientific truth. As time passes new and more encompassing theories are developed that resolve undecidable questions present in earlier theories, the older theory being a special case contained in the new. The new theory is more comprehensive as it encompasses the older theories and explains more phenomena; but, eventually, problems are raised that are not decidable in the new theory, so again a new broader theory must be developed and so on. Science, therefore, will never end; it will continue to expand till God bring's "down the curtain on physical reality."

Two philosophers who have clearly grasped the nature of science's open-endedness are Michael Polanyi and Thomas F. Torrance. Polanyi precisely recognized that the true objectivity of a scientific theory is due to its open-ended structure:

> "One may say, indeed, quite generally, that a theory which we acclaim as rational in itself is thereby accredited with prophetic powers. We accept it in the hope of making contact with reality; so that being really true, our theory may yet show forth its truth through future centuries in ways undreamed of by its authors. Some of the greatest scientific discoveries of our age have been rightly described as amazing confirmations of accepted scientific theories. In this *wholly indeterminate* scope of its true implications lies the deepest sense in which objectivity is attributed to a scientific theory (italics mine).[7]

In defining the nature of physical reality Polanyi again acknowledges this openendedness while also pointing out how deeply scientists depend upon hope and commitment as they go about their scientific tasks:

> . . . We make sense of experience by relying on clues of which we are often aware only as pointers to their hidden meaning; this meaning is an aspect of a reality which as such can yet reveal itself in an indeterminate range of future discoveries. This is, in fact, my definition of external reality: reality is something that attracts our attention by clues which harass and beguile our minds into getting ever closer to it, and which, since it owes this attractive power to its independent existence, can always manifest itself in still unexpected ways. If we have grasped a true and deep-seated aspect of reality, then its future manifestations will be unexpected confirmations of our present knowledge of it. It is because of our anticipation of such hidden truths that scientific knowledge is accepted, and it is their presence in the body of accepted science that keeps it alive and at work in our minds. This is how accepted science serves as the premise of all further pursuit of scientific inquiry.[8]

Theologian and philosopher Thomas F. Torrance continues the arguments of Polanyi indicating that the open contingency of

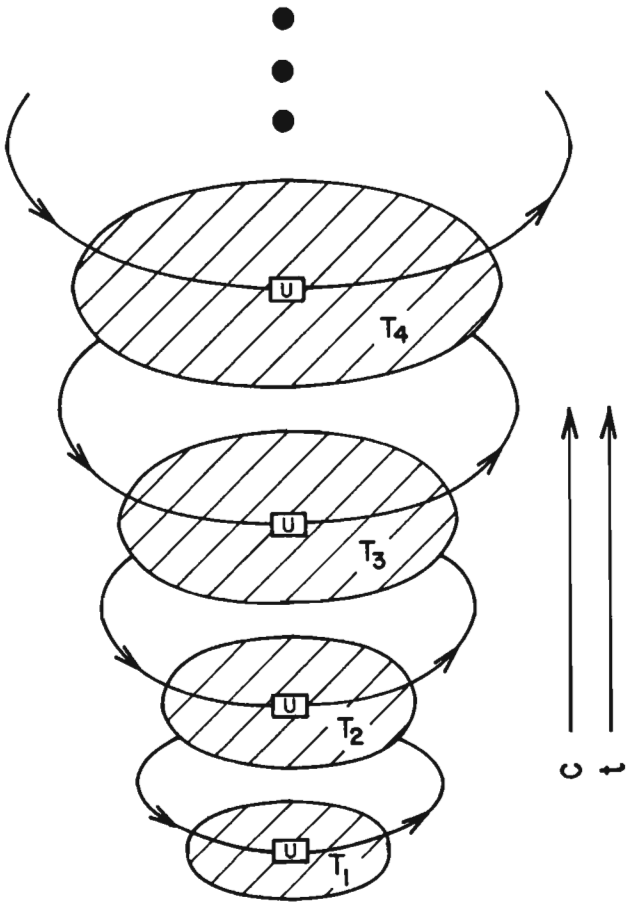

Figure 1. The Open-endedness of Scientific Truth. Nomenclature: T_i - A Scientific theory. U - Undecidability, basic questions of science that are not decidable from within a particular scientific theory. t - Increasing time. C - Increasing comprehensibility and encompassibility of scientific theories.

physical reality points clearly in one direction, the religious dimension:

> . . . As the universe becomes progressively disclosed to our scientific inquiries it is found to be characterized by an intrinsic intelligibility of an ever deepening dimension which far outranges our powers of comprehension, invoking from us awe and wonder. Moreover, we become aware of being confronted in and behind it all with a transcendent reality over which we have no control but which, while utterly independent of our minds, has an indefinite capacity for revealing itself to them in quite unanticipated ways. It is indeed in response to this transcendent reality that our minds develop their own powers of comprehension and in recognition of it that they derive their primary thrust in passionate search for understanding and truth. . . . However, the more intensively we probe into the inherent profundity of the universe, the deeper the dimension in which its objectivity and intelligibility become disclosed to us, the more we find our epistemic relation to it being reversed: we are up against a reality that towers above our intelligence, which we cannot know by inquiring into it from 'below', as it were, by submitting our minds to the authority of what it actually is and seeking to apprehend it by allowing our understanding to fall under the power of its intrinsic but transcendent intelligibility, but this is to embark upon a course of humble discipline in which our minds will be stretched beyond our capacities which they may claim to have in themselves. As Polanyi has argued, this is the kind of experience we have even in the study of some great historical personality where 'we need reverence to perceive greatness, even as we need a telescope to observe spiral nebulae'.[7]

This open-endedness of scientific truth is a special case of a much more general open-endedness that is characteristic of all truth, not only scientific truth. Let us recognize that truth could not exist if it were not for God who is the source and standard of all truth, for He himself is the truth. Truth exists because there is no deception in God, He keeps truth forever; His steadfastness, consistency, and His reliability in being and action guarantees the very existence of truth. As God is the source of truth His nature determines the characteristics of truth. In particular the Bible portrays God as the Infinite One, who does not exist in any necessary relations, because He is self sufficient, but at the same time can freely enter into various relations with His creation as a whole. God, as infinite Being, is free from all limitations; to quote Orr: "Perhaps we can say that infinity in God is ultimately: (a) internally and qualitatively absence of all limitation and defect; (b) boundless potentiality."[10] A classic biblical statement of this is found in Psalm 145:3—"Great is the Lord and greatly to be praised and *His greatness is unsearchable* (italics mine)." Absence of all limitations implies that the Infinite God in all His creating and sustaining activities toward His creation acts freely, not necessarily; as Psalm 115:3 puts it—"Our God is in the Heavens, *He does whatever He pleases* (italics mine)." God's freedom in His creative activities is one aspect of His transcendence with respect to what He has created, for God is independent and different from all His creatures. As Isaiah 55:8–9 puts it—"For my thoughts are not your thoughts, neither are your ways my ways, says the Lord. For as the heavens are higher than the earth, so are my ways higher than your ways, and my thoughts than your thoughts."

Thus we see that the open-endedness of all truth contained in created reality is a reflection of the very nature of God, the source of all truth. God, who is transcendent with respect to His created order, is the Infinite One, being without limitations and inexhaustible in His creativity, possessing boundless potentiality. All of God's creating and sustaining activity toward His created order is furthermore done in a perfectly free manner; there is no necessity in all God's actions. God, the source of all truth, is free and inexhaustible in His creativity; is it not therefore reasonable to expect that all truth found in created reality would be open-ended in nature always pointing beyond itself, ultimately pointing back to God, the author of all truth?

One last point. Curiosity is a trait deemed essential to all human creativity, especially scientific creativity.[11] Indeed, curiosity may well be one aspect of man being made in the image of God. For, God in His own way was and always is curious; as one example, God asked the first man to name the animals for "He brought them to the man to see what he would name them (Gen. 2:19)." It is particularly appropriate therefore that God has created reality in such a way that it can only but enhance man's curiosity and hence his creativity. The open structures of truth continually motivate man to exercise his curiosity in all of his explorations of the created order. God's created reality continually startles man with new and unexpected objects and relationships; it is both very simple and yet at the same time very complex; only the very curious can penetrate into its inner depths. Thus it can be readily seen that there is one attitude that will really stop all human creativity; that attitude is a closed mind, a mind not receptive to the open-endedness of truth, a mind that believes all is known and nothing more remains to be explored and understood. Christians have traditionally believed that God has revealed Himself to man through two "books"—The Bible, God's written word, and the "bible of nature." I think that one can historically argue that the Christian and scientific communities have been the most unproductive and ineffective in their respective missions when they assumed that either the Bible or the "bible of nature" could be represented by some closed, final system.

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[9]Thomas F. Torrance, *Space, Time, and Resurrection*, William B. Eerdmans Publishing Co., Michigan, 1976, pp. 191–192.
[10]L. Berkhof, *Systematic Theology*, Wm. B. Eerdmans Publishing Co., Michigan, 1941, p. 60.
[11]For an interesting discussion of the importance of curiosity in the creative personality see James H. Austin, *Chase, Chance, and Creativity*, Columbia University Press, New York, 1978, pp. 104–112.

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Artificial Intelligence Research: An Evangelical Assessment

"What has Jerusalem to do with Athens, the Church with the Academy, the Christian with the Heretic?" (Tertullian)

The above quotation from Tertullian may be the first impression one has when considering the relationship between artificial intelligence, its concomitant philosophical underpinnings and the biblical, evangelical view of humanity. Artificial intelligence seems to be either an esoteric discipline of the computer scientist or the literary ramblings of the science-fiction author in a pulp novel. The biblical and evangelical perspective on man seems to belong more to the realm of theological speculation and theological science. The two seem to have little or no relation to the other.

It is my opinion that the relationship of these two fields highlights several areas of conflict between modern manifestations of the social sciences (as exemplified in artificial intelligence (AI) research and methodology) and the traditional, biblically based view of one's personhood.

It is my thesis that research in artificial intelligence represents the logical outcome of social science assumptions concerning humanity and the means used to understand our social existence. The impact of artificial intelligence upon our concepts of ourselves is sufficiently important that one writer has remarked, "literature on robotics is nothing less than a debate on the meaning and purpose of existence" (Hexham 1980; p. 574). For S. L. Jaki (1969; p. 11), artificial intelligence represents the latest phase of scientism or physicalism, an approach that owes its impetus to the general success of physics and assigns virtually unlimited wisdom to the physical sciences.

I am also concerned with the extent to which artificial intelligence assumptions color our thinking. This is reflected in the popular literature of the day. These assumptions are rarely, if ever, addressed from a theological perspective.

An example of the popular (and widely held) view that computers and brains are identical is that expressed by Lees in *Creative Computing* (1977), "One way or another, we are going to run into another intelligence before much longer . . . we will not remain alone." One such intelligence considered most likely by Lees is that of artificial machine intelligence. A recent book blithely assumes the ultimate equality of personality and mechanism in its very title, *Machines Who Think* (McCorduck 1979). In this text of the history of artificial intelligence research, we hear that AI is to be a "new species on the horizon" and that this development will be "very humbling to us." These sentiments represent a widely held view that any evangelical analysis must deal with. This view is not limited to the relatively small computer science or electrical engineering community. A very popular writer in the genre of science popularization, Carl Sagan, has argued that AI is inevitable and is simply an extension of evolutionist thought (Sagan 1977). Finally, a recent winner of the National Book Award, R. Hofstadter, simply dismisses those who doubt the possibility of artificial intelligence (in his book, *Gödel, Escher, Bach*).

Lest you think my protestations over the apparent religious fervor present in the writings of some authors is a misguided fear, I point to the work of Desmonde. According to Desmonde, ". . . computers will come to grips with all value problems . . . Mankind has to look to artificial intelligence for a new world where life will be meaningful" (Desmonde 1964; p. 5). This overblown rhetoric is not contained in an obscure (and hence relatively harmless) technical report or memorandum, but is rather presented in the introductory chapter of one of the most widely used textbooks in introductory computer science courses! The warning of Jaki thus seems to be particularly appropriate, ". . . the danger of machines derives not so much from the machines as from man's attitudes toward them" (Jaki 1969; p. 254). The use of the computer as metaphor for (or in many cases the exact equivalent to) the human mind and personality is also reflected in such works as *The Human Machine* (Aleksander 1978), *The Brain as Computer* (George 1961) or *The Metaphorical Brain* (Arbib 1972). In reference to works of this type, Jaki has remarked that "scientific fashions . . . get hold of the minds of several generations with no small damage to cultural values" (Jaki 1969; p. 9). I tend to concur with this view as it applies to the currently fashionable reductionistic social sciences, particularly as this reductionism is manifested in the artificial intelligence literature. This essay is a small attempt at answering the often implicit and frequently anti-Christian assumptions underlying this line of research.

Before beginning our analysis of the theological perspective that evangelical Christianity can apply to the AI literature, it might be helpful to point out several works that are useful for an assessment of the history of this computer science field. A detailed examination of the history of AI research can be found in either McCorduck (1979) or Dreyfus (1979). The former presents a quite sympathetic picture of the history and prospects for AI research, while Dreyfus presents an openly critical analysis. The basic thesis in Dreyfus, one with which I concur, is that the "field of artificial intelligence exhibits a recurring pattern: early dramatic successes followed by sudden unexpected difficulties" (Dreyfus 1979; p. 85). In addition, Dreyfus maintains (and, I feel, correctly) that there are innate man-machine differences in perception and that these qualitative differences render machine intelligence impossible. A similar thesis concerning the impossibility of artificial intelligence can be found in Weizenbaum (1976). Both Dreyfus and Weizenbaum, by the way, are professional computer scientists and were once both active in the AI research community. Finally, we also agree with Jaki that the literature of artificial intelligence blatantly overestimates computers and dramatically underestimates man (Jaki 1969).

While making no claim to exhaustiveness or definitiveness, it is nonetheless hoped that these thoughts may contribute a theological perspective from which to view and assess the current world view envisaged by the "artificial intelligentsia" (to borrow a phrase from Weizenbaum).

"If he should take back his spirit to himself, and gather to himself his breath, all flesh would perish together, and man would return to dust." (Job 34:14–15)

The above question, from that most human book of the Bible, Job, highlights the dilemma faced by anyone hoping to construct a distinctively Christian anthropology; namely, man is at one and the same time a creature made of dust, and yet, in the sight of God, a special creature in all of creation. This paradox or dilemma must always be kept in mind as we consider the theological and biblical issues and evidences.

Failure to maintain this paradox can lead either to a materialistic reductionism where, in the words of Arthur Koestler, the "anthropomorphic view of rats has been replaced by a ratomorphic view of man;" or to the converse danger in which the biblical insistence upons man's physical nature is replaced by a virtually docetic view of man (as in Descartes, for example).

One might be tempted to object that the relationship between cybernetics (or artificial intelligence research) and theology is a forced one; the two are separate and non-interacting fields of human endeavour. I reply only with that quotation from Hexham with which I am in complete agreement, "literature on robotics is nothing less than a debate on the meaning and purpose of existence" (Hexham 1980).

The Bible contains numerous words and phrases that might be applicable to our consideration of the nature of man's psyche. The first that we consider is *nous* (reason, mind). In classical Greek thought and usage, reason represented the central area of thought. (Plato for example equates the process of thought with a calculating process.) Plato also used the term (Phaedr. 247c) to refer to the ruling principle of pure thought and of the divine reason that resides in man. In this usage, the term *nous* has come down to our Western culture as that phase of thought that is basically docetic in its view of the body. This "disembodiment" of intelligence from the human body is an essential assumption of the artificial intelligence community. It is also crucial to note that this conception derives, not from biblical considerations, but from classical Greek thought.

Niebuhr has considered this position and has termed it the classical view of man. According to Niebuhr, this view argues that, ". . . man is to be understood primarily from the standpoint of his rational faculties" (Niebuhr 1949; p. 6). In his view, this attitude is

essentially dualistic and rationalistic. If we consider the history of artificial intelligence research (cf. McCorduck, Weizenbaum or Dreyfus), we can see that this opinion of Niebuhr concerning the classical view of man is essentially a correct assessment of the AI community.

When we turn to the Scriptures themselves, we see that the word *nous* has taken on rather different meanings and connotations (J. Goetzmann, "Reason in *TNIDNTT* 1978 vol. 3; pp. 122–133).

According to Goetzmann, Old Testament anthropology knows nothing of the Greek division of the soul or psyche into three distinct elements (cf. p. 124). The Old Testament understanding of "reason" is that it belongs to the will, and that its aim is less at a theoretical comprehension than at right conduct.

