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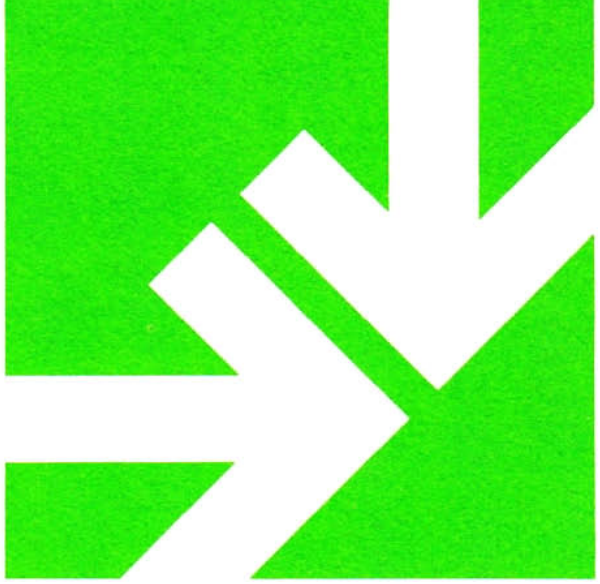

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"The fear of the Lord is the beginning of Wisdom." Psalm 111:10

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JOURNAL OF THE AMERICAN SCIENTIFIC AFFILIATION

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The Nature of the Transitions of Growth

C. MARKHAM BERRY

Therapist
Atlanta Counselling Center
Atlanta, Georgia

Biblical insights strongly suggest that the end point of human development should be conceptualized as a special capacity to relate to others in a paradoxical way—to be able to form a new union which respects the diversity of the individuals. This is likened to one body consisting of many members. The union is real, concrete and fundamental, but the diversity of the individuals, accomplished in the separation and individuation is not lost, but rather fulfilled.

The study of a human person as one who grows has always been one window on our understanding of ourselves which has let in a great deal of light. Psychologists particularly have long inquired into the development process, both to work with children and to better understand problems of the adult. In recent years this general interest has stimulated two specific lines of investigation. One of these, exploited largely by psychoanalysts, has been the depth exploration of early object relations in the mother-infant interaction. The other, by non-analysts for the most part, has involved prospective, longitudinal studies of the life course of the human from birth to death. The purpose of this paper is to attempt to bring some degree of synthesis to these lines of endeavor and in the process to extend our understanding of both. In order to do this some key biblical insights are elucidated that serve as the basis of this synthetic work.

Propositions

The propositions to be submitted in this paper are as follows:

In essential nature a human person is a being-in-process and must be considered, at least in one dimension, as developmental.

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Over the life span this development tends to proceed in steps, or progressive levels of maturity. Each of these develops the interpersonal life, extends one's understanding of the world, and more precisely defines one's sense of self or identity.

These steps can be understood as transitions that follow a characteristic form. This pattern is repeated again and again, though each level of maturity deals with different specific issues.

This standard transition proceeds through three phases. It begins on an initial platform of undifferentiation or fusion. Growth pressures then tend to break this up and there follows a separation and differentiation process in which the key issues of the particular developmental step involved are teased out. The third phase involves a re-approximation of these now discrete elements. This produces a new union, one which restores a relationship of the separated parts within the whole but maintains their integrity. This new condition, paradoxically a unity which consists of diversity, contains another undifferentiated issue and becomes the platform from which subsequent steps proceed in due time. As growth proceeds, each successive cycle undertaken further develops and refines the distinct elements previously separated out more maturely, but centers on the specific distinctives of that particular step.

In order to establish these propositions, current work on the early development of the infant on the one hand, and the life cycle on the other are reviewed to the extent that they are helpful to our immediate purposes. To this is then added a biblical view of human identity, and finally a pattern repeated in the transitions involved in human growth is defined and illustrated.

Pre-oedipal Development

In the last 30 years psychoanalytic thought and research has focused almost exclusivcly on the first 2-1/2 years of life, or the pre-oedipal developmental process. This thinking foundation was laid on insight contained in Freud's work (1895, 1941), and has been enriched from empathic observation of infants (A. Freud, 1937; Spitz, 1946), from Piaget's studies on cognitive development (Wolff, 1960), ethology (Harlow, 1974) and childhood pathology (Bowlby, 1969 and 1973).

This work has focused variously on the origins of the self, or identity (Jacobson, 1964), narcissism (Kohut, 1971), ego adaptation and defense (Hartmann, 1958). It was stimulated and encouraged by the kinds of pathology that the psychoanalyst was seeing in his practice. Mahler's germinal work centered originally on psychotic children (1955), Kohut writes for the most part about the narcissistic personality disorders, Kernberg's fruitful studies have clarified our understanding of the borderline personality, splitting and narcissism (1975, 1976, 1980) and the insightful work of the Tavistock School in England (Kline, 1955; Winnicott, 1958; Fairbairn, 1954; Balint, 1968) explored the depressive position and pathological withdrawal during these same early years. While all of these authors were working largely with pathological conditions, they felt that they were also shedding light on the normal development of this period of life.