Likewise, in the New Testament the concept of *nous* is not central. For example, in twenty-one of the twenty-four uses in the Pauline corpus, it means simply religious understanding (e.g. 2 Thes. 2:12). Similarly, in the pastorals, the term *nous* is used as a virtual equivalent to "religion" or "faith." Examples of this latter usage may be found in 1 Tim. 6:6 and 2 Tim. 3:8. Finally, in Rom. 11:34 the phrase *nous theos* is used as a phrase to mean God's plan of salvation itself. Thus, in considering the word *nous*, we see that it means an essentially religious understanding and not a calculating function. More germane to our analysis of the biblical evidence pertaining to the claims of artificial intelligence research is the following observation. The entire thrust of the biblical conception of humanity is of a unified individual; there is no disembodiment of soul (or mind) from the body as there is in the case of classical Greek thought or in the assumptions of artificial intellience research.

A second word that may be of interest in our investigation of biblical evidence is *dialogismos* (think, reason, etc.). The term is used extensively in the New Testament (e.g. Rom. 2:3; Gal. 3:6; 2 Tim. 4:16). For Paul, the principle function of this word is in relating the foundations of faith to the righteousness of God (cf. J. Eichler "Think" in *TNIDNTT* vol. 3; pp. 820–825). For Paul, this faith is not an objective reasoning (or in the terminology of computer science, "computable") from a neutral (or "context-free") vantage point. Rather, faith is the process of being conquered by the crucified and risen Lord. The discrete, unambiguous hopes embodied in the assumptions of the AI endeavors pale in the light of the "scandal" of the cross. We should always keep in mind Moltmann's admonition that "Christian anthropology [is always] an anthropology of the crucified Lord" (Moltmann 1974; p. 20). The discussion up to this point has revealed that the biblical concepts relevant to "mind" seem to have a much greater existential content than an analytical one, to be more related to the realm of faith than to the cold world of calculation.

The term *phroneo*, which is generally translated as "mind," is also a non-technical term used in the New Testament that pertains to the realm of faith. As Goetzmann argues (J. Goetzmann, "Mind" in *TNIDNTT* vol. 2; pp. 616–620), the word comes quite near that of the Old Testament concept of "wisdom," and "such wisdon . . . is not merely rational discernment but is the result of God's people being turned to the obedience of faith, in accordance with Old Testament prophecy."

Finally in this consideration of the linguistic evidence we come to the various words that are translated as "man" (cf. C. Brown "Man" in *TNIDNTT*, vol. 2; pp. 562–572). Here, as in the case of *nous*, we can see the influence of classical Greek (not biblical) thought on the modern world view as espoused in the artificial intelligence community.

The basic Greek conception of the body-soul duality is present in the Apocrypha (e.g. 4 Macc. 2:21f) as well as the extrabiblical literature of the early New Testament period. As an example, Josephus (War 2, 8) speaks of the image of God as being present in man only within his *nous* (in this usage, only within his rational facilities).

This is quite a contrast to the Old Testament's essential physicality and the New Testament's lack of abstractions concerning the human psyche. We are seen to be different from animals and plants (1 Cor. 15:39); humans are also different from angels (1 Cor. 4:9). Most importantly, we are different from Christ (Gal. 1:12; Eph. 6:7) and from God (Matt. 7:11; John 10:33; Acts 5:29). On the whole, Brown concludes that "Man is seen as a whole being, and whatever touches one part affects the whole" (*TNIDNTT* vol. 2; p. 567f). This unitary view of man is noted by Ladd in his study of Paul when Ladd argues that "Paul never uses 'psyche' as a separate entity and he never speaks of the soul's survival of death" (Ladd 1974; pp. 457–459).

This essential unity of man's psyche and body is of fundamental importance in contrasting the artificial intelligence claims that man's essence is simply rationality and the rest of man is of greatly diminished importance. The biblical evidence will not allow this bifurcation of one's faculties as in the AI conceptions.

Having considered the strictly biblical evidences as shown by word usage, we now consider the various theological issues raised by claims of the artificial intelligence community.

We agree with Dreyfus (1979) and Weizenbaum (1976) that the claims of artificial intelligence researchers are greatly exaggerated. However, this incompatibility of claim vis-a-vis results is not without its danger to biblical perspectives. Scientific fashions (irrespective of their validity) have a way of capturing the imagination.

The first area of concern in the assumptions or theological implications of artificial intelligence research is in the area of man's unitary nature. The artificial intelligence research endeavor is essentially docetic in orientation, with its belief that man's essence is contained in and defined by his rationality (or more precisely in his "information-processing" capability). This position reflects a lengthy development in Western philosophical thought, ultimately deriving from classical Greek and not biblical perspectives.

Tillich, for example, traces this development as a process comprising two phases. First, he sees the development of what he calls "ontological reason." This is soon replaced in the western world-view with a concept of "technical reason." (Tillich 1957; vol. 1; pp. 70–75). It is this latter that is stressed within the artificial intelligence community. As defined by Tillich, technical reason is that tradition of philosophy which stresses only the cognitive side of reason (as an example he lists the English empiricists). He further adds that "Technical reason, however refined in logical and methodological aspects, dehumanizes man if it is separated from ontological reason" (Tillich 1957; vol. 1; p. 73). This emphasis upon the calculable or "technical reason," as is evident in the artificial intelligence research effort, is incompatible with the view of man as presented in the Scriptures. As Bloesch points out, this emphasis is a culmination of rationalism where, in the latter, ". . . the real is rational and truth signifies the whole" (Bloesch 1971; p. 69). This rationalism is in contrast with our insistence that faith precedes understanding (as in Augustine). As Bloesch phrases it, "Faith . . . is an acquaintance with Christ rather than a comprehension of Him" (Bloesch 1971; p. 68).

While we have disagreed with the conception of the artificial intelligence community in its assessment of mankind, which is that rationality is the "measure of man," we have not limited our conception of faith to the purely emotional or ecstatic. The realm of faith consists of both an objective and subjective pole. To stress the former can lead to a sterile scholasticism, while overemphasizing the latter can lead to a content-less enthusiasm. As Torrance phrases

this conceptual basis of faith,

> Knowledge of God is thus conceptual in its essential root with a conceptuality that derives from God's self revelation in Word, but which we bring to articulate expression in our understanding with a conceptuality that finds shape in our human forms of thought and speech yet under the control of God's own intelligible reality. (Torrance, 1971; pp. 21–22)

Faith always precedes understanding; ". . . the Christian life . . . must be grounded in the inwardness of faith . . . revelation can only be grasped by the inwardness of faith, and apart from this subjective dimension the objective data have little or no value." (Bloesch 1979, vol. 2; p. 259)

This is the fundamental difference between the artificial intelligence approach to man and a Christian anthropology. For the artificial intelligence community, man is essentially a rational calculating mechanism. For the Christian, man is a being created in the image of God and created to respond to his Creator.

This essential "respondability" of man is stressed by both systematic and biblical theologians. Berkhof agrees with this assessment of true human nature when he argues that the core of human nature is respondability (Berkhof 1979; p. 168). Ladd argues that, for Paul, man's true essence lies in the *pneuma;* "his inner self that is able to allow his relating to God" (Ladd 1974; p. 461–463).

According to Tillich, the essence of Christian faith is absolutely paradoxical (without the eyes of faith) and is hence completely foreign to the conception of man present in the assumptions undergirding AI research. He writes, "The Christian assertion that the New Being has appeared in Jesus the Christ is paradoxical . . ." (Tillich 1957; vol. 2; pp. 90–92). This, however, is the paradox upon which we base our entire existence!

Other differences between the contents of the AI image of man and a Christian anthropology could be outlined, but they pale in comparison with these two major and irreconcilable contrasts. The first of these two differences is the unitary view of humankind in the Christian anthropology (recall our unanimous confession of faith in the resurrection of the body), as contrasted with the rationalistic reductionism evident in the assumptions of artificial intelligence advocates. The second contrast occurs with the conception that, in the artificial intelligence view, rationality is the hope of our "salvation," (if I may use that phrase) whereas, for the Christian, faith and our personal relationship to our Lord and Savior precedes our limited understanding of God's plan and purpose for our life.

In closing, I would like simply to repeat an observation that Jaki has made concerning the nature of mankind that shows a great similarity to the biblical concern outlined above (Jaki 1969):

> . . . man, precisely because of his mind, is not a machine, but a marvel and ought to be treated as such.

> So God created man in his own image, in the image of God he created him; male and female he created them. And God blessed them . . . (Gen 1:27–28a)

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The Straw God of Stephen Gould

Most scientists are very familiar with the writing of Stephen Jay Gould. His monthly column in *Natural History* ranks him among the best of natural history writers, and his collection of these essays in *Ever Since Darwin* and *Panda's Thumb* have sold well as science books. Stephen Gould's face has graced the cover of *Newsweek* magazine, placing him in league with the few scientists who have become media stars (Carl Sagan being the most notable).

The skilled pen of Gould tackles subjects few other science writers would consider. Most recently, his writings have focused on the question of design in nature. How, he wonders, can Christians believe in the existence of a Designer when there is no true evidence of design? He is especially critical of creationists who use the argument from design to support their theories.

In his essay on "Organic Wisdom," Gould begins by noting that "Since man created God in his own image, the doctrine of special creation has never failed to explain those adaptations that we understand intuitively."[1] The problem, says Gould, is that creationists neglect the role of natural selection in bringing about perfection. He feels that the presence of animals that are exquisitely designed for their appointed roles argues as easily for evolution as for creation. Gould therefore sets out to demolish certain arguments which "rank high in the arsenal of modern creationists."[2]

The Design Argument

The crux of Gould's attack is on the design argument. While not the most persuasive argument for the existence of God, it nevertheless is an appealing one. Experientially, we all are compelled by its logic. When we happen upon a constructed object that shows design (such as a building), do we not immediately conclude there was a designer? Thus, when we observe the world with its intricate designs, do we not have strong evidence for a Cosmic Designer?

An arrowhead, for example, found lying in a rock quarry, would immediately raise certain questions about its origins—questions different from those raised by the ordinary rocks. The rocks display beautiful patterns or design that point to geological processes. But the arrowhead is different. Although it is made from the same material as the ordinary rocks, its design shows that it was *consciously* formed for a specific purpose. Likewise, when Christians come upon living organisms with intricate designs and DNA chains composed of as many as six billion nucleotides, isn't this evidence of a Designer? Skeptics aren't so sure.

How do we know that what we call design isn't a result of intrinsic properties in nature? Can't other forces besides an intelligent Designer bring them about? How do we know whether there really is design inherent in nature? Perhaps the arrowhead is really only a chipped rock that someone learned to use as a tool. That would mean that it has no design or purpose—only the purpose we have given it by the way we use it. Similarly, the argument goes, perhaps we see in nature a design that isn't really there. These are just a few questions that are left unanswered in discussions about the design argument. Thus, few are truly convinced by this argument alone.

Although the design argument is not compelling to many, Christians have used it if for no other reason than the fact that the Bible clearly states that the creation shows evidence of God. Psalm 19 begins by stating that "The heavens declare the glory of God; the skies proclaim the work of his hands." Romans 1:20 states that "since the creation of the world God's invisible qualities—his eternal power and divine nature—have been clearly seen, being understood from what has been made, so that men are without excuse." Clearly, the Bible states that God reveals Himself in the creation. We can see God's hand, even if we seen in a limited way. Gould, however, will have none of this and therefore rejects the proposition that nature reflects the action of a benevolent Creator-God.

Gould's Arguments Against A Creator-God

Stephen Gould's arguments against a Creator-God can be summarized into three basic arguments. First, Gould argues that *imperfection is evidence of evolution.* Mutation and natural selection do not necessarily result in the best form or mechanism. They merely give you one that works. He suggests that a Creator would not and could not create an imperfect world; He would have done better.

One example that Gould uses became the title of his book: *Panda's Thumb.* The panda, unlike our North American bears, possesses a thumb that it uses to strip bamboo leaves off the shoots. This thumb is actually an extra digit made by the extension of the radial sesamoid bone in the wrist. Because this is not the typical way a thumb is formed, Gould concludes that, "the panda must use parts on hand.... The sesamoid thumb wins no prize in an engineer's derby" but is the best solution evolution can find since the "true thumb is committed to another role."[3] Gould therefore argues that this imperfect solution shows evolution at work, not a Creator.

Second, he argues that *the useless, the odd, and the peculiar adaptation speak of evolutionary history.* Gould says "you cannot demonstrate evolution with perfection because perfection need not have a history.... But, Darwin reasoned, if organisms have a history, then ancestral stages should leave remnants behind. Remnants of the past don't make sense in present terms—the useless, the odd, the peculiar, the incongruous—are signs of history."[4]

Yet if God exists, Gould argues, He would have used more efficient or conventional methods rather than odd and peculiar mechanisms. For example, he reminds us that Charles Darwin wrote an entire book on the subject of orchids in order to show that their fertilization structures must have evolved from parts used by their ancestors for other purposes. Gould concludes that "Orchids are Rube Goldberg machines; a perfect engineer would certainly have come up with something better."[5]

Third, he says that *cruelty in nature argues against the idea of a benevolent God.* In his *Natural History* column, Gould cites William Buckland's (England's first official academic geologist) discussion of natural theology. Buckland wondered, "if God is benevolent and the Creation displays his 'power, wisdom and goodness,' then why are we surrounded with pain, suffering, and apparently senseless cruelty in the animal world?"[6] Gould gleefully states that Buckland's only answer was to argue that God used carnivores to prevent further pain and senility by swiftly killing their prey and thereby sparing them of their inevitable fate.

Analysis of Gould's Arguments

In looking at these arguments by Gould, it is fairly easy to see the "straw man" nature of them. He creates his own "straw god" and then pulls him apart. Gould's first argument—that imperfection implies evolution, not a Creator—makes sense only if you reject the doctrine of the Fall. The Bible teaches that God created this world as "very good" (Gen. 1:31), but it subsequently fell into corruption and decay (Gen. 3:17–18, Rom. 8:19–22). Gould makes the error of looking at the present world and assuming that this is exactly what God created.

Gould is correct in assuming that imperfection can be evidence of random processes (i.e., mutations) but he limits the possibilities merely to that option. A perfect world that now "groans in travail" (Rom. 8:22) will also show a marked degree of imperfection. The creation was subjected to futility due to man's sin. The god Gould destroys is of his own creation. The true God—transcendent and eternal—cannot be destroyed by anything in the universe, much less by the arguments of a single scientist.

Further, Gould's god is not allowed to function through process. We know that the fertilization structures of orchids were divinely created; even so, it is possible that these have varied somewhat from their original design. The concept of God is not invalidated by events of natural selection or even speciation.

A good example is the wingless beetle Darwin discovered on Madeira Island in the Pacific. This beetle undoubtably once had wings that were lost by a degenerative mutation. In this case, the mutation was an advantage because Madeira is very windy. Beetles with wings get blown off the island and drown. Beetles with no wings stay on the ground and live. However, we must point out that even though this degenerative mutation was good for the beetles, it was still an instance of decay. Animals may lose certain organs to adapt to their surroundings, but we do not see them growing new ones.

When Gould argues (along with Darwin) that the useless, odd, peculiar, etc. are evolutionary remnants of history, he is question-begging. By the very use of the word remnant, he assumes that adaptations like the Panda's thumb are simply by-products of the trial and error learning process of evolution. The fallacy here is that anything odd and peculiar appears to Gould as a remnant of history when in reality, an odd phenomenon may be a result of the Fall. A peculiarity of nature may represent the wisdom of God that we cannot grasp from our finite viewpoint. Had we His view of things, it might not seem peculiar at all. Oddly enough, Gould, who never claimed personal knowledge of God, *does* claim to have a phenomenal understanding of His ways by stating He would never create, say, a Panda's thumb. Few theologians would venture such imprudence of predicting what God will or will not do.

Gould is also incorrect when he implies that cruelty in nature argues against a benevolent God. Gould's citation of Buckland is of no help in this regard. Buckland sought to find God's benevolence in nature's cruelty. Although the creation shows His power and majesty (Rom. 1), it predominantly reveals the effects of sin. Cruelty

in nature does not argue against God. Instead, it argues for the Fall. We err if we do not place the Fall as a real event in history.

One of the most interesting comments by Gould is his statement that perfection argues for both creation and evolution. While we can easily see how an omniscient, omnipotent creator can account for perfection, how can random mutations (biological mistakes) coupled with natural selection achieve perfection? This is, at best, difficult to demonstrate.

What is even more interesting is that Gould invests the process of nature with Divine attributes. Not only does nature evidence imperfection, but it also produces perfection indistinguishable from what one would expect from a Creator. Gould finds no difficulty in having his evolutionary cake and eating it too.

The recognition of beauty and order indicating intelligent design is inherent within man. Carl Sagan in his book *Cosmos* uses the same thought process to explain why many believed intelligent life might be present on Mars. From a distance, the geometrical patterns of the canals on Mars suggested they may have been constructed by intelligent beings. But as we got closer and our focus got sharper, what appeared to be patterns faded into randomness. By contrast, as one draws closer to earth from space, the ambiguous outline of continents gives way to precise geometrical patterns of roads, highways, farmlands, etc. We see squares, triangles, straight lines, and circles. As Sagan says, "These are, in fact, the engineering artifacts of intelligent beings."[7] Likewise, the closer we look at living systems, the clearer the indication of intelligent design: not only geometrical patterns but informational codes that are contained in DNA.