Mahler has greatly helped us pull this work together by clarifying what happens during these first three years of life from the intra-psychic view of the child. She describes this "hatching of the human infant" as a process of growing away from mother. It originates in a symbiosis or fusion and proceeds through separation from the mother and individuation, or the delineation of a sense of self separate from mother. The work of her group in New York has carefully defined phases and subphases of this process (1975) and given us the key terminology which is now generally used.

We now understand that early growth involves, in parallel, both the relationship of the infant to his or her own "self" as well as to the "object world" (Jacobson 1964). The mother serves as model, practicing object and catalyst along the way. What is learned with her is extended inwardly in self-awareness and outwardly to a world view. The end point of these developing "object relations" is seen as a separate and discrete individual with a distinct sense of self, a person with integrity and constancy who is free to invest in love and labor at his or her own discretion. All significant psychopathology is understood as a failure to break away cleanly from this initial fusion with the mother and the world. Ongoing fusion with others, splitting or object inconstancy, identity diffusion, or failures to test internal and external reality validly are conditions arising out of faults and breakdowns in this single process.

Life Cycle Research

Another field of investigation which has flourished in the last twenty years or so has been the long-term, prospective, developmental study of adulthood. Many excellent researchers are involved in this venture, but some particularly stand out. Levinson and his colleagues at Yale (1978) have studied the middle years and describe in detail how structures are developed in a series of life transitions. They were particularly interested in work and the interface of the self and significant others. George Vaillant published in *Adaptations to Life* (1977) the results of a long-term study of Harvard students. This picked them up when they were college sophomores and continued in great detail to age 45. He largely concerned himself with measurable criteria of adaptation to the interpersonal, cultural and economic challenges of this particular group.

The fact that both of these scholarly studies have been widely read and have joined two other popular studies on the best seller list (Sheehee, 1978; Gould, 1978), indicates that this interest in adult life is more wide-spread than among social scientists alone. All of these books see life as a series of steps, each of which involves both a transition and a level of consolidation. Eric Ericson whose famous *Life Stages* were used by both Vaillant and Levinson has also recently added a wide-ranging study of *Adulthood* (1978). He intentionally follows the pattern of Phillipe Aires' famous *Centuries of Childhood* (1960), by showing how other disciplines, other ages, other cultures and religions have defined maturity.

There have been objections to this somewhat rigid, lockstep view of growth, though. Bernice Neugarten (1979), a widely-respected researcher in her own right, sees the process more fluidly. She still defines development as going through transitions but conceives of these as each being smaller in scale, but proceeding almost constantly.

Although there has been some feeling that these transitions might have some repetitive similarity in method if not their medium (van Gennep, 1960), this has not been defined in any generally accepted way.

Biblical Insights

Although the life cycle has been little dealt with in Scripture outside of the wisdom literature (Ecclesiastes 11 and 12), growth and development are very important recurring themes, dealing both with spiritual and psychological life. (See especially I Corinthians 3:1-4; 13:10-12; Galatians 4:1-6; Phillipians 3:12-16; Hebrews 5:12-15; 6:3.) New Testament thinking, in fact, suggests that God has created man in such a way that he is, in an important dimension, a developmental being, and this motif is played out in his physical, psychological and spiritual nature. This thought has been explored by the author in a different context elsewhere (Berry, 1980). It is mentioned here to call attention to another essential element underlying this growth process which involves an even more fundamental biblical motif. The Bible teaches in many different places that there is an undergirding unity between people that is both spiritual and psychological. It teaches at the same time that men are individuals distinct one from another and that there is a bond between them so concrete and fundamental that it is best described as oneness. It teaches that this oneness is at the same time an underlying fact, a process that is taking place and also a future promise.

One great horn of this paradox, man's individuality, is a truth which has over the last several centuries become a central axiom of western culture. This development in philosophy and theology has come about laboriously and Christian thinkers have had a great deal to do with it. Niebuhr devotes a major section of his discussion on the *Nature of Man* to this (1941, Vol. I, Chap. 2-5). He also points out the difficulty that philosophers have had maintaining real individualism when it becomes an absolute isolated from the values of community.

The Bible teaches that there is an undergirding unity between people that is both spiritual and psychological.