God and Man at Harvard

It seems that this Harvard professor has created a god with whom he is comfortable. In the Arkansas creation trial, Gould said that "evolutionary theory functions either with or without a creator, so long as the creator works by natural laws." In other words, god can exist if He doesn't use miracles.

The straw god of Stephen Gould is really no god at all; only nature with a capital "N." There is no way to distinguish between the two. Gould first creates a god that can easily be destroyed. Then Gould creates one he can easily live with. In essence, Gould will not allow God to be God. The god of Stephen Jay Gould is not the God of the Bible but rather a poor facsimile from Gould's fertile imagination.

The God of the Bible exercises sovereign choice. In fact, as created beings we can investigate His world and take joy in the intricacies of His work, but we really do not have the right nor the wisdom to question God's judgment in life or in creation.

> But who are you, O man, to talk back to God? "Shall what is formed say to him who formed it, 'Why did you make me like this?' " Does not the potter have the right to make out of the same lump of clay some pottery for noble purposes and some for common use? Romans 9:20–21

As Christians we often become frustrated at the evolutionist's lack of recognition of design in nature. It appears so obvious to us; why don't they see it as well? We must remember that our perspective is different. The purely naturalistic evolutionist does not see God in nature because he has rejected Him. His world view is different. All is matter and energy. There is neither need nor room for God in his universe. The Christian world view on the other hand recognizes that "For in Him all things were created, both in the heavens and on earth, visible and invisible, whether thrones or dominions or rulers or authorities—all things have been created through Him and for Him" (Col. 1:16).

[1]Stephen Jay Gould, "Organic Wisdom, or Why Should a Fly Eat Its Mother From Inside" in *Ever Since Darwin: Reflections in Natural History* (New York, W. W. Norton, 1977), p. 91.
[2]Gould, "The Problem of Perfection, or How Can a Clam Mount a Fish on Its Rear End?" in *Darwin*, p. 104.
[3]Gould, "The Panda's Thumb," in *The Panda's Thumb: More Reflections in Natural History* (New York: W. W. Norton, 1980), p. 25.
[4]Gould, "Senseless Signs of History," in *Panda's Thumb*, p. 28.
[5]*Ibid.*
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"Christian" Psychology: Implications from Philosophy of Science

Two Perspectives

Christian psychologists continue to wrestle with the issue of a "Christian" psychology. If it exists, how is it different from the rest of psychology? While there are several approaches to the integration of psychology and Christianity (Carter & Narramore, 1979), there are two basic answers to this question: "Christian psychology is unique," or "Christian psychologists do the same work as non-Christian psychologists." Two schools of thought have emerged in support of these differing responses. The first school believes that Christian counseling/psychology is totally different because it is based on a Christian world view. This world view supposedly can guide research and practice to unique conclusions and techniques (Collins, 1977; Crabb, 1977; Kotesky, 1980). The second school's thought is derived from the view that since all truth belongs to God, and because truth is one, any system of psychotherapy can be used effectively. Therefore, Christians might not differ in research and practice from non-Christians (Tournier, 1968; Jeeves, 1976). Because both views seem to accurately reflect a part of reality, to answer the "Christian" psychology question with a simple affirmative or negative reply is problematic. Intuitively, the Christian counselor senses that what he/she does differs from "secular" counseling because of an openly-held biblically-based value system and because of frequent use of spiritual resources. Yet Christians also realize that the secular-sacred split is a false dichotomy (Bonhoeffer, 1955). The Christian researcher-practitioner sees that what he/she does in many respects is not different from what is being done by his/her non-Christian colleague.

The Real Issue

The resolution of this contradiction can be attempted only by examining how Christianity relates to the whole of science. In principle, the integration of psychology and Christianity need not differ substantially from how other sciences integrate Christian thought and belief. In other words, is there such a thing as a Christian science vs. a non-Christian science? In contemplating this question, we find ourselves making basic inquiries into the nature of truth, creation, and discovery. What is truth and how do we obtain it? What kinds of truth exist? Is Christian truth different from other types of truth? What is the nature of reality: of the Creator and of the creation? Is reality describable?

It is interesting to observe that Christians do not always agree upon whether, from a biblical point of view, scientific truth is

"transient or enduring" (Wonderly, 1981). Perhaps these points of view are not mutually exclusive, but they do raise our awareness of the complexity of the basic question: is there a Christian science/psychology?

A Proposed Model

A system/model is needed whereby scientists can adequately describe reality, truth and the nature of reality-truth discovery. Such a model outlines the activities of science, and hence the activities of psychology. Only then can we ask how and where Christian psychology may or may not be unique. This model sketches answers to previously raised questions about truth, reality and discovery.

In Figure 1 the outermost ring of the circle is made to represent all truth, truth being defined as an accurate description of what is real. Truth is the object of our search, whether we are researching phenomena, helping a client towards resolution of a complex problem, or trying to understand and know God.

Note, however, that we are dealing with two categories of reality: the reality of the creator and the reality of creation. The innermost ring of the circle, God, represents reality that is not in flux. Jesus Christ (who is God) is "the same yesterday, today and forever" (Heb. 13:8). God said, "I am what I am" (Ex. 3:14) not "I am what I may become" or "I am what you think I am."

The second ring of the circle includes all of God's creation, a reality *much of which* is dynamic and in flux. While stable laws may be in operation, the substance of reality or the way we choose to view reality can be totally dynamic and changing or fairly static. The more dynamic the part of creation we choose to study, the harder truth in any absolute sense is to obtain. This aspect of reality makes psychology an especially challenging science. Likewise, physicists experience descriptions of atomic realities as problematic. Bohr (1934) continually makes comparisons between psychology and physics and their shared problems concerning accurate descriptions of reality.

Philosophical Positions and Presuppositions

This system and model calls for a moderate position on many philosophical continua. Reality is not totally dependent upon the knower because this leads to an undesirable subjectivism. Yet neither is it totally dependent upon the known because the knower is a part of reality. Reality is therefore personal as well as impersonal. While sensory data are not totally authoritative, neither are they totally unreliable. Science must deal not only with empirical data, but also with value systems. Both induction and deduction are valuable ways to discovery. The ultimate goal of science is to describe, to understand, and to explain reality, in addition to making predictions about it (Shontz, 1982).

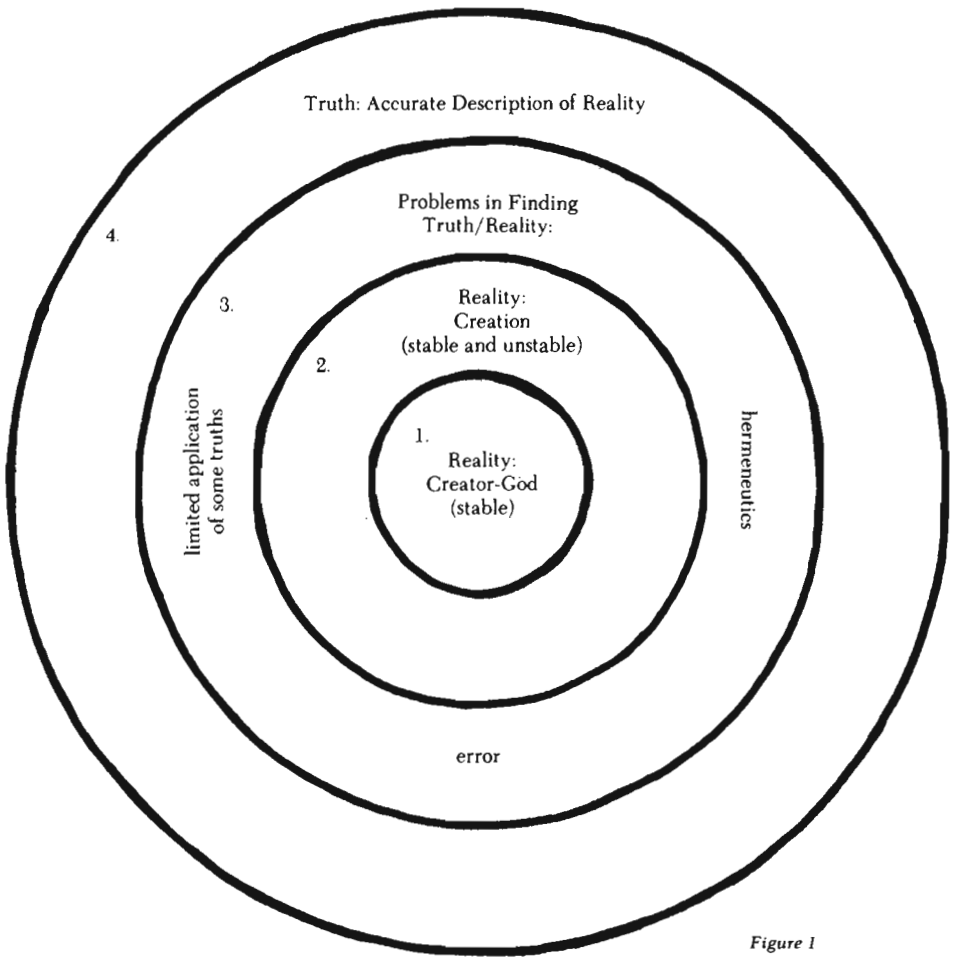

Figure 1

An underlying presupposition of this scientific model is that absolute truth exists as it originates from God, who does not change. Other truths exist that are not absolute but are nevertheless true in their given contexts. This belief is posited because of a faith in Jesus Christ, whom we believe to be the Son of God by virtue of His physical and historical resurrection, who said that truth exists. Secondly, the existence of an absolute brings meaning and sense to our world, a meaning that is noticeably absent with a totally relativistic framework.

In summary, our model encompasses the belief that scientists can know truly, but not exhaustively (Schaeffer, 1968; Bube, 1971).

Difficulties Examined

The third ring of the circle describes problems that exist for any searcher of truths, for any scientist. All of these categories support the belief that we cannot know exhaustively. The "hermeneutic problem" involves presuppositions that individuals make to organize the data they observe as well as interpretations they subsequently make about that data. Truth is difficult to agree upon when logical evidence exists for two opposing presuppositions, or when hermeneutic principles lead to different understandings of the same "hard" data. The "error problem" involves more than just correctable errors. A chosen methodology may be limited and improper and lead to an incorrect conclusion that is not easily detected. Human deception and dishonesty is a form of "error" all science has been plagued with since its beginning! One must also realize that sensory data are not totally reliable—yet another source of error. Finally, the search for truths is complicated by the "limited application" problem. This involves the incomplete nature of many of our discoveries, as well as the relative nature or limited scope of some "truths."

In addition to the various roadblocks to truth as outlined in the third ring, another complicating factor is the nature of creation. Not all of creation is stable and unchanging reality. Psychological truths depend upon a psychic reality that is extremely dynamic and subject to continual change. Many other aspects of creation are not static. Therefore, even though the Christian scientist believes in the existence of truth and in God as the source of truth, there are factors which tend to cloud the search and make it a complex task.

Is There a "Christian" Psychology?

The problems discussed in the previous section exist for Christians and non-Christians alike. This realization sheds light on the dilemma of "Christian" psychology. Insofar as hermeneutical guidelines and biblical presuppositions may guide Christians to "givens" that may be contrary to the "givens" of the non-Christian, a "Christian" psychology may lay claim to uniqueness. Yet this is not always the case. Anytime similar presuppositions and values are maintained, Christian psychologists/researchers operate similarly to non-Christian colleagues. Theories often overlap because all are looking at the same creation. Even behavioristic psychologists often offer solutions that are remarkably close to Christian principles. (For example, shaping the behavior of a child with positive and negative reinforcements.)

Interestingly, Christian psychologists often disagree with one another in the same way that non-Christians disagree. For instance, Christians may start with the premise that the Bible contains special revelation from God and then make different interpretations of this special revelation. Different conclusions may be drawn by all those who search and research because no one can escape the problems of the third ring and a reality that is often in flux.

These problems are not new to science. They need not be considered problems unique to the formulation of a "Christian" psychology. The answer to our posed quesion is that sometimes "Christian" psychology will be different from "secular" psychology and sometimes it will not, depending upon the presuppositions involved in the current search or issue.

The biblical presuppositions that deal with human nature are indeed often at odds with the presuppositions of non-Christians. Yet psychology as a science seems totally divided on almost every basic issue: free will vs. determinism, reductionism vs. holism, naturalism vs. supernaturalism. The nature of man, the mind-body problem and the problem of induction are live issues in current psychology (Royce, 1982): not all non-Christian psychologists are deterministic, reductionistic, and naturalistic in their presuppositions. A major problem of many conservative evangelical writers who evaluate psychology is a tendency to presume all non-Christian psychologists hold world views exclusively opposite to biblical positions. This overgeneralization is not an accurate assessment of psychology today.

Problems with the Inner Ring

While all psychologists/scientists look at the same creation (whether they see it as dynamic or stable), not all accept the existence of the innermost ring. Some reject both the notion of God and of an ultimate reality that is stable and unchanging. When this is the case, the possibility of knowing truth truly is also in question. Kuhn (1970, p. 170) in his discussion of scientific revolutions avers that "we may . . . have to relinquish the notion . . . that changes of paradigms carry scientists and those who learn from them closer and closer to the truth." Many scientists, whether they believe in God or not, yet maintain that an inner ring of absolute truth does exist. When the inner ring is intact, science continues to progress toward a goal. Removal of the inner ring means the removal of an absolute that philosophically must lead to either nihilistic lack of meaning or to existentially "created" meanings. If science removes the inner ring, it converges upon a shared illusion rather than upon anything that can be described as true.

Conclusion

Because of the complex nature of reality and because of the difficulties encountered in trying to describe it, Christians probably will not develop a psychology that is any more unified than "secular" psychology. Christian psychologists sometimes will differ from their non-Christian colleagues, and sometimes they will not. This is also true for science in general.

Yet this situation hardly need be framed as one of despair. Such a model for science (and for "Christian" psychology) calls on Christians to make more room for exploration and for each other. It calls Christians in science to be open-minded and flexible and to concentrate on understanding before judging, although not at the expense of laxity in identifying and evaluating presuppositions. Scientists and psychologists should not give up in the search for ultimate truth and other truths. We have faith that truth exists, based on reasonable evidences and on Jesus who said, "I am the way, the truth, and the life" (John 14:6).

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When War is Undertaken in Obedience to God: Just War Theory and the 1980's

General Omar Bradley purportedly once said: "Ours is a world of nuclear giants and ethical infants. We know more about killing than we know about living." I believe he was correct in his assessment, and I think it is time that we begin to seek ways to redress the current imbalance, and speak to the life and death issues of disarmament and arms control.

There are at least three crucial questions for our consideration. (1) When can war be undertaken in obedience to God? (2) Using a Just War framework, we need to consider limitations, agreements, and our perceptions of the Soviet Union (3) It is mandatory that we evaluate the cost of defense, again from the perspective of a Christian who, working within the Just War tradition, believes it needs to be radically re-interpreted for the 1980's.

Augustine's Just War Theory

"When war is undertaken in obedience to God, who would rebuke, or humble, or crush the pride of man, it must be allowed to be a righteous war."[1] Augustine permits war only if it is pursued as a command from God. He maintains that a state can, on its own decision, wage righteous or "just" wars.

Augustine's idea of war is basically a negative one: war is misery. Augustine had an intense hatred for war and a strong dislike for those who believed that campaigns and military victories were acts of glory. Even with this substantial distaste for war and the machines of war, Augustine rejected pacifism and antimilitarism. He claimed that wars would be fought as long as man in his fallenness is driven by selfish desires. For Augustine, it is erroneous to think that a time will come when all men will finally and forever beat their swords into ploughshares. To quote the wise church father, "Whoever hopes for this so great good (i.e., permanent peace) in this world, and on this earth, his wisdom is but folly."[2]

In order to articulate his Christian views, Augustine developed what we call today, "Just War Theory." For him, a just war is undertaken when a transgressor state has overstepped its bounds and broken the laws of temporal justice. As Augustine states, "Those wars are normally called just which avenge injuries."[3] It is the duty of another state or group of states to impose punishment on the aggressor state.

This punishment in the form of just war should, however, take place only after all other methods of persuasion have failed to stop or slow the unruly state's course of action. According to Augustine, the reason a just war is fought is not to gain more territory, possessions, or glory, but rather to punish the wrong-doer and to have them make restitution for their actions.

Augustine lays out certain definitive criteria for a just war, whether a war of defensive or offensive nature. A defensive war is always a just war since it aims at protecting land, lives and property; a lesser evil (war) is allowed so as to prevent a greater evil (conquest by an aggressor). Augustine further allows certain offensive wars to be just if they are fought against a state that has committed wrongs and refuses to make reparations, or if a state has taken possession of land illegally and refuses to return it.

Good rulers wage only just wars. If the state is a Christian state and observes Christian principles in its wars with the intention of punishing wrongdoing, peace with other states is more easily gained and kept. Peace should be the end sought for in every war, not glory, revenge or conquest. In their waging of just wars, rulers strive to attain peace, punishing the evil-doers in the process while not being inhumane or excessive. The interests of the conquered must be considered as well as those of the conquerors. (As an aside here, I would insist that the United States is not a Christian nation at present, nor in its founding. America has only a civil religion based on a civil theology which proclaims the sovereignty of man.)

Augustine goes on to remind the soldier that his strength comes from God so he should not use his body against God. He states, "Peace should be the object of your desire; war should be waged only as a necessity, ... war is waged in order that peace may be obtained."[4]

The role that the soldier plays in the just war is therefore an innocent one. He is not responsible for the death he deals; he is commanded to deal death and must obey the law. The soldier's position requires him to be obedient and he can be punished for neglecting to do what he has been ordered to do. Outside of orders it is wrong for a soldier to kill, but as soon as the order (in a just war) is given it is wrong not to kill. According to Ausustine there is no room for disobedience on the part of a soldier's conscience once he has been asked to perform a just deed. Augustine states,

> And, accordingly, they who have waged war in obedience to the divine command, or in conformity with His laws, have represented in their persons the public justice or the wisdom of government, and in this capacity have put to death wicked men; such persons have by no means violated the commandment, 'Thou shalt not kill.'[5]

Action taken against "unjust" states is for the good of those states, as well as for the good of other states. If these states are punished by war, they will serve as an example to all states like them who might change their policies and act according to God's standards of justice. Augustine holds that the state engaged in a just war is acting lovingly and thus fulfilling Christ's bidding.

Traditional Christian "Just War Theory," which as we see has clear Augustinian roots, can be summarized in these seven conditions. Wars are just when:

1. All means of non-military settlement are exhausted;
2. the harm done is seen as less than the offense to be corrected;
3. the resulting order is to be more stable than the previous one;
4. the aims of war are defined so that the enemy knows on what terms he may have peace;
5. there is sufficient strength so that there is a definite probability of victory;
6. the cause is not self-aggrandizement;
7. a hostility is undertaken by a legitimate government.

Once a conflict begins, Just War teaching applies two other criteria:

1. The principle of proportionality; all warlike actions must be commensurate with their consequences; and
2. the immunity of noncombatants.

It has been suggested by many "realist" commentators on international relations,[7] and less directly by numerous politicians, that the "Just War" criteria postulate a world that does not exist. If the world is truly a jungle of secrecy, malfeasance, brutality and deception—the criteria may be quaintly irrelevant. But where does that leave us? I believe that Christians have something to say about the reality we experience because we have a special view on the world—who made it, sustains it, preserves it, and what justice is necessary to maintain life in it. A Christian perspective, a "Just War" perspective is, I suggest, timely and different from the liberal notion of individual or national self-interest, the Conservative argument for a balance of power, the Marxist claim of class warfare, and certainly, from the Fascist glorification of the nation.

Moral choice is woven into the very fabric of foreign and strategic policy making and choices must, and always are, evaluated in terms of some ultimate principles. The question is, which principles?

Limiting War Against an Unsure Enemy

The Soviet Union is a global power whose central geostrategic position on the Eurasian land mass, growing capability to project military power, and its readiness to exploit regional conflicts has made its policies crucial determinants of war and peace. The Soviet perspective on the world has two themes: a "Russian" theme as a nation, with a long history of goals and conflicts before communism, and a "Communist" theme based on ideology—a rigid system of Marxist-Leninist beliefs. Certainly, the revolution of 1917 was motivated more by Communist ideology than by Russian nationalism, but since Stalin's *Socialism in One Country*, there has been an appreciable renewed emphasis on national interests. To come even close to understanding the Soviet view of international relations and arms limitations, it is necessary to intertwine the basic tenents of Communist ideology with the historical interests of the Russian nations.[8]

As the noted journalist Harrison Salisbury suggests,

> Much of Soviet present day behavior is a conditioned reflex to a 700 year old catastrophe—the Mongol invasion. After the Mongols, Russia was beaten by the Turks, Poles, Lithuanians, Swedes, English, French and Japanese. These centuries of struggle have caused one Russian ruler after another to value guns above butter and explain why this world power which rockets cosmonauts into space cannot provide enough eggs and milk for its people.[9]

Avoiding the preconceived, and ever too common traps, and learning from the Soviet legacy, four propositions can be gleaned from the Kremlin's long-term record:

1. The Soviet leadership believes in the utility of force to preserve and promote its interests, internally and externally.
2. The Kremlin is wedded to maintaining its own imperial system.
3. The Soviet leaders have always respected the honest use of power, and have distained American weakness and inconsistency.
4. The Soviets want peace but have a different view of stability, with different values from our own. This feeds a rivalry based on perceived fear of the other.

Added to this is the view expressed by a recent International Institute of Strategic Studies publication which suggests:

> The Soviet Union is weak. Indeed it might well be argued that her military strength is a function of her weakness in other spheres . . . Since she can hardly play a forceful part in a world system in which economic and political considerations interact constantly, her political influence is, in fact, restricted.

In other words, although dangerous, the Soviet Union is not 20 feet tall.[10] Negotiating with the Soviets has been, and is therefore possible, once you know with whom you are dealing. In fact, the exact moment when the bipolarity of the cold war began to change into a state labelled in the west as "detente" is difficult to pinpoint.[11] The Russian word for the process is *raziadka*, or "unwinding." Most of those who watched dated it from 1957, when the Soviet Union tested its first ICBM, and thereby greatly enhanced its capacity to strike the U.S. It was clearly certain after the 1962 Cuban missile crisis when both parties realized how close they had come to stepping over the brink, and signed a limited test ban treaty in 1963.

The change, which implies a degree of trust, came about because the superpowers found ways for increased cooperation; the rival blocs loosened; many nations appeared to be non-aligned with either superpower; and, because of the awareness of the danger of confrontations—they were as Oppenheimer put it, "two scorpions in a bottle." In short, both had every reason to avoid stinging each other. The choice was co-existence or non-existence; as Eisenhower said "there is *no* alternative to peace."

The arms race led by the 1960's to fruitful negotiation, the dramatic result being the ratified SALT I and unratified SALT II treaties. Has it worked? I think there are mixed blessings from detente.[12] The benefits include relative peace between the superpowers; an atmosphere for frequent consultation and negotiation; a number of treaties and agreements; a German settlement; increased trade and probably the resumption of American relations with China. On the other side, the arms talks did not go far enough, and a new cycle of terror was unleashed. Human rights violations, Soviet and American adventurism, tensions in well-known hot spots, Cuban troops as surrogates, not to mention Afghanistan, and now Poland, impinged and eventually overcame detente.

Overall the trend toward cooperation, which I believe must be revived, away from intense hostility and confrontation, is to be applauded. Detente did not mean *entente*, complete friendship and harmony; it meant a lower level of tension, not the absence of tension. Surely it is better that the superpower rivalry continue in ice hockey than in strategic weapons.

I agree with W. Averell Harriman when he decrys those who contend that any relaxation of tensions must benefit the Russians, to our disadvantage. "It seems to me," he said, "we have no choice. In this nuclear age, war is unthinkable. Our interest is bound to be served by relieving tensions as much as we can, by working for peaceful, competitive coexistence."[13]

We must continually remember that our tensions occur within the constraints of a mutual desire to avoid a nuclear clash. The purpose of any detente, which itself has now become a dirty word, is to make my—your—their—our lives in this world safer. We live in a highly combustible situation. We have enough deployment to blow each other up hundreds of times over. Is that necessary?[14]

As Christians, using those very "Just War" criteria I have elaborated, we must assess this question carefully. I do not see how it is possible to adapt classical Augustinian categories to fit present reality. There is no just nuclear war. Look at each point, one by one, and you will be hard pressed to construct a plausible, coherent moral argument for even a limited exchange of nuclear weapons. I have tried, and cannot!

Here we must remember that sin is not only an individual calamity but is also attributable to nations as a whole.[15] What the biblical language refers to as powers and principalities also experience and commit sin. Nations "live in darkness." As former Senator William Fullbright said, "Nations struggle not only with each other but also with their perceptions of each other." Misperceptions are

not easily changed.[16] Only God sees all. There are no final answers here on earth.

Perhaps the prospects for Soviet-American relations are best summarized in a fable I heard recently. It seems Hua Go Feng, Reagan and Brezhnev were talking to God. Hua asked, "When will China become a modern industrialized nation, a superpower?" "In fifty years," God said, and Hua started to cry, because he would not be alive to see that glorious day. "When," asked Reagan "will the U.S. become independent in energy and again be recognized as the undisputed leader of the entire world?" "In fifty years," answered God, and Reagan started to cry, because he knew he would not live to see that day. Then Brezhnev asked God, "When will the Soviet Union and United States be friendly, working together in a spirit of cooperation and mutual recognition of each other in a way designed to strengthen international peace?" . . . and God started to cry.

How did we get ourselves into this dangerous mess? The winner of the Albert Einstein Peace Prize, long-time expert on East-West relations, George Kennan answers,

> It is primarily the inner momentum, the independent momentum, of the weapons race itself—the compulsions that arise and take charge of great powers when they enter upon a competition with each other in the building up of major armaments of any sort.[17]

Kennan has therefore called the President, after consulting Congress, to propose to the Soviet government an immediate across-the-boards reduction by 50 percent of nuclear arsenals on both sides.

The Russian-American cleavage is growing. Many believe that detente has in fact lapsed back into an unrestricted cold war. In my view, this trend must be turned around. The stakes are too high. History has proven that arms races lead inevitably to war. In more than one study, researchers have demonstrated that arms races are either a prelude to war, or a significant cause of war.[18]

What Constitutes Enough?

It is unfortunate that so many people make a facile connection between security and armaments. Certainly a level of military preparedness is necessary for survival in the face of powerful adversaries. The question is, what constitutes enough?

The 150 governments of the world spent over $450 billion last year on armaments. The U.S. was number one, the Soviet Union not far behind. "Mutually Assured Destruction" (appropriately MAD) does more than deter both the Superpowers from initiating a nuclear war. Why do we go ahead with overkill—the U.S. arsenal now contains approximately 31,000 nuclear bombs, 22,000 tactical nuclear weapons, and 9,000 strategic devices? Under deterrent philosophy those numbers just do not make sense. The very existence of so many weapons implies a more sinister doctrine—Counterforce.

In a "Just War" framework we do not allow the state to prevent murder by threatening to kill the family and friends of every murderer. But we allow the corollary strategic policy. Is this not immoral? Immoral in the threat itself? Paul Ramsey puts the case very well: "Whatever is wrong to do is wrong to threaten, if the latter means 'mean to do.' "[19] We must condemn the commitment to murder as well as the physical and economic harm it does to our societies. When we "threaten evil in order not to do it,"[20] because doing it would be so terrible that the threat seems almost defensible, something is badly wrong.

My argument, realizing the inapplicability of Christian "Just War" theory to current nuclear arms deployment on the basis of proportionality and harm to noncombatants, is to ask what constitutes real material security? Has the defense budget made us secure? Would a higher defense budget make us more secure?

Hosea, an old-fashioned prophet, once warned that those who place their trust in chariots and in their warriors would be razed.[21] More recently, the Brandt Commission echoed this saying that "More arms do not make mankind safer, only poorer."[22] The Presidential Commission on World Hunger also suggested that "military security is ultimately useless in the absence of the global security that only coordinated international progress toward social justice can bring."[23]

In a sense, the guarantee of our safety has become the final criteria of what we as a nation have chosen to do. We have become dependent on the technological means by which we think we can guarantee our security. These means, of great expenditure in economic terms, determine what we have to do. Only one item is sacred in the budgetary process.

This is very similar to what the Gospel calls idolatry. Idolatry is having a final trust in what you have made with your own hands. But idols do not lead to happiness; rather human beings become slaves when they place trust only in the security of their weapons.

A religious trust in weapons means that other societal needs are relegated a lower priority. We continue to justify excessive defense spending even, as in the case of nuclear weapons, they are not usable at all. In terms of justice, these means cannot possibly have a justifiable use. Nevertheless, we continue to want them in larger and larger supplies.

Jesus once said, "If you want to maintain your life at all costs, you will lose it. But if you are prepared to lose your life—because you give prevalence to justice and stewardship—you will find it." It is altogether possible that we have lost that final trust in God by trusting in our weapons systems.

The statistical reality is mind-boggling:

$1 million = 1 helicopter or 66 new medical clinics;
$9 million = 1 A 6-E Intruder plane or 257 low income apartments;
$5 billion = C-5 A program or the elimination of hunger in the U.S.;
$11.4 billion = B-1 bomber program or 3 equipped schools with 1000 teachers in each of 500 communities.[24]

and, the MX missile program is the most expensive item ever in human history.

For my money, and because of my faith confirmed by reality, peace depends on arms limitations that can lead to substantial disarmament. Limitations: not to perform certain actions; not to keep more than a fixed amount or no weapons of a given kind; not to use certain weapons, or not to use them save in certain ways or under certain conditions—and preeminently on the settlement of political issues.

Within the "Just War" framework, arms agreements may be said to: decrease the probability of war; limit damage from war; inhibit the start of an accidental or unwanted, unintentional war; and most importantly, in the present context, to reduce the cost of providing so-called "security."[25] In the final analysis, weapons are not very productive; we cannot use the ones we presently have, and we cannot eat them either.

It is useful to remind ourselves of the not so well known, yet very candid, farewell speech of President Carter. As Eisenhower had done

20 years earlier, he addressed himself foremost to the threat of nuclear destruction and said, "the danger is becoming greater," and "it may only be a matter of time before madness, desperation, greed or miscalculation lets loose that terrible force." He noted that a nuclear war in the 1980's would last only half a day. Yet "more destructive power than in all of World War II would be unleashed every second." And more people—most of them civilians—would be "killed in the first few hours than in all the wars of history put together."

Mr. Carter concluded: "The survivors, if any, would live in despair amid the poisoned ruins of a civilization that had committed suicide."[26] Justice, "Just War," demands that we avoid nuclear war so that we may obey God. The root of the problem goes beyond the weapons themselves, and demands that we ask what religious world views are behind the insane arms build-up and our conception of national security.

[1]Henry Paolucci, ed., *The Political Writings of St. Augustine*. South Bend, Indiana: Gateway Editions, Ltd., 1962, p. 165.
[2]St. Augustine, *City of God*. Trans. Gerald G. Walsh, S.J., New York: Image Books, 1958, Book 17, chapter 13.
[3]St. Augustine, *Corpus Scriptorum Ecclesiasticorum Latinorum*, XXVIII.
[4]St. Augustine, *Epistula* CLXXXIX, 6.
[5]St. Augustine, *City of God*. Book 1, chapter 21.
[6]See Paul Ramsey, *The Just War: Force and Political Responsibility*. 1968; *War and the Christian Conscience: How Shall Modern War be Justly Conducted?* 1961; Martin A. Kaplan, ed., *Strategic Thinking and Its Moral Implications*. 1963; Kenneth Dougherty, *General Ethics: An Introduction to the Basic Principles of the Moral Life According to St. Thomas Aquinas*. 1959; William Clancey, ed., *The Moral Dilemma of Nuclear Weapons*. 1961; and John C. Bennett, ed., *Nuclear Weapons and the Conflict of Conscience*. 1962.
[7]The list is too long to mention here, but includes the likes of Thucydides, Hobbes, Clausewitz, Morgenthau, Kissinger, Hoffman and others.
[8]The classical work is James H. Billington, *The Icon and the Axe: An Interpretive History of Russian Culture*. New York: Vintage Books, 1966.
[9]Harrison Salisbury, *Russia*. New York: Atheneum, 1974, pgs. 7–8.
[10]Philip Windsor, a paper of the International Institute of Strategic Studies, Oxford, England, September 1978.
[11]See Paul Y. Hammond, *Cold War and Detente*. New York: Harcourt, Brace and Jovanovich, Inc., 1975; and Adam B. Ulam, *The Rivals: America and Russia since World War II*. New York: Viking Press, 1971.
[12]This topic is the theme of Fred W. Neal, ed., *Detente or Debacle*. New York: W.W. Norton and Co., 1979.
[13]W. Averill Harriman, quoted in *The New York Times*, September 24, 1980, p. 13.
[14]A good answer to this question can be found in Richard Barnet's, *Real Security: Restoring American Power in a Dangerous Decade*. New York: Touchstone, 1981.
[15]For illumination see William Stringfellow, *Conscience and Obedience*. Waco, TX: Word Books, 1977.
[16]The conclusion of Richard Barnet in *The Giants: Russia and America*. New York: Touchstone, 1977.
[17]George Kennan, "To Check the Danger of Nuclear Arms," *The Christian Science Monitor*. June 1, 1981, p. 23.
[18]Samuel P. Huntington, "Arms Races: Prerequisites and Results," in Robert J. Art and Kenneth Waltz, eds., *The Use of Force*. Boston: Little, Brown, 1971. For another view see Brownlee Hayden, *The Great Statistics of War Hoax*. Santa Monica, CA: Rand Corp., 1962.
[19]Paul Ramsey, "A Political Ethics Context for Strategic Thinking," in Morton Kaplan, ed., *Strategic Thinking and Its Moral Implications*. Chicago: Univ. of Chicago Press, 1973, p. 134.
[20]Michael Walzer, *Just and UnJust Wars*. New York: Basic Books, 1977, p. 274.
[21]Hosea 10: 13–14.
[22]*North-South: A Program for Survival*. The Independent Commission on International Development Issues, Boston: MIT Press, 1980.
[23]Quoted in "Hunger and Global Security," New York: Bread for the World, 1980.
[24]See Ruth Leger Sivard, *World Military and Social Expenditures 1980*. Leesburg, VA: World Priorities, 1980.
[25]Two helpful essays are Lester R. Brown, "Redefining National Security," Washington, DC: Worldwatch Institute, 1977; and Robert C. Johansen, *Toward A Dependable Peace*. New York: Institute for World Order, 1978.
[26]President Carter as quoted in *The Christian Science Monitor*, January 22, 1981, p. 22.