The other horn of the paradox of human nature is less well appreciated in our culture. The Bible implies that a fundamental source of the definition of our human identity involves others. The human diad, group, the community, nation and society in general do not simply label from the outside but define the person centrally under and within his own being. The man and wife are called one flesh. We are said to be one with each other and the church or community is described in metaphor as one body composed of many members, or one temple constructed of many stones.[a] Mystics, both ancient and modern, have more perception of this unity than other thinkers. Teilhard de Chardin states succintly, "Fuller being is closer union" (1959, p. 31). But the great burden of man's experience and thought and particularly his artistic expression bear witness to this same truth—we are one with each other and with the rest of mankind.

We must define man's identity then as a paradox: a unity that consists of diverse individuals, or a diversity that shares a central invisible but very real unity. Without undertaking a major Bible study, a few important passages help to illuminate this principle.

Paul tends to emphasize the diversity of one's individual gifts but he characteristically reminds us that we are individuals within a community, rarely mentioning one without the other. He says we are one body, of many distinct members (I Cor. 12:12), but always of one body (Rom. 12:5). This diversity means that each has his or her own gifts and callings, functions and feelings and usually thinks and knows in an individual way. As such, each member is a vital essential to the whole. This principle implies two fundamental corollaries. A man never functions, experiences or knows completely all by himself—he must partake of the gift of others. Also, the effectiveness of the function, the breath of the experience and the completeness

Markham Berry received his M.D. and psychiatric training from Emory University School of Medicine where he now serves on the part-time faculty. He also teaches in the Psychological Studies Institute at Georgia State University. He serves as a therapist at the Atlanta Counseling Center and as consultant to the Community Care Team at Grady Hospital in Atlanta. Most of his publications have been in the area of the integration of Medicine, Psychology and Biblical Theology.

of the knowledge of the community depends upon the enthusiastic contribution of all members. Individually we have the dual responsibility of being assertive of our own gifts and attentive and appreciative of those of others.

We, too, lean toward the individual side of this paradox. Perhaps because we experience ourselves through our senses as particulate, the blind, universal side of the paradox is hard for us to see. It may be because of this distortion of our perception that the Lord in His garden prayer places emphasis on our union. He asks "That they may be one. . .that they all may be one. . .that they may be one even as we are one. . .that they may become perfectly one" (John 17:11, 20-22).

Within this conceptual model a mature relationship is one that discovers and depends upon this otherwise invisible unity in a way that both honors and defines the individuality of each member and enjoys the distinctive gifts of each individual and yet sees them as parts of a whole. The good marriage explores, develops and displays this paradox most elegantly in the psychological realm, where the church, being not only one with one another but one with the Lord Himself does so spiritually. This thought seems to be central to the Letter to the Ephesian church and we find these principles summarized in the passage beginning at 2:11 and proceeding through 4:16. It clearly links the processes of growth with that of unifying a diversity into this particular complex. The fact that the section is followed by one of very simple, direct admonition to good behavior shows that this basic insight is a fundamental root of Pauline ethics as well (Reference Note 1).

Proposal

When we bring together these three lines of research and thought, we can define maturity as the potential a person has to be a unique individual, knowing himself as such, who is able to form growing, effective relationships with significant others. These will be more unions of distinct individuals than simple associations or fusions. The mature person will discover his identity in the confluence of both his individuality and his community, defined by the interface or interaction of these two paradoxical elements. Development from this perspective will be the process by which this maturity comes about. The development process, or growth phases, will no longer be considered as ending with the individual in isolation but as being capable of effectively joining a community in a reunion.

To recapitulate our earliest development, the first three years of life, the process is now pictured in the following manner. It begins with an original undifferentiated state, in this case a fusion between the mother and infant. This exists unchallenged normally up to about six months of age. At this time, the pressure within the infant to grow begins to be felt as a command to separate. This initiates a series of new behaviors designed to clarify the boundaries between the mother and infant. Also associated with this separation is an individuation process that explores the primary identity of the newly defined, separate person. Simultaneously, with most of this second phase will be seen a series of interactions like playing, fighting, talking, playacting, and mimicking, which all serve to explore not only the defining margins of the two persons but how they fit into a dynamic reunion in such a way that the gains of this individuation are not lost. If we watch a child during the stage of his development that runs from about six months to thirty months, we see that each time individuation has been achieved he applies it in an interaction which is aimed at an effective interlocking reunion. Even though the separation process begins with anxiety and tension, once gained, the normal infant guards it jealously and refuses to allow himself to be pulled back into a fusion.

The achievement of success in this initial development transition is measured by the ability of the child to play with others, to communicate and to make a start at loving and working. Things can go wrong of course at any of these three levels.

Looking at development this way adds two new issues to those currently dealt with in developmental psychology. Maturity is not here defined in terms of separation and individuation only, but also the ability to reunite without losing these gains. Also, we can expect that some psychological problems will be better understood as failures in the capacity to make this reunion rather than in adequate separation. For example, struggles to re-fuse rather than unite are sometimes seen in excessively dependent personalities. Again, the kind of persisting isolated separateness seen in the narcissistic personality might be more clearly understood as a failure of reunion rather than of separation.

Good parenting also would encourage the process fully through to the end. The adequate mother will not only suffer the difficulty of separation patiently and philosophically but seek, from her side of the diad, to experience, enjoy and understand this new individual. Giving and receiving, working and playing together, and the ability to seek out and listen to the developing person within the infant as separate and distinct from her are all parts of this process.

In describing the child's awareness of this primary phase of development, Margaret Mahler says, "It's not a sense of *who* I am, but *that* I am. . ." But development proceeds beyond age two and a half. The "who I am" exploration proceeds in later years as a series of further stages of growth occurring the rest of the life, each stage proceeded by similar kinds of transition. In order to apply this transition form to later life growth, we briefly sketch in the traditionally defined seasons of life and show how these three steps apply in each.

Seasons of Life

Oedipal. The initial phase previously discussed is followed by one which is usually called the oedipal stage. From three to six, the child takes on the complex task of relating effectively to one parent who is like him and another who is different. This peculiar triangulation serves to establish those identity issues which are related to gender. The boy still maintains the source of his own person gained earlier

but now must redefine this identity in a reunion with his father who models for him what maleness is. At the same time he also begins a peculiar kind of interlocking, appositional relationship of opposites with his mother. The successful completion of this stage is not just the definition of his maleness in isolation, but the capacity to experience this maleness as shared with his father and also as a part of a loving interaction with his female mother. With the girl, of course, the process is similar but the persons are interchanged. Normally, these are not issues of genital sexuality but a more fundamental maleness and femaleness. Maturity at this level allows free, peaceful and edifying relationships to form with both men and women.

Latency. The onset of normal latency, the years from 5 or 6 to the onset of puberty, finds the child comfortable with his primary identity and his gender. Out of this state of undifferentiated, non-responsible dependency, growth pushes the latency child to function with others. Many activities serve to separate out fundamental, functional gifts and callings of the child within a larger community, whether it is a team, the family or the work world. Both tend to gravitate toward elders of the same sex during these years as coaches, teachers, and role models. The reunion process is successful when the child can work at an adult task effectively with others.

Adolescence. The middle years, from puberty to socioeconomic independence, see an extension of both the oedipal experience and that of latency into a larger arena. Gender identity becomes sexuality, and games gradually are replaced by the real work of a person in an adult world. Separation is now from the partial, undifferentiated arena of the home, family and neighborhood. Individuation produces a person who is self-supporting and ready to establish a family. Maturity is marked not only by success in these activities but by the capacity to establish a rewarding and mutual sexual relationship with one's mate, and a new, close but free relationship with parents and siblings. For some reason this dimension of maturity, the adult relationships within the family, seems rarely considered in our contemporary society. One reason for this may be that our excessive individualism has seen adolescence only as a process of separation in the individuation. The folk drama of our day from song to soap opera, and for that matter our serious teachings, almost never model for us the delightful experience of the interaction of parent with a child who is mature.

Successful adolescence produces in the woman the competence and confidence needed to be a wife and mother and in the man the same confidence and competence to be a husband and father. In both cases they are to some extent modeling or following the scripts demanded by their roles in life as they take on mature responsibilities in the world. This role-function quality of early adulthood is the undifferentiated state out of which the next step rises.

Midlife. Separation here is into a new appreciation of our unique identity, one which includes all of those facets that have been defined in earlier identity transitions. Now each is reconsidered in order to separate out and define more sharply what is unique to this person. The fundamental sense of self, maleness and femaleness, the functions in life are all reconsidered now without the role-playing demands that these have made up to this point. Each role is reconsidered as to how well one "fits" there and this sometimes causes a radical realignment of functions within the marriage and community. The midlife "crisis" or transition centers around these issues.

Successful maturity at midlife is marked by a new sense of our own peculiar identity, often experienced as a kind of destiny, or discovering "that for which I was created." It is specific enough to help us define our task and socially migrate toward some special community that will involve us for the second half of our lives. As always, destiny is ideally seen as a new union with diversity with this community not in isolation. Again, our particular culture tends to define our destiny in individualistic terms, but those who seem to have succeeded in this endeavor testify to a new appreciation of how much we are at one with those around us.

We can define maturity as the potential a person has to be a unique individual, knowing himself as such, who is able to form growing, effective relationships with significant others.

Old Age. The transitions of old age are less well defined but seem to involve issues of our place in passing generations, our gift of wisdom, and our task of casting some light and hope back down from the top of the stairs to those along the way. Both the disintegration which we see in elderly people who are isolated from general life and the family on the one hand, and the spiritual orientation and sense of history that seems to be rejuvenated in these years on the other, testify that the successful completion of this last stage of life is also a reunion—a community affair.