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Haydn's Creation *quotes the Bible saying, "The heavens are telling the wonders of God." I have reached the conscious conclusion that somehow it's a matter of faith and trust in God that discovering the laws of nature is kind of an act of worship, provided it reveals a little bit more of what the Creator put there. It's an act of worship to discover the wonders that God has put in the universe for us to contemplate. It's just so marvelous to know the things we never suspected were there. As someone says, the world is not only more wonderful than we know, it's more wonderful than we can imagine.*

Arthur Schawlow

In interview, "Going for the Gaps," in the Stanford Magazine, *Fall, 1982. Professor Schawlow, Department of Physics of Stanford University, was awarded the Nobel Prize in Physics in 1981 for his contributions to laser spectroscopy.*

THE GROUND AND GRAMMAR OF THEOLOGY

by Thomas Forsyth Torrance, University Press of Virginia (1980). $9.95. 180 pp.

Some books have a way of touching off an inner debate between you and the author. This recent book by the distinguished professor emeritus of the University of Edinburgh, causes such a stir within me. I would like to share that dialogue in the form of a letter.

Dear Dr. Torrance,

I know that readers of your book will appreciate both its pertinent subject matter (the development of a unitary/realistic outlook toward the world) and the fortitude with which you press the importance of sound Christian doctrine. This book is another important contribution in this transitional period when science and theology are coming to recognize each other as partners in their common exploration of the meaning and structure of the universe.

I expect you will also find a strong consensus concerning the negative effects dualistic theories have had upon Christian theology and scientific theories. Both have suffered, as you so ably document, by being wedded to a Greek-Western culture, characterized by a dualistic philosophy and cosmology. You trace dualistic tendencies from Plato and Aristotle through Kant and Descartes; tendencies which show up again and again in the hiatus between the physical and spiritual, experience and conception, truths of reasons and truths of history, *Historie* and *Geschichte*, being and form, man's life as part of the physical cosmos and his life as a moral person. You have many supporters when you assert right from the beginning:

> It is in and through the universe of space and time that God has revealed himself to us in modes of rationality that he has conferred upon creation . . . and it is in and through the same universe of space and time that theology makes its disciplined response to God's self revelation (p. 1)

Another thesis of your book is the new epistemology which is emerging within science; an epistemology which seems to be in harmony with Christian doctrine. This contemporary epistemology has four traits, according to you: (1) an ontology which unites the inner and the outer, subject and object, (2) the replacement of atomistic/mechanical models with relational ones, (3) the acceptance of spontaneity and an ordered universe which is open, (4) a movement away from a flat understanding of nature toward one of complexity (depth) and hierarchical levels.

The conclusion you reach is this: We are making the transition from a dualistic outlook to a unitary understanding of the cosmos, and this in turn makes possible a serious inter-disciplinary inquiry by both theology and science (p. 177). I wonder, though, why you do not mention the important contribution of Leslie Dewart. Certainly his book, *The Future of Belief* (1966), and those which followed, were a masterful critique of the Hellenization (dualism) of Western thought and the mandate to forge a new concept of truth that interlocks experience and conception.

You are to be commended for seizing the issue of contingency and incorporating it as part of the new shared epistemology. We remember, for it was not so long ago, the struggle Christian thinkers had with any concept of change, whether it was the changing heavens or the extinction/emergence of a new species. Your positive approach, however, makes me ask if you take seriously enough the consequences of a radically contingent universe, as this issue spills over into its sister issue of relativity. Everything I read leads me to believe we have a considerable way to go before science and theology have a mutual understanding of how to incorporate mutations, probabilities, indeterminacy, spontaneous creation, etc.

I found your chapter on "The Transformation of Natural Theology" most interesting. The contemporary scene reveals a deep rift between natural theology and special revelation—another consequence of our dualistic habits. The various recent attempts to construct a theological anthropology (Berger, Gilkey, Dewart, Moltmann, Lonergan, Tracy, process theologians, etc.) would be legitimate in your eyes in so far as they became "an essential sub-structure and not an independent structure cut off from the living Triune God." You offer us quite a challenge when you reject as intolerable a knowledge of God in two parts, for both theologians and scientists have had difficulty dealing with the Trinity as the ground and grammar of their understanding of the universe.

Throughout your book you stress as a fundamental presupposition the rationality and unity of the cosmos. It is a valid and necessary supposition. My questioning begins when you argue this intelligibility and "coherent singularity" (Jaki) to be "objectively inherent in the universe independent of our perceiving and conceiving of it" (p. 72). It may be inherent but I think you would find objections from both disciplines concerning its *objectivity* apart from the perceiver. I understand and share your dislike of the Kantian dualism between subject and object, experience and faith, but I also accept the

view that all data are to some extent "theory-laden." Perhaps this explains why you do not include as one of your traits of the new epistemology the fundamentally different way science views the observer as a participant in what he observes. It is not only a question whether man as the perceiver *can* extract himself from the givenness of the world, but whether man as the supreme product of the evolution of matter is not *obligated* to discover meaning and purpose in the interaction of subject and object.

The issue at hand is our conception of truth, that is, how we define the relationship of subject and object. I continually wanted you to say more about the interplay between form and being. If you had elaborated on this, your reader would have a clearer picture of how we go about discerning the ground and grammar of the universe.

Finally, I would engage you in dialogue concerning your understanding of how science and theology can work together as partners. We agree there is an imperative to formulate a foundational agreement concerning the rationality and unity (purpose and structure) of the universe. The dilemma that continually confronts me is how there can be mutual cooperation when Christians believe that through special revelation the ultimate purpose of the cosmos has already been disclosed. Scientists are justified in their suspicion that theologians want to sneak in a teleological factor. Although you are careful with your language, I do detect that sense of religious superiority that I believe hurts the partnership. The function of science becomes primarily negative; e.g. peeling away pseudo concepts under which theology has so long been suffocating, or compelling theology to be true to its own foundations. The latter is an important theme of your book since you would like theology to rediscover its own foundations that were laid when the church struggled with dualistic modes of thought in her infant years. But doesn't science also have a positive role in an equal partnership? Don't both disciplines have to acknowledge that neither is queen of human knowledge any longer? I would prefer to see this transitional period as a time when both sciences test their respective truth statements for compatibility, rather than trying to construct a *Weltbild* or a unitary foundation. Are you—are we—willing to confess that real dialogue begins when science and religion recognize their mutual insufficiency to explain and comprehend God's revelation in space and time, because the universe is so complex, time so vast, the possibilities within nature so myriad, human progress so ambivalent, and history so subjective?

I greatly appreciated and enjoyed your book, as I know others will.

Reviewed by Richard J. Coleman, Teaching Minister, Community Church of Durham, Durham, New Hampshire 03824

MYSTICISM AND THE NEW PHYSICS by Michael Talbot. (New York: Bantam Books, 1980) 184 pp + glossary and index. $3.50. ISBN 0-553-11908-7.

Michael Talbot's *Mysticism and the New Physics* continues the tradition of *The Tao of Physics* and *The Dancing Wu Li Masters* in exploring the philosophical and religious implications of contemporary physics. Like these others Talbot emphasizes the connections with Eastern religions, but goes even farther. In the first and second parts of the book he discusses the relationship between consciousness and reality and the structure of space-time respectively. In the third and final part, Talbot draws out the similarities of this new physics with Eastern religion, going so far as to provide mantras for meditation.

Talbot states his conclusions most clearly in his closing chapter, entitled, "The New Cosmology":

1) His *epistemology* is an extremely subjective instrumentalism bordering on that of the existentialists. All scientific concepts and theories are heuristic devices, products of convention a la Thomas Kuhn.

2) This leads Talbot to a metaphysics of extreme idealism. He denies any reality save only consciousness and its "reality structuring" capacity to create world upon world. Consensus alone accounts for the "one reality" we call the physical world. But this is the greatest illusion (*maya*) and with appropriate training men can gain control of their reality structuring consciousness (p. 49) and alter the nature of "reality" at will. In a telling summary of his subjective idealism Talbot says:

> Since the dawn of human consciousness we have taught ourselves to search for the correct cosmic egg [reality construct]. The misunderstanding implicit in this search is that there is only one correct cosmic egg. In the new cosmology, we should learn to accept all cosmic eggs as correct, especially the ones we have chosen for ourselves. When cracks appear in our cosmic egg our normal reaction is to experience a sort of emotional bankruptcy. This is unnecessary. Cracks in our cosmic eggs are not an indication that they are incorrect. The purpose of the game is not to attain the correct cosmic egg but simply to be able to pass from cosmic egg to cosmic egg without experiencing emotional bankruptcy. (p. 169)

3) The *ethical* implications of this new cosmology, like that of the Buddhist Vajrayana yogin, is to avoid emotional bankruptcy and attain Nirvana by neither believing nor disbelieving in any set of rules; "No cosmic egg is better than any other. All values are created by the mind." (p. 169) This is sheer relativism. The justification Talbot cites for this new cosmology is, of course, the new physics.

In Part One the thrust of his argument is that physics has shown us that we cannot isolate the observer from the system and that therefore the "participator" and his consciousness actually shape/create the reality we "investigate." He cites the famous example of Schrödinger's cat to show that contemporary Quantum Mechanics (esp. Heisenberg's Principle) has left us with an indeterministic world that allows us to choose from among the infinite possible world branches of every subatomic event. Unfortunately, (1) he goes too far in drawing metaphysical conclusions from Heisenberg's Principle by prematurely dismissing alternative interpretations (including those of Einstein and the Copenhagen school) which conclude, with more philosophical justification, at most an in-principle conceptual uncertainty and (2) he rules out the *less* subjective alternative solutions to Schrödinger's paradox (Copenhagen wave-function collapse and Wigner's interaction of consciousness and reality) in favor of the Everett-Wheeler theory of possible worlds clearly more amenable to

the subjective idealism and Eastern thought he has already decided to defend. If Talbot were less anxious to defend this view and concerned only to show its similarity to Eastern thought, the use of the new physics would be more unprejudiced and acceptable.

In Part Two Talbot does a good job of describing the inadequacy of language to explain the mysterious nature of matter, time and space. His account of the geometrodynamical theory of space and matter (p. 76f) is good though somewhat short. Following the account of matter and gravity as singularities and curvature in space-time; Talbot goes on to describe the view held by Wheeler that all of the geometrodynamical continuum consists of interconnected wormholes, or mini "black" and "white" holes, a kind of "quantum foam" which like the holographic model of consciousness creates a "superspace" or "quantum interconnectedness" between all points in space. "Because the wormholes connect every point in space with every other point, the universe collapses into a peculiar one-dimensionality" (p. 81). From this Talbot concludes that, "In a universe whose warp and weft is the quantum foam, the fabric of physical reality becomes indistinguishable from the fabric of dream" (p. 81). The point, of course, is to show how both Quantum Mechanics (Part One) and General Relativity (Part Two) lead to the same subjective idealism of Eastern mysticism.

To his credit, Talbot does a good job of showing the similarity of certain speculative implications of certain interpretations of Quantum Mechanics and General Relativity with the cosomological views of Buddhist mysticism. Because the layman must understand the physics before the similarity can be seen, Talbot might have made his accounts of the physics more thorough, like those of Zukav in *The Dancing Wu Li Masters*, and he might have been less hasty to draw in the Eastern similarities *while* explaining the physics. But, overall, he is understandable and stimulating.

My major complaint, however, is with the hastiness in drawing the connection between physics and Eastern Mysticism. In a nutshell, while Talbot is certainly a stimulating writer anxious to fire the imagination, and while he seems to have a grasp of the physics and of Buddhist thought adequate for his purposes, he is not a careful philosopher. His evidence often does not justify his conclusion. I have already remarked that he oversteps the evidence in singling out one interpretation of Heisenberg's Principle; one that misguidedly moves from epistemological uncertainty to metaphysical indeterminism. Only the poet and mystic is permitted that license. Talbot might better have followed the example of Kant who did not deny an objective noumenal reality, only our ability ever to know it. He might better have concluded only that for science *certain* "cosmic eggs" *are* wrong, but more than one may be useful. Philosophically, such a conclusion is far more acceptable than the metaphysical overstatements Talbot makes. The fact that alternative cosmologies are each useful does not entail subjective idealism as Talbot suggests. It may mean only permanent epistemological uncertainty about an Absolute Reality beyond our ability to understand, or it may even mean only a temporary uncertainty about such a Reality.

Christians can profit much from Talbot's accounts of the new physics, but at least evangelical Christians must draw the line at the radical subjectivism and the ethical relativism.

Reviewed by V. James Mannoia, Jr., Department of Philosophy, Westmont College, Santa Barbara, California 93108.

THE CALL TO CONVERSION by Jim Wallis. San Francisco: Harper & Row, 1981. xviii, 190 pp.

A CHRISTIAN MANIFESTO by Francis A. Schaeffer. Westchester, Illinois: Crossway Books, 1981. 157 pp.

Just as there is more to life than being born, there is more to the Christian life than being "born again." Ethics is doomed to remain infantile if the theological and ecclesiastical focus remains fixed on spiritual obstetrics. Two Christians who emerged as leaders (even gurus for some) in the Evangelical call to mature discipleship during the Seventies are Francis A.

Books Received and Available for Review

(Please contact the Book Review Editor if you would like to review one of these books.)

M. Albrecht, *Reincarnation: A Christian Appraisal*, InterVarsity Press

E. J. Ambrose, *The Nature and Origin of the Biological World*, Ellishorwood Pub.

N. Eldredge, *The Monkey Business: A Scientist Looks at Creationism*, Washington Square Press

J. H. Ellens, *God's Grace and Human Health*, Abingdon

M. Goldberg, *Theology and Narrative*, Abingdon

M. J. Gorman, *Abortion and the Early Church*, InterVarsity Press

J. H. Haines, *Committed Locally, Living Globally*, Abingdon

M. Harper, *The Love Affair*, Eerdmans

R. Keeley, ed., *Eerdman's Handbook to Christian Belief*, Eerdmans

R. M. McCarthy, J. W. Skillen and W. A. Harper, *Disestablishment a Second Time*, Christian University Press

J. Needleman, *Lost Christianity*, Bantam

W. Neil and S. Travis, *More Difficult Sayings of Jesus*, Eerdmans

M. E. Osterhaven, *The Faith of the Church*, Eerdmans

T. Plantinga, *Learning to Live with Evil*, Eerdmans

L. D. Scanzoni, *Sex is a Parent Affair*, Bantam

L. E. Schaller, *The Small Church is Different*, Abingdon

R. J. Sider and R. K. Taylor, *Nuclear Holocaust and Christian Hope*, InterVarsity Press

J. W. Skillen, *International Politics and the Demand for Global Justice*, Welch/Dordt

M. Stewart van Leeuwen, *The Sorcerer's Apprentice: A Christian Looks at the Changing Face of Psychology*, InterVarsity Press

J. S. Swihart and S. L. Brigham, *Helping Children of Divorce*, InterVarsity Press

D. Tutu, *Crying in the Wilderness: The Struggle for Justice in South Africa*, Eerdmans

D. L. Wolfe, *The Justification of Belief*, InterVarsity Press

R. Zwier, *Born-Again Politics: The New Christian Right in America*, InterVarsity Press

Schaeffer and Jim Wallis. Their most recent books (reviewed here) offer little that they have not often said or implied before. Nevertheless, these are helpful summaries of their agendas and make for especially interesting reading when compared with each other.

Francis A. Schaeffer, for the few who might not have heard, is the leader of a Christian ministry in Switzerland, called L'Abri. His best known works are *The God Who Is There* (1968), *How Should We Then Live? The Rise and Decline of Western Thought and Culture* (1976), and *Whatever Happened to the Human Race?* (1979); the latter two were issued with companion film series. Jim Wallis, a generation younger, is best known as the leader of the Sojourners community in Washington, D.C., and editor of its magazine since its inception in 1972. He is author of one earlier book, *Agenda for Biblical People* (1976).