Conclusion

Maturity involves a sense of our unique separateness and at the same time a firm conviction that we are so much a part of others that, as Paul suggests, we function as a single organism: "If one member suffers, all suffer together; if one member is honored, all rejoice together" (I Cor. 12:26). The latter half of this paradox is one of the best kept secrets of our age. The responsibilities we have to our own personal development, the care and edification of

those we serve, join with a deep burden of the teachings of Scripture to urge us to give more attention to our oneness, a community identity we can come to experience without losing the rich truths of individualism that have been handed to us by the thinkers of our immediate past.

[a] *On the use of the metaphor "temple" cf. especially I Cor. 3:16; II Cor. 6:16. In Col. 1:18, 24 as well as the various passages in Ephesians "body" is used in conjunction with "temple" and "church." "Body" is a metaphor of psychological relationships in Eph. 4:1-7; 5:29. Its social implications are implied in Gal. 3:28 and Eph. 2:11-16.*

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[1]Berry, C.M. *The Ethical Method of the Book of Ephesians.* Unpublished paper, Atlanta Counseling Center, 1979.

[2]During the preparation of this paper, an interesting study was published that is similar in some ways to it (Talley, 1980). The author points out that the separation-individuation process as described by Mahler involves a "separation anxiety" that has many similarities to the "estrangement" and loneliness described by Tillich. He sees that in some ways the spiritual union of St. Paul and the reunion described by Tillich are a resolution of this developmental problem.

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For most of the 20th century religion and science in this country have coexisted with relatively little controversy. Scientists did not accept literally the version of beginnings set forth in Genesis, but many were touched with awe when they regarded the order and complexity of nature. They respected the ethical values fostered by organized religion. Some scientists were agnostics, but few were atheists. This peaceable relationship has been strained by the people who allege that there is a body of knowledge which they call creation "science" that merits equal treatment with the teaching of evolution in primary and secondary schools. The efforts of the tens of thousands of scientists who have produced data relevant to the age of the earth or the universe have been motivated by a search for truth. If the age of the earth were 10,000 years or less, that result would have been proclaimed by many and accepted by all. In contrast, those who propound creationism have started with a literal interpretation of the Bible. They have no substantial body of experimental data to back their prejudices. Truth is not on their side. In the end their activities must bring back only harm to their cause.

Philip H. Abelson
"Creationism and the Age of the Earth," *Science,* January 8, 1982.

Some Implications of Artificial Intelligence Research

DENNIS L. FEUCHT

Innovatia Laboratories
5275 Crown Street
West Linn, Oregon 97068

Electronic computers have given rise to artificial intelligence research and questions about the meaning of intelligence. *A complete account of intelligence must include and adequately relate both its objective, scientific meaning and its personal, existential meaning. Also, the biblical doctrine of man is adequate in accounting for human significance in view of the emergence of machine intelligence.*

Over the last thirty years, with the advent of electronic computing machinery and its capability of performing some tasks much more effectively than human reason can, researchers have begun to inquire about the meaning and nature of intelligence and how it applies to machines. This new direction of inquiry, known as Cognitive Science or Artificial Intelligence (AI), is summarized by one of the leading researchers in this area, Nils Nilsson of Stanford Research Institute:[9]

> The field of *Artificial Intelligence* (AI) has as its main tenet that there are indeed common processes that underlie thinking and perceiving, and furthermore that these processes can be understood and studied scientifically.

Nilsson continues and summarizes AI achievements:[9]

> While attempting to discover and understand the basic mechanisms of intelligence, these researchers have produced working models in the form of computer programs capable of some rather impressive feats: playing competent chess, engaging in limited dialogs with humans in English, proving reasonably difficult mathematical theorems in set theory, analysis, and topology, guessing (correctly) the structure of complex organic molecules from mass-spectrogram data, assembling mechanical equipment with a robot hand, and proving the correctness of small computer programs.
>
> Whether the activities of these workers constitute a new scientific field or not, at the very least AI is a major campaign to produce some truly remarkable computer abilities. Like going to the moon or creating life, it is one of man's grandest enterprises. As with all grand enterprises, it will have profound influences on man's way of life and on the way in which he views himself.

In this paper, questions about the *meaning of intelligence* as it applies to machines are briefly investigated. To raise these questions is no longer an irrelevant exercise, for as Nilsson's examples illustrate, AI techniques are beginning to be used for practical purposes. Although the science-fiction scenario of society becoming captive to machines that it creates is not an immediate threat, the more subtle and insidious problems of the relation between men and machines needs to be examined.

What Does "Intelligent" Mean?

The word *intelligent* in itself is imprecise because it can be used in (at least) two quite different ways, as the following statement exemplifies:

> Any intelligent computer scientist recognizes the difficulties in defining *intelligent*. (Statement 1)

The first use of *intelligent* in this statement is a commonsense assessment of another computer scientist. Such an assessment is the product of my introspection of an indeterminate range of meanings by which I know the use of the word *intelligent*. It is by an act of personal judgment for which I cannot state all the rules by which I come to know a colleague to be intelligent.