Schaeffer's *Manifesto* assails theologically conservative Christians for their "Platonic spirituality," an overemphasis on personal piety to the exclusion of the intellectual (and social) implications of the Lordship of Jesus Christ. Thus, not only has the world in general replaced the old "Christian worldview" with a materialistic, secular humanist worldview, but Christians themselves have thought in "bits and pieces" and not cultivated awareness and appreciation of this Christian base. They are unprepared to act in the present time of great need and opportunity.

Growing directly out of this philosophical and religious shift is relativism in ethics, a loss of commitment to the sanctity of human life, arbitrary sociological law and government, and blatant discrimination against Christian values and activities. Schaeffer is particularly hard on Christian lawyers for not seeing and opposing this trend. And more than anything else, the issue of abortion (the largescale slaughter of unborn human life) crops up as Schaeffer's major concern.

Schaeffer calls for attention to the intellectual and social aspects of the faith. He gives qualified approval to the Moral Majority attempt to counter the secular humanist establishment and argues that, with the conservative political triumph in 1980, Christians may and must become active in working for a reassertion of biblical truth in law, politics, education, the media, etc. If ordinary legal and political channels fail, or are closed off in the future, he explains and attempts to justify (in advance) civil disobedience and even revolution as possible avenues for Christian protest and change.

While Schaeffer suggests that Christians are the "people of the Idea" (my description), Jim Wallis reminds us that the early Church was known as the "people of the Way." His *Call* is rooted in the biblical emphasis on coversion as essentially a turning from one way of life to another in the footsteps of Jesus and in companionship with his disciples. Wallis points to a serious betrayal by those who take the name of Jesus and espouse a "high Christology" on dogmatic issues, but who ignore the way of Jesus and, in effect, have a "low Christology" when it comes to ethics.

While Wallis and *Sojourners* have spoken out quite clearly against abortion (Schaeffer's central political issue), the *Call to Conversion* focuses on the two problems of poverty and nuclear weapons. Insensitivity and inactivity with respect to these global challenges is permitted and encouraged by the weak, sub-biblical approach to conversion in the Church. Wallis's chapters on these two demons are, in my view, among the most sane, realistic, sensitive, and Christian reflections you will find anywhere.

Wallis calls for a better, more biblical understanding of conversion and discipleship. He details a vision for Christian community as the critical need in today's individualistic churches. A renewed worship (including greater appreciation of the Lord's Supper) must be the very heart and soul of the Christian koinonia, in Wallis's view. It is in this community that identity (as the people of Jesus Christ) is formed and nurtured. Here, the Spirit can provide discernment and support for corporate and individual action in the world. With Schaeffer, Wallis allows for civil disobedience; against Schaeffer, he does not believe that violence has a place in the way of our Lord.

Here we have, two contemporary witnesses for the case that contemporary Evangelicals need to grow beyond the point at which they meet Jesus and first confess him as Savior and Lord. Changes are needed in the way we think about Christianity and in the way we live. But here is where the discussion begins. Is the basic problem the loss of a "Christian base" and a Christian "worldview" or philosophy of life and final reality? Or is it the lukewarmness and conformity of the Church to the world? Do we stand in greater need of Christian philosophers or biblical ethicists? Is the critical issue of the Eighties abortion? Or is it economic injustice and nuclear terror? Is the top priority to engage in Moral Majority-type activism, or is it to renew the Christian community with worship at its core?

These options are not necessarily antitheses, of course, and perhaps the best answer is that all of the above are crucial. I am fairly certain that both Schaeffer and Wallis would affirm all or most of the above, at least in the simple form I have listed them. Nevertheless, the question of priorities cannot so easily be evaded. While I am grateful for much of Schaeffer's work, I would have to say that I think Wallis is more on target. This is partly because of his reading of the "signs of the times," which I find more convincing than Schaeffer's. More importantly, Wallis's book rings with the clarity and power of Holy Scripture in a way that Schaeffer's does not. Schaeffer is a Christian philosopher and evangelist of a certain type; Wallis is a preacher and pastor of the Jesus type. It is hard for Schaeffer, or anyone else, to compete with the power of a simple restatement of the way of our Lord.

Reviewed by David W. Gill, Assistant Professor of Christian Ethics, New College Berkeley, Berkeley, California

CREATION/EVOLUTION, Issue III, Winter 1981; P.O. Box 5, Amherst Branch, Buffalo, NY 14226; annual subscription (4 issues) $8.00.

In "the Bombardier Beetle Myth Exploded," Chris Weber shows how Duane Gish has distorted the facts about this insect

in making unfounded claims in his book and debates. Weber then explains how the bombardier beetle's defense mechanism could have evolved.

Frederick Edwords delineates "Why Creationism Should Not Be Taught As Science" in "Part 2. The Educational Issues." He acknowledges the importance of religion and even its place in the public schools, but to allow religion in the form of Special Creation in the science classroom would be a category mistake.

Countering the demand for equal time on scientific grounds depends upon how one views education.

> If the purpose of the public schools is to be a forum for every possible scientific and non-scientific theory, if the job of teachers is to merely expose students to the various trends in our society and various fringe theories, then creationism definitely has a place in the science curriculum.

But then, so should astrology be granted equal time with astronomy, pyramid power with modern physics, the toxemia theory and Christian Science "negative thinking" theory of disease with the germ theory, the flat earth theory with the space program, and divining rod technology should be taken seriously for the benefit of future oil geologists and hydraulic engineers.

> On the other hand, if education, in large part, amounts to passing on the discovered knowledge of one generation to the next, and if there is such a thing we can label "knowledge," and if we accept there are some people who have more of this knowledge in certain areas than other people, . . . and if parents accept the "back to basics" model of education, . . . then there is no ground for . . . "equal time" for creationism in the science curriculum.

"Equal time" is American in political campaigns, but not in a learning experience in secondary and elementary schools. Edwords' style is crisp and lively, using humor and wit with impeccable logic.

Edwords lists five alternate theories of origins and their relationship to special creation and evolution, and then defines alternate views from Genesis, such as the Day-Age Theory, the Gap Theory, and Progressive Creation. He evaluates each on the basis of the scientific evidence, and defends theistic evolution from the attacks of special creationists. Alternate religious views of origins which might also demand equal time in science classrooms are described, including that of Scientologists, Buddhists, Mormons, and Hare Krishnas, who support their view in much the same way as Special Creationists, using negative evidence against evolution.

Edwords then deals with creationists' demands for a two model curriculum in history, by similarly describing other alternate, but unaccepted, views of history, and other unaccepted views of other classroom subjects that would have to be considered under any "equal time" arrangement. Most creationist school materials imply that (1) scientific opinion is equally divided on creation and evolution, (2) the case is equally good for both models, (3) there are only two models possible, (4) the evidence supports creationism, and (5) evolutionists believe absurdities.

> For one to espouse a two model teaching in science, one must ignore or be unaware of the educational havoc it will cause, the social problems, the legal complications, the effect on the quality of science, the effect on religious liberty, and the effect on academic freedom.

Robert Schadewald, a free-lance science writer, takes the 1980 model creation/evolution bill to be introduced in state legislatures, "preserved most of the creationist wording, but altered the bill to require teaching of flat-earth theory whenever conventional astronomy is taught," with the argument that his bill should be introduced in every state legislature in which the creationist bill is introduced. He found numerous and precise parallels between flat-earthism and creationism. "Literal interpretation of certain parts of the Bible is a motivating factor for modern flat-earthers, and they have an elaborate system of 'scriptural science' just as do the creationists." Both groups have used the same debate tactics.

Craig Howell reports on "How Not to Conduct a Panel on Evolution and Creation" from his negative experience at the Annual National Conference on Church and State. He thought it was a great waste that Americans United for Separation of Church and State should sponsor a panel so dominated by a position antithetical to their own, especially when the audience had come from all over the country to learn how to respond to the pro-creationist pressure on school boards and textbook writers.

This third issue of this *Journal* lists an update on creation bills and resolutions, based on the work of the creationist Citizens for Fairness in Education (of S.C.),

> *Final Postscript:* The journal *Creation/Evolution* has been published in nine issues through summer 1982. I highly recommend *Creation/Evolution* for all Christians interested in this issue. The articles provide insightful, documented, well-reasoned responses in answer to specific points raised by special creationists.

> A review of "Old-Time Religion and the New Physics" in Issue IX by Robert M. Price, who has a Ph.D. in theological and religious studies from Drew University and teaches ethics and philosophy at Bergen Community College, is worth noting since he goes out of his way to give ASA a favorable plug.

> Price starts out by stating that "current creation-evolution conflict has served as an introduction to the polemical tactics of the extreme right wing of born-again Christianity." This article focuses on "another current attempt by fundamentalists to bend scientific research to their own purposes. . . : creationism's twin is the endeavor to vindicate fundamentalist supernaturalism by appealing to the new physics."

> Price describes three polemical tactics:

> (1) Acceptance of modern physics because it appears to substantiate fundamentalists' faith. "The criterion for a given hypothesis's acceptability is not its inherent cogency but rather its positive or negative value for the evangelistic arsenal. The biblicist is already convinced of the truth of his inherited faith, so the truest scientific theory must be the one which comports best with it. And physics seems to fit, whereas evolution does not." (H. Richard Niebuhr)

> (2) Hermeneutical ventriloquism: "The sliding scale of inerrancy" is "the seemingly inconsistent attitude of fundamentalist apologists toward science." "Biblicists have maintained the literal 'scientific' truth of biblical statements on cosmology, chronology, and so forth, until the massive preponderance of evidence (and, one suspects, public opinion) made it impossible no longer to dismiss the results of scientific research. Then, with a sudden about-face, apologists claim that the Bible has not been shown to be in error, but that science has merely corrected our exegesis of what the literal sense of the Bible was trying to tell us all along!" "Apologists begin affirming that the Bible, not upstart science, tells us about the world. . . They finish up tacitly by admitting that science *not* the literal sense of the Bible tells us about the world. Exegesis must await scientific results, which it will never acknowledge."

(3) The irony of daring "to read scientific results into the text and then use this alleged 'anticipation of modern science' as a proof for the divine inspiration of the Bible!" Price describes such examples of efforts to co-opt modern science: Harry Rimmer's *The Harmony of Science and Scripture*, Tim LaHaye's *The Act of Marriage*, "prophetic predictions" of Hal Lindsey and other dispensationalist seers, von Daniken's *Chariots of the Gods*.

"Those fighting under the banner of 'scientific creationism' do not yet realize that the battle for the 'six days' and the fixity of species has been lost." "Those who can see which way the present battle is going have suddenly 'realized' that Genesis *really* meant to teach 'punctuated' or 'progressive' creationism."

Then Price gives his ASA plug: (italics added) "*It is important to indicate that the wild implausibilities we have considered here are* not *entailed by the espousal of 'theistic evolution' by evangelical Christians, such as members of the American Scientific Affiliation. They believe in biblical authority in theology, but are at liberty to recognize in the biblical text the presence of various genres of ancient literature. They are not compelled by a wooden biblicism to read Genesis 1 as a blow-by-blow description of the origin of the earth. So far as they are concerned, the 'how' of God's creation is a question to be settled by scientific research, not by exegesis. The evidence in favor of evolution leads them to conclude that evolution was the 'secondary cause' employed by God.*"

"Evolution's process of chance mutations and environmental selection is inherently nonteleological, whereas 'theistic' evolution implies just such teleology." "Evangelical evolutionists are not guilty, either of any inherent contradiction in their position or of the intellectual dishonesty of the fundamentalist 'scientific creationists.' "

Contemporary subatomic physics is the latest attempt by fundamentalist apologists to co-opt modern science:

(1) Identification of the strong nuclear force binding protons together in the nucleus by reference to Colossians 1:17. Price calls this the hoax that modern science is miraculously intimated in the Bible. He claims its proponents have a "woefully poor grasp of science," and "a surprisingly lame theology." Price quotes the warning against this "god-of-the-gaps" position from Dietrich Bonhoeffer. "Anyone familiar with theological discussion is amazed to find such a view still alive and well in 'scientific creationist' literature."

(2) Vindication of the doctrine of the Trinity, using the analogy between God as "three persons, yet one essence" and "the three basic particles of matter: an electron, a neutron, and a proton."

(3) Vindication of supernaturalism by appealing to the indeterminacy principle of Heisenberg: "the most remarkable irony of all." No one need feel ashamed to recognize the occurrence of paranormal and extraordinary events, as if they implied some superstitious belief in magic, for now "miracles" can be rendered plausible since anything is as possible as anything else! "If one were to approach the issue of Jesus' resurrection on the grounds provided by the appeal to the new physics, one would end up arguing that it is quite probable (at least plausible) that Jesus came back to life, but that this must have been a freak accident, proving absolutely nothing about Jesus' divine mission or his relation to God. Their strategy of getting the unbeliever to accept the narrative at face value at any cost renders superfluous the whole point (God's miraculous intervention) of the gospel writers." "These apologists do not see that the argument from physics against casuality subverts such arguments completely." Fundamentalists universally reject the "swoon theory," yet the argument from physics against causality would logically tend to result in the same kind of reasoning.

Their real concern "is with the inerrant accuracy of the biblical text, not with the beliefs and values taught therein." "Fundamentalists say they love the truth, yet they seem to be guilt of the worst kind of intellectual dishonesty." "Francis Schaeffer means to assure his readers *in advance* that all the evidence will be found to agree with the evangelical biblicist view." "Either it will be denied in the name of the biblical text (c.f. the creationist attack on evolution) or it will be ventriloquistically co-opted (as in the case of the new physics)." "Such a doctrinaire stance is out of the question for scientists and alien to the sentiments of the Apostle Paul, who was humble and honest enough to admit that "now we see through a glass darkly . . . now I know in part.' " (1 Cor. 13:12)

Reviewed by Jerry D. Albert, Research Biochemist, Mercy Hospital Medical Research Facility, San Diego, California 92103.

WHO NEEDS THE FAMILY by O. R. Johnston, Intervarsity Press (1979). $5.95, 152 pp.

A *strong* family structure is a source of individual identity and vitality that urgently needs nurture today. *Who Needs the Family* by O. R. Johnston is an excellent book for counselors, pastors, parents, and others who need to assess the trend of society with regard to the family. It is based on sound scriptural principles. It is not a how-to book; instead it builds a strong foundation for the defense of the mom-dad-children family which is under heavy attack in western society.

The book is divided into five chapters—Family, Marriage, Motherhood, Fatherhood, and Family Decay. These were given as a series of lectures in England in 1978. Each chapter begins with a general view and concludes with a biblical viewpoint.

It is interesting that every known society recognizes the family. Sociology and anthropology textbooks emphasize this fact. Johnston cites some impressive work done by researchers, for example, psychiatric thinking that investigates the patient's environment and looks at the family of the patient. The Israeli kibbutz comes under scrutiny. From the original intent of abolishing the family and living communally, the movement is now showing family characteristics more and more. From the beginning, the Bible shows an orderly pattern of family and close relationships. The first chapter closes with a challenge: evangelistic and pastoral work should take into account families rather than "atomized individuals."

At the base of the family stands the marriage of man and woman. Marriage is more than sexual access, it involves interdependence and cooperation. Various patterns exist in different societies. One exhaustive study showed "the greatest energy has been displayed by those societies which have reduced their sexual opportunity to a minimum by the adoption of absolute monogamy." In addition, marital role definition based on the physical differences between male and female is necessary for a strong marriage. From the Bible it is clear that marriage is a "one flesh" experience. Marriage is an excellent and holy thing and should not be forbidden.

In the West economic pressures cause stress in the thinking of women who desire to be housewives and mothers, rather than potential workers. The model role of the mother is necessary for the girl. Investigations have revealed harmful effects upon the growth of the child's personality when there is a break in the continuous love relationship with the mother. Scripture takes motherhood seriously. Jesus showed concern for his mother when he entrusted Mary to the family of John in John 19:27.

The father is the mediator between family and society. Johnston writes that the model role of the father is necessary for the boy; the absentee father weakens the positive fatherhood image. Fatherhood is fundamental for the family because it is a reflection of the *Divine* nature.

The last chapter begins with the startling statement that "there is no evidence of instability . . . in societies where marriages are arranged." The family is needed by the individual and society. Some areas of decay that are noted are: (1) wife battering, (2) child abuse, (3) divorce, (4) abortion, (5) one parent families.

The book ends with a four-fold reconstruction plan. We must (1) have a renewed grip on Scripture at every level in our churches, (2) become more sensitive to the attacks on the family, (3) be repentant and have a new openness to correction in our own families and churches, and (4) have a renewed vision of the spiritual battle that is taking place.

This book is one of the better books on the family that I have read.