Such lack of formal precision is an inescapable part of our knowledge.[11] Whenever we conceptualize, we strive to achieve a more objective representation of what we mean by a key word (such as *intelligent*) so that our meaning may be more accurately shared by others who accept its definition. But to *define* is to "show limits"—to reduce the

possible range of meanings a word can stand for until they are manageable. *Defining* is an act of naming—that is, of naming the essential characteristics that must be true of something before we can label it with the defined word. For example, if a *car* were defined as a machine used for transportation with an engine, four wheels, and a passenger compartment, then by this "definition" a truck could be a car because it also has all of these characteristics. Sufficient limits have not been shown since all the *essential* characteristics of a car have not been named; a *description* has been given but not a *definition*. It is still at this stage in the activity of defining, an idea and not yet a concept, because it cannot be distinguished from similar but distinct meanings, such as a truck.

This activity of striving to achieve concepts by reflecting upon ideas—by examining the results of intuition—is inherent in any scientific or scholarly pursuit. In Statement 1, the second use of the word *intelligent* is conceptual and therefore different from its first use, which is intuitive. The ultimate goal of cognitive science is the complete, or at least the essential, conceptualization of the idea of intelligence. The common-sense idea we have about it and the ways in which we use the word in ordinary speech are not satisfactory for scientific purposes and must be clarified by definition, as McCarthy and Hayes have attempted to do. They actually have given two definitions, the first conforming to the theory of knowledge (epistemology)—of determining what intelligence is in itself, and the latter, based on the operational behavior of something intelligent:[19]

1. *epistemological*—"the representation of the world in such a form that the solution of problems follows from the facts expressed in the representation"
2. *heuristic*—"the mechanism that on the basis of the information solves the problem and decides what to do"

These definitions in themselves show that McCarthy and Hayes were attempting to reduce the range of meanings of *intelligence* to a more objective status. Words such as *representation, information, problem,* and *mechanism* trigger common shared meanings in the minds of computer scientists, so that by their assumed clarity they could be used acritically in setting forth a more objective and conceptual meaning of intelligence.

Can Created Persons Create Intelligent Devices?

It is at this point that we encounter one of the main controversies about *intelligence* as it applies to machines. For some, the idea that a device created by men and devised by them for human purposes could be intelligent is repulsive and incredible. It is repulsive because it accedes to man the ability to create that which also has a characteristic of man highly valued by those repulsed. This readily implies that what was uniquely valued in man now must be shared with a creation of man. The significance of man's previously unique characteristic among creatures has been diluted. It is incredible because of a clear lack of precedent and the perceived enormity of the task. It is *not* granted that progress toward a machine intelligence will not be finally thwarted by unknown fundamental limitations, such as Heisenberg's Uncertainty Principle was to the success of a fully deterministic explanation in mechanics. And it may well be both repulsive and incredible if it is assumed on theological grounds that God's creation of intelligent beings is reserved for him alone to do. To others, namely those committed to Nilsson's main tenet, the ultimate hope and goal of AI research is a scientifically adequate understanding of intelligence, and additionally, for those involved in a corresponding technology—perhaps it could be called "knowledge engineering"—the successful construction of intelligent machines.[18] Whatever the personal beliefs of those in this latter camp are on wider issues, when it comes to their working attitude toward intelligence, they are committed to the success of their program. The implications of this attitude, as seen in the AI literature, are statements which those in the opposing camp find incompatible with their view of intelligence.[12,13,16]

Like other controversies of our day on issues with a subject-matter common to both science and theology or philosophy, I believe the basis of such controversies is often much like that between the blind men of Hindustan, each discovering for himself what an elephant was like by individually feeling different parts of its anatomy. To its own extent, the personal experience of the elephant by each blind man was for him correct, but limited. No one account of the elephant could adequately represent the experiences which led to the other accounts. A more general theory that adequately inferred the experiences of all the blind men would also render any one of their accounts as true but inadequate or even false in general.

Like the elephant, the subject-matter of *intelligence* has a different feel to different parts of its "anatomy." The meaning of intelligence to the AI community will most likely be different from its meaning to those opposed. Because the actual positions that are taken contain true, though limited, insights mixed with error, to show the essential harmony between true statements from each camp, an identification of errors is a necessary part of my program. These errors, as with the Hindustanis, are almost always in the form of excessive generalization. Along with this I hope to provide a further explication (and, hopefully, clarification) of those limited insights from each camp that I regard as true. Because of my personal orientation, two camps with which I share values, goals, and general presuppositions are the AI community and the historic Christian community. I am committed to the basic ideals of each but cannot accept all of the actual views within either community or the means by which some of these views have been brought forth. As the HAL 9000 computer from Arthur Clark's *2001: A Space Odyessy* said, "Problems like this have cropped up before, and they have always been due to human error."

The Artificial Intelligence Perspective

My program here is to first examine the AI perspective and then the biblical/theological point-of-view. To examine the main strength—and, in a different sense—weakness of attitude in the AI community, I here return to where I paused in describing the importance of striving to achieve a conceptual, scientific understanding of intelligence. The

methods of science have been unquestionably successful relative to their purpose of producing an objective, conceptual account of physical phenomena. Thus, it is fitting, given that intelligence is manifested through some physical means, to study the nature of that physical embodiment, or *cognitive mechanism* (as MacKay calls it). On the basis of scientific precedent, it is not unreasonable to hope that such an effort will be fruitful. Although the early overoptimism of pioneers in cognitive science has drawn some justifiable criticism, it is in the spirit of any grand enterprise—scientific included—to express a kind of hope equal to the immense sacrifice demanded to succeed at the task. It is this intense effort by AI researchers that is both essential to progress and, in a different way, presents an occupational hazard. For, in dwelling deeply on one's work according to the habit of mind most likely to achieve results, this habit becomes a familiar and comfortable frame in which to rest one's thoughts. On a psychological level, it is the seed for excessive generalization, since the tendency to use a way of thinking that is successful in one area of experience for dealing with *every* kind of experience accompanies intense, specialized mental effort. Of course, one need not give in to this, and personal activities which provide a healthy counter-perspective not only assuage such a tendency put also provide a wider perspective from which one's intense work can be reviewed. This balance between *reflective* and *assertive* mental activity results in a more comprehensive understanding of the varied ways of regarding the subject-matter under consideration. For AI research, the intense scientific motivation, with its goal of exhaustive formalization and objective, symbolic representation of knowledge about intelligence, may tend to lead one committed to its ideals to assume that all that may be known about intelligence can be cast in such a form. Such is not the case, and could not be even in principle.

This impossibility is not the result of incompetence of AI researchers or even of the newness of the field. It is due to fundamental limitations on the activity of conceptualizing. When one sets out to define a concept, a maze of incoherent ideas are explored in an attempt to choose those of interest and establish systematically relations to previously known concepts. In doing do, these discovered relations provide a context in which the individual ideas begin to acquire a conceptual meaning. What is already clearly known while conceptualizing is the ground against which the newly-forming concepts may be seen. This figure/ground dualism which accompanies all our thoughts is inescapable.

Because we cannot clearly hold in mind the entire set of specific potential meanings that is an idea, we are required to choose some small subset that we are capable of holding in mind symbolically. The symbol-system used is commonly our native language. In science, it is the language convenient for expressing the scientific concepts with which we are occupied. In AI research, this is the language of mathematics and also computer languages. The individual symbols that are used to represent our different meanings provide a convenient way in which to manage—to identify and categorize—the vast numbers of them that our minds hold. In language, these symbols are *words* that can trigger their corresponding meaning in our minds when we encounter them. To discover a coherent pattern of relations among various meanings, the scientific or analytic mind attempts to reduce this vast array to a form in which each can be represented by a set of clear, distinct ("mathematically orthogonal") basic meanings labeled by symbols. These are concepts from which all our other meanings may be built up and represented symbolically, resulting in an orderly pattern for our thoughts. Meanings which result from *perception* (from observing the physical subject-matter) and useful ideas from *imagining* about the subject-matter, are refined by means of reasoning (or *thinking*) to conceptual representations, which are more easily manipulated mentally than the original raw impressions.

But this activity of conceptualizing has its limits. For even our most well-established basic concepts are known to us only through intuition. The personal act of introspecting the meaning of a concept by reviewing its definition is not the definition itself. Concepts, by their manageability, provide for a more effective intuitive knowledge; but concepts cannot replace their more basic foundations in personal, existential consciousness. Even words labeling concepts must be defined using other words, *ad infinitum*. This infinite regression, which results from attempting an exhaustive conceptualization, leads back to intuitive knowledge; it

Dennis L. Feucht is involved in the development of electronic instruments with knowledge-based reasoning capabilities, in the Applied Research Group of Tektronix Laboratories. He is also developing a tactile sensor for robots, and at Innovatia Laboratories, which he started in 1978, licenses R & D in robotics. He holds a B.S.E.E. (Computer Science) from Oregon State University, 1972, and since then has designed a variety of test and measurement equipment at Tektronix.

is a kind of knowledge which is undisclosed to the knower while he contemplates the conceptual object of this knowledge.