Reviewed by Leo Setian, Associate Professor of Electrical Engineering, John Brown University, Siloam Springs, Arkansas.

MAN AND WOMAN IN CHRIST by Stephen B. Clark, Servant Books, Ann Arbor, Michigan (1980). 753 pp. $15.95.

WOMEN AT THE CROSSROADS by Kari Torjesen Malcolm, InterVarsity Press, Downers Grove, Illinois (1982). 215 pp. Paperback. $5.95.

Reading these two books at the same time provides quite an experience. In his massive epic with 668 pages of text, 5 page bibliography, 66 pages of notes, and two indices, Stephen Clark, Roman Catholic charismatic and coordinator of the Word of God, an Interdenominational Christian Community in Ann Arbor, Michigan, goes all out to establish the validity of a hierarchial authority structure. In her pocket-sized approach to the same set of questions, Kari Torjesen Malcolm, daughter of Christian missionaries in China and a missionary to the Philippines for fifteen years herself, provides almost diametrically opposite answers to every major question raised. Here are two devoted Christians, each totally dedicated to the authority of the Bible, and yet with perceptions of what it all means as far apart as one is likely to find. Is it any wonder that the issues are so difficult to resolve? Is it only coincidence that the author here who sees biblical evidence for an authority structure with man at the head is himself a man, and that the author who sees women called to freedom in their first love for Christ is herself a woman?

As might be deduced from its sheer size, the book by Clark is a careful and detailed analysis of the roles of men and women as perceived in the Bible and in Christian tradition. The style has a dissertation-like quality to it and is not easy reading, replete with enumerated theses, summaries of arguments, repeated arguments and frequent bottom-of-the-page footnotes in spite of the 66 pages of notes at the end. In spite of this, the careful structuring of the book enables its central message to be easily discerned. Clark finds the key texts to be I Corinthians 11:2–16, I Corinthians 14:33–38, I Timothy 2:8–15, Ephesians 5:22–33, Colossians 3:18,19, and I Peter 3:1–7. To these he adds two minor texts: I Timothy 5:1,2, and Titus 2:1–6. In the course of the book as a whole, however, he also involves about 400 biblical passages. Starting with Genesis 1–3, he develops his central theme: there is a created order in which woman is complementary to but subordinate to man, in the family and in the Christian community. This created order is expressed through specific social roles for men and women. Approximately one-third of the book is devoted to setting forth scriptural teaching, one-third to discussion of this teaching against the background of historical scholarship and tradition, and a final one-third to the application of these principles today in view of modern technological practice and scientific understanding. Although the author's principal concern is with the life of the Christian community, there are, to the best of my knowledge, no references to the Holy Spirit in the book.

There is, to be sure, much in this book worthy of study that will be provocative for anyone attempting to describe a Christian lifestyle in community and in the world. Its very completeness makes it a valuable addition to any library concerned with men's and women's roles, since, at the very least, it presents a detailed and careful exposition of one perspective with arguments against many competing perspectives. There is a thorough evaluation of biblical authority, and a discussion of standard ways used to "bypass" authentic biblical teaching by "Christian Liberationist Exegesis." Any Christian dealing with these issues will not wish to treat these serious issues without as much input as possible.

Presumably no one would object when Clark indicates that "brother-sister love is the basis for all social roles and social relationships among the Christian people," that "the home should be a center of care and service," or that "the Christian community should provide a supportive environment for family life," but when he goes on further, some deep waters are entered into that do not seem to follow necessarily from his previous evidence. For example, "there should be a system for raising people in the Lord with men having primary responsibility for men and women for women," or "there should be different areas of responsibility for men and for women," or "there should be cultural expressions of role differences for men and women." The essence of his position is summed up in the following guideline:

> There should be a system of personal subordination among the Christian people with the elders (heads) of the community chosen from among the men and the husband serving as the head of the family, with women in complementary positions of leadership and subordinate government. (p. 605)

The principal alternate Christian model for marriage that Clark opposes is "the companionship model" in which husbands and wives share without subordination of one to the other (but with joint submission), in which due notice is not taken of the role differences between male and female ordained in creation and ordered in the New Testament. Even further raised eyebrows are occasioned by Clark's preoccupation with preserving manliness and womanliness, to the extent of advocating less time together for married

couples lest the man become "feminized." "A feminized male is one who has learned to behavior or react in ways that are more appropriate to women . . . He will be much more gentle and handle situations in a 'soft' way." Is it perhaps significant that the Beatitudes are not among the 400 passages considered by Clark? I have been increasingly impressed how very much the qualities that Jesus endorses here are characteristic of "feminine" qualities in our society rather than "masculine" qualities. I do not believe that I misread Clark on this point, for he goes on to say,

> . . . A feminized man may have a character in which the traits of gentleness and quietness are stronger than the traits of aggressiveness and courage . . . in the scriptures, quietness and gentleness are particularly emphasized in forming women, and aggressiveness and courage are especially underlined for men. Men are . . . in general, more aggressive than gentle. (p. 638)

Quite a different reading of the Scriptures and of history is given to us by Kari Malcolm. Within marriage she embraces the companionship model, seeing the advantage of having "two lines to God" rather than just one for the guidance of the family. But her principal concern is to point out a middle path between feminism on the one hand, and traditionalism on the other, a path in which a woman recognizes that her first love in life is for Jesus Christ and that she shares fully in all of the New Testament injunctions to witness and to share according to the gifts that God has given her. Three years in concentration camp in China, followed by fifteen years as a missionary with her husband in the Philippines, left her with culture shock when she returned to the States and found women caught on the dilemma between seeking marriage and a home as the only thinkable career, or seeking employment based on the pay scale regardless of the spiritual content of the work. She sees following wherever the first love for Christ leads as the way that God provides for better mothers, better wives, and better workers, rather than seeking these as ends in themselves.

Malcolm does discuss the same biblical passages as Clark does, but only after she has spent considerable time examining the events described in the historical portions of Scripture related to the activities of women and to the lives and contributions of Christian women and martyrs in history. These two books illustrate a major facet of biblical interpretation on controversial subjects (as applicable to the inerrancy debate as it is to the role of men and women). One approach takes the specific *didache* (teaching) of the Scriptures as normative and attempts to fit in the *phenomena* (the events described or present in Scripture) to conform to the teaching. The second takes the phenomena as evidences of actual practice and conceptual input and interprets the meaning of the teaching to be consistent with the phenomena. In the present situation, Clark follows the first approach, and Malcolm the second. It is not uncommon in such cases to end up in quite different places. Clark says that it is clear that I Corinthians 14:33–40 teaches that women should be forbidden at least a certain kind of speech (that speech inappropriate to their position as women or wives) because the passage says that they should be subordinate. Malcolm, on the other hand, says,

> Did women proclaim the good news? Or were they silent? . . . Why does Paul give instructions on the proper dress for women who pray and prophesy in public and then turn around and tell them to be silent? Was the great apostle inconsistent? (p. 70,71)

Clark responds that it is not all speaking that is forbidden, but only that kind of speaking inconsistent with the subordinate position of women. When she faces the other passages in the Pauline letters, Malcolm offers reasonable interpretations of why they might not mean what they have traditionally to be taken to mean (i.e., what they clearly mean according to Clark), in some cases relying upon modern or speculative exegesis to reorient the meaning of a passage. There is no question but that Clark would identify this as "Christian Liberationist Exegesis" and consign it to the "bypassing Scripture" category. But this is because Malcolm is trying to understand the teaching so that it conforms with the phenomena, while Clark is trying to fit the phenomena into his interpretation of the teaching.

Malcolm has a somewhat peculiar attachment to the ascetic life of contemplation and prayer that led people out of the world into monastic and convent communities. She defends this by pointing out that "Life for these women in the convents meant being liberated (from early marriage and heavy family responsibilities) for service to the kingdom." To these women Malcolm attributes the order "that kept Christianity alive through the Middle Ages." She finds the shortcoming of the Reformation in that it drove these women out of their cloisters into the world, where they were once more swallowed up in the cycle of husband, home and children. The Reformers get short shrift as being men who "as a whole held that women existed for the comfort and well-being of men." It is not clear that during this period women had any greater opportunities for witness and Christian service in the convent than they would have had in the world, as long as one includes raising children and maintaining a Christian household as viable choices for a Christian woman seeking to express her first love for Christ in this medium. Malcolm sees the proper place restored to women by the Wesleyan revivals in England and the Great Awakening in America. Later these nineteenth century gains for women were jeopardized by "the change from charismatic leadership to professionalized leadership and organized church institutions." Today Malcolm sees great opportunities for Christian witness and service for women, whether single or married. She finds a marriage blessed and rooted in having Christ as the head of the home, and extols the merits of volunteer work for Christ as a worthy goal for the Christian woman.

Are women ordained by a creation order to specific social roles that, no matter how broad or encompassing, are ultimately constrained by a position of subordination to a man in the family and to men in the Christian community? Or are women like men full bearers of the image of God and called like men to exercise in every way and every place the gifts of the Spirit that they have received? These two books may help you arrive at your own answers to these questions, although I suspect that most people who have answers to them have arrived at them without the intellectual soul searching that these books call for.

Reviewed by Richard H. Bube, Department of Materials Science and Engineering, Stanford University, Stanford, California 94305.

THE EVOLUTION OF CULTURE IN ANIMALS by John Tyler Bonner. Princeton, New Jersey: Princeton University Press, 1980, $14.50, 225 pages.

Bonner's book, being written by a microbiologist about animal and human behavior, is about the evolution of behavior. Probably no one *needs* to read it, especially those who have read *Sociobiology* by E.O. Wilson or *The Selfish Gene* by Dawkins. Nonetheless, it is well written, well-documented, and does cover behavior pretty well, if from a somewhat eccentric point of view. The thesis is given fairly by the title. Chapters include: Cultural and Genetic Evolution; The Early Origins of Cultural Behavior (bacteria, no less!); The Evolution of Animal Societies; The Evolution of Learning and Teaching; The Evolution of Culture.

Unless one were to take the position that the various breeds of dogs were separately created, anyone very familiar with them must suppose that they have engaged in microevolution/secular change over the past, and that this evolution includes their behavior. Thus, the idea that behavior evolves is not revolutionary. Bonner by no means claims that all behavior is hereditary, or that natural selection for human anatomy and human behavior occur by the same mechanism.

No doubt there are specific items in the book that some might quarrel with, but, except for the overall naturalistic world-view, there is little here for the average Christian scientist to be concerned about. As I read it, nothing in this book seriously challenges the Bible's teachings.

Reviewed by Martin LaBar, Visiting Professor of Science, Bryan College, Dayton, Tennessee 37321

GENETIC ENGINEERING by J. Kerby Anderson, Grand Rapids: Zondervan, 1982, 132 pages, Paper Back.

Both the benefits and possible dangers of affecting reproduction and heredity are treated in this volume by J. Kerby Anderson who is Director of Research at Probe Ministries. Trained in zoology and ecology and with special studies in government, he has done research in genetic engineering and speaks at major universities on this topic. The book is written so one not familiar with the techniques of genetics can readily understand them. Effective diagrams explain basic procedures.

Genetic research can cure genetic diseases and promote agriculture but also redesign existing organisms including man. All must be examined "with a recognition by us as Christians that human life is sacred because we are created in the image of God". Anderson weighs each of his topics and relates them to this fundamental Christian position.

Artificial insemination by husband and by donor are evaluated from scientific, legal, ethical and theological considerations in a balanced and fair manner, as the author does with the other topics: artificial sex selection, in vitro fertilization, genetic manipulation, which includes recombinant DNA research and human cloning. He concludes with a discussion of Christian responsibility.

Artificial insemination by husband is sanctioned, but the same by donor only as a last resort, accompanied by counseling on the marriage relationship, and not allowed for extramarital pregnancies.

"Although artificial sex selection may be beneficial in limiting populations in underdeveloped countries, there seems to be little warrant for its use."

In vitro fertilization, producing a "test tube baby," has many problems. The author discusses the history of governmental involvement, relates the successes of the Brown and Carr babies, and quotes significant comments from knowledgeable sources and concludes "that although IVF provides a means by which to help infertile couples, it is fraught with many scientific, social, ethical and theological problems."

The section on recombinant DNA research is fascinating—imagine a cross between a potato and a tomato! You will wish to have the book to read this thoroughly documented research on various organisms.

Finally, human cloning is considered and you will also want to imagine with the author its various possibilities, although distant. It may provide biological immortality (the printer left out the first "t"!), prevent genetic disease, add to twin studies, improve psychic communication, and be used for improved organ transplantation.

In the chapter on Christian responsibility is this concern, "We cannot expect people who do not accept the notion of human sinfulness and lack Christian commitment to protect society from disaster. Christians must participate in the policy making process."

Reviewed by Russell L. Mixter, Professor Emeritus of Zoology, Wheaton College, Wheaton, Illinois.

ANATOMY OF AN ILLNESS AS PERCEIVED BY THE PATIENT: REFLECTIONS ON HEALING AND REGENERATION by Norman Cousins. New York: Bantam Books, 1981, $4.95, 173 pages.

No doubt some readers will recognize the title of this work, and wonder about the date given above. I am reviewing the Bantam paperback issue of a book originally published by Norton in 1979. The book, which was considered important enough to be serialized in four periodicals, and by United

Features Syndicate, and to be a Book-of-the-Month Club selection, has basically one message: patients should play an active role in their own healing.

Cousins, who was editor of *Saturday Review* for a number of years, makes a number of cogent, if mostly unoriginal, observations connected with his hospitalization for ankylosing spondylitis. These include: hospital routines are not designed for the good of the patients; an excellent chapter on placebos; the value of laughter in healing; the importance of stress in getting sick; the role of TV ads and the Food and Drug Administration in the proliferation of painkillers; a sane chapter on holistic medicine; and a recognition that the medical profession is not omniscient.

For the Christian, there must be agreement that healing should involve more *agape* love in such matters as making hospital food more palatable and not bleeding a patient four times in one day for four different tests. There must also be agreement that belief in medicine, doctors, or especially in God is an important factor in healing, and that "a merry heart doeth good like a medicine" (Prov. 17:22). We can also affirm that doing away with pain is not the most important goal in life, and can certainly agree that the medical profession is not omniscient.

That many Americans are not fully satisfied with the way things are, in terms of their health, or their experiences in doctors' offices and hospitals, is obvious, one of the signs being the popularity of Cousin's book (which was well received by the profession). Even if one can doubt whether most patients have the resources to bring to bear on their own problems that Cousins did, by our life-styles, our attitude, and our faith, we can play a role in our own healing.

Reviewed by Martin LaBar, Visiting Professor of Science, Bryan College, Dayton, Tennessee 37321

BENT WORLD: A CHRISTIAN RESPONSE TO ENVIRONMENTAL CRISIS by Ron Elsdon, Intervarsity Press, Downers Grove, Ill., 1981. 170 pp. $4.95

Dr. Elsdon begins by discussing several possible involvements of Christians in our environmental problems that many, including some scientists, now realize are not likely to be solved by science and technology alone. Lynn White and others have blamed environmental abuse on the effects of the Judeo-Christian teaching of creation (Gen. 1:28), and even stated that the remedy must also be essentially religious, but of another religion. However, this does not explain environmental abuse by those who do not follow Judeo-Christian teachings.

Rather than back off as suggested, Elsdon believes that Christians should gain a balanced biblical perspective, realize their social responsibility, and make the gospel relevant in the eyes of others as we help correct environmental problems that stem from the fall of man.

Before proposing several Christian responses, Elsdon presents brief accounts of the serious environmental problems concerning the world's metals, energy supplies, cities, and food (ch 2–5). Although many of these problems are familiar to us, Elsdon's background as a Cambridge geologist adds many examples of British environmental problems that enrich our understanding.

Chapters 6, 7, and 8 (66 pages) give some biblical perspective in terms of creation, the fall, salvation, redemption, materialism, and the environment. In the beginning God told man to take care of creation. After the fall, man was no longer in close fellowship with God and correctly understood neither God, himself, nor his responsibilities. In his pervasive insecurity, he turned only to the created world, not the Creator, and selfishly pursued material possessions as ends in themselves in spite of commands not to covet, love money, or give possessions top priority. This change in understanding and attitude of giving short-term personal gain priority over long-term concern for the environment as God's creation only increased man's insecurity. His expanded material possessions did not provide lasting satisfaction and the deteriorating environment tells him that his irresponsible quest for more has reduced the ability of the environment's ability to give him even more material things.

When man's relationship to God is restored through salvation in Jesus Christ, does this primarily moral and spiritual event also change man's nature enough to affect the way he views and treats the physical world? The Bible says little specifically on the new relationship between man and nature. Christians, however, can be transformed by the renewing of their minds and change from former self-centeredness, with lack of concern for others and for the consequences of their own actions, including environmental. But the materialistic pattern of our present age so easily sustains our *old habits* and fears that we drift back into materialism with its disregard for proper environmental stewardship.

The New Testament exhorts us not to be anxious about our material needs (Matt. 6:25), to be content with what we have (1 Tim 6:6–8, Heb. 13:5–6), and to place our security in Christ. This renewal of mind and a more responsible lifestyle are part of our testimony (witness) as God's children carrying out His will on earth as it is in heaven. We are not to underestimate our individual and small-group efforts as we encourage the church to expand its responsibilities to the caring for God's creation as man was instructed before the fall. Even though this new moral dimension and persuasive lifestyle will only improve rather than perfect our world, we are not to despair, feel helpless, and sink into inactivity. Elsdon suggests several realistic ways individuals and groups of Christians can meet this challenge at several levels.

This book is certainly germane for our time. It needs to be read and its principles implemented by all who are interested in helping solve our environmental problems and by Christians wanting to increase the effectiveness of their witness.

Reviewed by L. Duane Thurman, Professor of Biology, Oral Robert's University, Tulsa, Oklahoma.

THE 1980'S: COUNTDOWN TO ARMAGEDDON by Hal Lindsey, New York City: Bantam Books, 1981, 178 pp., $6.95.

Here we have a book by the "No. 1 Apocalyptic Evangelist" of our times, a man who has written 6 books selling over 30 million copies, published in 30 languages. He thus evidently, has a huge following, one which could hardly be persuaded that he is wrong. Since he prophecies, or interprets prophecies, he is, at least, a minor prophet himself. He is a peerless purveyor of dire news and if his warnings cause mankind to think about religious matters, he has accomplished something worthwhile.

There are eleven chapters followed by a footnote section. The following figure strongly in the book; communism in Zimbabwe, the Russian invasion of Afghanistan, the sale of technology to China, the Israel-Egypt attempt to settle their differences, the European Common Market with its 10 members, the Salt II treaty, the military coup in Liberia, the lack of battle-readiness of the American armed forces, and, of course, the Bible prophecies on these and other subjects. Taking everything together, Lindsey concludes that "the decade of the 1980's could very well be the last decade of history as we know it." I do hope that I can have this review published before the final curtain falls. Just think, it is now 1982 and we have only 8 more years to go. Note, however, that in the quotation above he says *"could very well be"* and *"history as we know it."* These escape clauses should be borne in mind because they allow us to believe that the world will still be here by the year 1990.

The study of history is full of doomsday prophets and Lindsey's predictions should be taken with a grain of salt. "No man knoweth the day thereof" is a good admonition. There are events going on in the world, however, and largely not covered by the author, which do paint a rather gloomy picture for humanity.

There are three popular theories that come to mind dealing with the demise of the world. One is its destruction by atomic forces, another is its annihilation at the judgement day and the third is the explosion of the population bomb. According to many experts, the third theory is by far the most likely. The mere doubling of the world's population in the early part of the 20th century, despite our half-hearted efforts to control it, will have so many catastrophic consequences that the world can become only a "madhouse." I fault religious writers for almost totally ignoring the population problem. The second theory is a possibility but it may well be interepreted as a corollary of the third.

Some points that should be clarified; on page 12 "The prophets said that the Arabs . . ." and on page 13 "Ezekiel, Daniel and Zechariah all said"—no verses are given for these statements. On page 29, he seems to favor the predictions of dire events when all the planets become aligned (the Jupiter effect). To date, there has been no catastrophies which can be assigned to this effect. On page 39 we find, "In fact, I wouldn't be surprised if Israel launched an attack on Russia as well. . . ." I take it that this is the author's prophesy and is not found in the Bible. On page 90, he speaks of the destruction of Russia by Israel. This seems so ridiculous that I am sure Lindsey has gone wrong somewhere. On page 100 and following, the author devotes some space to the Common Market and I am not clear as to whether the Messiah will destroy this "Monster," since it has as one of its members the anti-Christ, before or after He has destroyed the atheistic Russian Bear.

All Hal Lindsey's books are interesting reading and should make one think about the sad condition of the world and hopefully to turn to religion for solace. I personally feel that much of his philosophy is based on too sensational an interpretation of biblical passages.

Reviewed by Irving W. Knobloch, Michigan State University, E. Lansing, Michigan 48824.

THE SEARCH FOR AMERICA'S FAITH by George Gallup, Jr., with David Poling, Abingdon, Nashville, Tennessee (September, 1980), $8.95.

This study of American religion in the decade of the 1970s by the director of the Princeton Religion Research Center and his associate continues the pollster's fascination with the study of religion. The book illustrates the value of keeping a pulse on religion as it shifts with dynamic change in society. But it also offers a reminder that the influence of polling, as proper as it might be in society, has no place in the study of religion.

The data are selected from an impressive array of Gallup polls and directed toward certain issues: the unchurched, youth, family, future of religion, and Catholicism. But the presuppositions underlying the data are often shaky. The claim that "the future has us in its grip" suggests neither a responsible view of social science nor of the power of the Holy Spirit. Especially in their religious faith, people do not act in predictable ways. What the data can give us are only current trends and not future determinants.

What are these trends? Some of the most notable offered by the authors are: (1) youth's persistent criticism of the church in spite of their increased concern for personal religious faith, (2) continued confidence in the family in spite of its shakiness, (3) an increase in the number of unchurched believers, (4) an improved climate for ecumenicity in spite of a reduction in church membership, and (5) a tendency toward orthodox convictions of believers but without orthodox practice. In sum, the portrait of today's American religion is filled with ambiguity and contradiction.

This is useful information, especially for the layman who wants to know where we've been. But it will not provide a reliable map for the future. The data also have value in the broad contexts in which they are presented. What is lacking are the clear and crisp relationships sought by the scientist.

This "pop" quality is, perhaps, the book's most notable strength or weakness, depending on your point of view. There is too much reliance on undocumented materials used as fillers. And when a poem by D. H. Lawrence is documented, it adds little to the integrity of the book. Definitions are of

little concern to the authors and no index is given. In short, it is a book designed for casual reading and not study.

Nevertheless, it is encouraging to note the continued interest in religion as a social phenomenon. There is a tension between the sacred and society which needs to be studied. Although this book does little to advance that study, it may whet a few appetites to feast on richer fare elsewhere.

Reviewed by Russell Heddendorf, Professor of Sociology, Covenant College, Lookout Mountain, Tennessee.

WORLD HUNGER, TEN MYTHS by Frances Moore Lappé and Joseph Collins. 52 pp., notes, selected sources, and Organization's publications. San Francisco: The Institute for Food and Development Policy, 1979. $2.25 paperback.

Rather than list the ten myths referred to in the title, it might be better to turn to pages 51 and 52 where the myths are countered with *true* statements.

1. Every country in the world has the resources necessary for its people to free themselves from hunger. *(Broadly interpreted, this could be true.)*
2. To balance a country's population and resources, it is urgent to address now the root cause of both hunger and high birth rates: the insecurity and poverty of the majority that results from the control over basic national resources by a few. *(If many controlled, I am not sure that the problems would go away—hunger is due to an insufficiency of food which is tied directly to overpopulation.)*
3. Hunger can be overcome only by the majority first transforming the social structures so that they directly participate in building a democratic economic system. *(Many claim that India is democratic and there are some who say that India cannot possibly survive much longer due to its antiquated philosophy and its resultant overpopulation.)*
4. Safeguarding the world's agricultural environment and people freeing themselves from hunger are complementary goals.
5. The hungry are our allies. Our food security is not threatened by hungry people but by a system that concentrates economic power into the hands of the elite. *(It is true that there have been many abuses by those who manage the "food chain" and these need to be stamped out, but those who are truly hungry are seldom well educated and cannot be counted on to have any input into food management.)*
6. Export agriculture is not the enemy. To insure food security, agriculture must become a way for people to produce their own food and secondarily a possible source of foreign exchange. *(This sounds good but there will always have to someone who directs the operation and hopefully he or she will not be one of the "elite". If the authors mean that everyone should go back to the farm, then we would truly become a rural society. I hardly believe the authors advocate this.)*
7. The most wasteful and inefficient food system is one controlled by a few in the interests of a few.
8. Hunger cannot be eliminated by denying people's freedom but by encouraging participation in decision making. However, it may be necessary to limit the choices of some. *(As we all know, a truly democratic system cannot work in a large, modern society and for this reason we are called the Republic of the United States, a political system whereby we elect representatives to make the laws for us. If we find the chosen ones to be unworthy, we recall them.)*
9. The response of Americans to hunger abroad is not more government foreign "aid." We must work to help remove the obstacles, especially those being built by U.S. economic and military interventions abroad and by the penetration of U.S. based corporations. *(The authors will get a lot of "flak" on this truth (?).)*
10. Our role is not to go in and "set things right."

A few notes on some statements in the forepart of the book should be made here. On page 8, it is stated that 80% of the children in rural areas of Mexico are undernourished partly because of feeding livestock. Livestock is one of their necessary exports to obtain money to buy food that they import in large quantities. Overpopulation is Mexico's "enemy." It is estimated that Mexico's 74 million will rise to 174 million in less than 40 years. Present-day problems there will seem small by comparison. On page 10, they claim that overpopulation is not the cause of hunger. Already the experts tell us that the world should hold no more than one billion persons.

On pages 13–15, much is made of the decrease in farms, the increase in technology and much unemployment. My guess would be that total farm acreage is increasing but the emphasis is on large, more efficiently-run operations. This is the way "it has to go" to prevent global starvation. One part of the solution is to greatly depress the birth rate so that no family has more than one child. This is one of the themes of Negative Population Growth, Inc based at 16 East 42nd St., N.Y.C. 10017. On page 35 they say that Cuba and China have achieved greater food, job and old-age security because they are in a state of freedom. In answer to this, I can only say that I must read different literature than they do.

The authors have raised some valid points and are, no doubt, very sincere in their beliefs. I do believe that dismantling the present system would not only be catastrophic but would be self-defeating in the long run. My belief is that the inequities and corruption of our present ways can be eliminated by building on what we now have. The book is well-worth reading even if you do not fully agree with the philosophy therein contained.

Reviewed by Irving W. Knobloch, Michigan State University, E. Lansing, Michigan 48824.

Letters

Reply to Recent Comments

A brief note on some of the comments published in recent issues of *Journal ASA*. As to my review of Galileo (Dec. 1981), actually I am surprised that, considering the fact that my conclusions were quite opposed to the popularized view, there were not more letters. I was, though, quite nonplussed at the statement that my sources were "questionable." DeSantillana, Drake, Barbour, and Ronan are among the most respected scholars on the history of science and Galileo today. DeSantillana has translated many of Galileo's works into English and, as professor of the history of science at MIT, his work is widely quoted, and, although not without criticism, respected. There were dozens of other references I could have used, but at the time, I felt they would serve no purpose.

When Galileo was brought to the fateful trial, he was an old man, in poor health and for this reason, the church's interference in his life work was minor. He had many interests and research directions, most of which he could pursue without problems. His defeat was more psychological, although it is true that the church attempted to suppress the work in heliocentricity. The question my paper dealt with, though, is *why* they attempted to suppress this position. And I think it is quite clear from the literature that the reasons included the attitudes of the Aristotelians, Galileo's secular enemies, and the opposition of academia in general to him and his ideas although, as I noted, there were many clerics also opposed to his position, many for reasons having nothing to do with pure religion.

As to the term "scientist," in this article I was referring to those that we would consider scientists in the loose sense of the word. Obviously, some "scientists" felt that the heliocentric position had some merit but Galileo had much opposition from the secular thinkers. I think, though, that the church's response only encouraged others to examine the heliocentric view.

Galileo was nearly 70 at the time of his "conviction" (this is 70 of 1600 years, not 1980 years). He could still do his work, but had to treat anything that touched the Ptolemaic system as theory, not fact. Undoubtedly, he was hindered from researching the heliocentric theory, nevertheless, he continued to make discoveries. In 1637 he made his last astronomical discovery, that of noting that the moon, as it circled the earth, swayed or vibrated. The heliocentric revolution had begun, but barely in many areas. When Harvard was founded in 1636, the faculty remained "firmly committed to the Ptolemaic theory."

I appreciate Owen Gingerich's comments. The problem with spelling is that it varies. My purpose was not to probe any thesis, but to review briefly the history of the Galileo affair, stressing that it is not a simple matter of "church dogmatics against men-of-science luminaries" as often supposed.

As to Blair's comment on my article on homosexuality (Sept. 1981), I obviously could not review extensively every article or even every aspect of this complex question. I reviewed only some of the more commonly quoted articles. Before the article was published, a number of biologists and sociologists interested in the question of homosexuality reviewed the article. Their main comment was, "Why examine the biological basis for homosexuality, when almost no one in the field, at least none of those oriented toward the psychological-sociological profession, gives any credence to any biological basis theory of homosexuality?" Thus I find somewhat surprising Blair's statement, "We find [in Bergman's article] an example of what lengths supposedly scholarly, Evangelical enterprises will go to to fight against the biological basis for homosexuality." There is no clear evidence of a biological cause for homosexuality, although I admit that all of the evidence is not in yet. Some good evidence, though, is.

As to Struckmeyer's comments on my article on aggression (June 1981), I was not referring primarily to techniques used by trained therapists in therapy sessions. I have worked with therapists who regularly use primal therapy, and I find that reactions are mixed. My point is that expression of certain kinds of aggression in our society, except in a very controlled calculated way, tends to be non-functional and often backfires. I could have been more specific as to defining terms, but felt this was not necessary. I do though, appreciate his feedback and personal experiences.

In addition, expression of aggression in many people, at least, seems to encourage further aggression, often leading to a vicious cycle. Obviously, to completely cover the topic requires writing a book, which many people have done. I had simply hoped to point out some of the problems of overly free expression of aggression, especially in overt physical ways.

Hopefully these comments are helpful.

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Defense of Moderate "Special Creation"

Jerry D. Albert, in the September 1982 issue of the *Journal ASA*, p. 178–179, condemns "special creationism" as a dangerous belief. His warnings seem to be based on the assumption that the only kind of special-creation doctrine is young-earth, extreme creationism. We readily agree that the latter is a great danger and disgrace to evangelical Christianity, but it is important that we encourage belief in the special creative acts of God as outlined in the first three chapters of Genesis.

To imply that the only safe (non-dangerous) alternative to atheistic evolution is theistic evolution is to tragically ignore the lives and work of many conservative Bible scholars and scientists who have accepted the evidence for long geological ages and also the Genesis account of creation as including at least several special acts of God. . . . Some Christian geologists of the past . . . are respected both for their contributions to science and their defense of special creation. A few of the present-day evangelical authors who are defending special creation as well as long geological ages are Arthur Custance, Robert C. Newman, Herman Eckelmann, and Davis Young. Both the writings and the successful ministries of all the persons listed above show that they have been able to hold to their belief in special creation without becoming victims of the inconsistencies characteristic of the extreme creationist movement which is now causing so much confusion.

The ASA will be doing the evangelical community a great disservice if we continue to speak and write as though theistic evolution were the only acceptable position between the two extremes of atheistic evolution and young-earth creationism. After all, our Affiliation was founded by persons nearly all of whom held to special, fiat creation in a setting of long geological ages; and this view

has not been discredited by any recent biblical, theological, or scientific research. By neglecting to recognize the dignity of the original doctrine of special creation we have encouraged those evangelicals who do not want to accept theistic evolution to join extreme creationist organizations instead of our own.

Every ASA member should read Chapters 3–5 of Davis Young's *Christianity and the Age of the Earth* (Zondervan, 1982) so as to gain an understanding of the reasonableness and dignity of the special-creationist views held by many conservative Christian leaders of the past two centuries. Distortion and imaginative development of special creation *is* harmful, but the concept of special creation itself is logical, biblical, and compatible with modern science.

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Contributions Requested to Archive on Creation/Evolution

The Department of Special Collections of the Iowa State University Library, with the cooperation of faculty members of the University, has begun an extensive program of soliciting contributions to be part of a recently established archive of both published and unpublished materials relating to all aspects of the continuing dialog between proponents of evolution and creation. This archive has as its focus the solicitation, preservation and indexing of materials which will aid scholars who wish to explore, research, analyze and interpret evolution science and creation science.

Persons and organizations have already contributed correspondence, journals, books and bibliographies to the evolution/creation archive. Stanley Yates, Head of the Department of Special Collections said, "Although interest in evolution/creation is very high and many who are involved in this express the need to retain much of their own files, the response has been very encouraging. Proponents of evolution and creation recognize the necessity of sending their materials to a place where they can be preserved and yet be available for interested persons."

Yates continued by encouraging anyone who has such materials to contact him even if for the present they wish to retain their files. "Once such materials are lost," Yates noted, "it is very difficult, sometimes impossible, to replace them."

All inquiries should be sent to:

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Thus to want to show that the Bible is also *science is not to understand either the nature of science or the dignity of the Bible. It is to demean the Bible rather than to exalt it. It is in effect to look upon science as superior and to subordinate the Bible to science.*

Charles Habib Malik in *A Christian Critique of the University*. InterVarsity Press (1982), p. 49.

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