Furthermore, this kind of intuition, or *personal knowledge*, because it is the basis for conceptualizing is unable to be shared with others or formalized in any way by the knower. To turn his attention toward it is to reflect upon his own mental activity, but even then the mental activity he has while reflecting is not the mental activity upon which he is reflecting. In choosing what to reflect upon—which of the meanings latent in an idea to select—he is guided by a purpose which arises out of personal knowledge. For the scientist, this purpose guides him in the exercise of his scientific judgment, in discerning which aspects of the problem of understanding intelligence are most germane or relevant and which data are critical or superfluous.

For those who use the word *intelligent* as I did the first time in Statement 1, regarding as essential to its meaning the inclusion of personal knowledge, then even a complete scientific account of intelligence—my second meaning for it in Statement 1—fails to include this existential aspect. The scientific account explains its existence quite adequately, but the explanation does not contain it, for it is present only in the knower himself. This personally introspected awareness, that behind my thoughts is the "I" who am thinking them, is represented in the complete scientific account of my intelligence, but is not itself there. It is this personal aspect of knowing that I recognize in myself, and by inference recognize in others, that allows me to discern intelligence and assess others to be intelligent or not, whether they be man or machine. Even if I had a reliable scientific means for impersonally determining whether a being was intelligent or not, though my scientific questioning would be satisfied by its result, I would not be personally satisfied without direct experience (through interaction with the being in question) that would provide grounds for a personal assessment.

In the early 1950's Alan Turing proposed a test, known as the Turing test, for determining whether a machine could be considered intelligent.[14] In simplified form, his test was to communicate with another entity in such a way that the medium of communication would not reveal whether the entity was a man or a machine. For example, by "talking" with this entity via a computer terminal, if one could never decide for sure whether a computer or human being was at the other end, Turing's test would indicate that the entity was intelligent.

By Turing's test, the assessment of intelligence by an examiner is based on his personal knowledge of the one with whom he is in dialog.

This difference is recognized, for example, in the German language by the use of two different words for "to know", namely *wissen*, the objective knowledge of someone or thing and *kennen*, subjective or personal knowledge from experience itself. It is the difference in knowing about someone versus knowing them personally. Both kinds of knowledge have validity as complementary aspects of the whole of knowledge and neither can be reduced to being a part of the other.

It is this irreducibility that is often not recognized as a *logical* limitation by those who prefer the second use of *intelligent* in Statement 1. MacKay[8] has shown that what would be correct for an observer of an agent—in this case a hypothetically intelligent being—to believe about him would not be both correct for the agent himself to believe and incorrect to disbelieve. The system of true statements of both the observer and agent is logically indeterminate because they reference each other in antinomic fashion (i.e., the "paradox of the liar" applies). If a complete scientific account could be given of the agent's cognitive mechanism (that is, the physical embodiment of his intelligence), the agent would be mistaken to believe it was true because by believing it, his cognitive mechanism would be changed so that it could not be the one described in the scientific account. Conversely, if the account were modified so as to come true by his believing it, he would not be mistaken to disbelieve it. In a logical sense, whether an account of his cognitive mechanism is true or not depends on whether his choice of believing it or not renders it true or false; the choice is up to the agent. Because the correctness of the scientific account depends on the choice of the agent it defines, the knowledge of the agent is not logically the same as the observer's knowledge of him. If his intelligence consists at all in what for him he would be correct to believe and incorrect to disbelieve, then it cannot be the same as a scientific account of his intelligence as known by an observer. His personal involvement in what he knows is logically not the same as knowledge of his cognitive mechanism by an outside observer.[4]

Care must be exercised in distinguishing between scientific and personal knowledge to avoid speaking of either in the wrong context. Both must be given their proper place in a theory of intelligence.

Therefore, care must be excercised in distinguishing between scientific and personal knowledge to avoid speaking of either in the wrong context. Also, both must be given their proper place in a theory of intelligence. These necessary distinctions, I believe, go a long way in resolving

some of the more serious conflicts over the meaning of intelligence.

Machine Intelligence

Thus far, I have attempted to establish the place of personal knowledge in a theory of intelligence and how its absence in a scientific account of intelligence does not reduce its necessity, logically or experientially. But what of *machine intelligence*? A machine is a humanly devised tool or artifact that is a concrete instantiation of a formal system.[7] To design and build a machine requires formal knowledge by the designer of its operating principles, and the more complex the machine the greater is this requirement. Before an intelligent machine can be constructed, its designers must have adequate formal knowledge of intelligence to embody it in a machine. Whether such knowledge is attainable is a scientifically open question. So little is known about the human brain in this context that we are left with the present achievements of machines of AI from which to venture a prediction. But such a prediction is mere speculation considering their present limited range of capabilities. In the 1960's work in AI was directed toward the development of general problem-solvers but it was learned that insufficient understanding of intelligence suggested the development of specialized, limited-domain "expert" problem-solvers. This was the main work in the 1970's (of which Nilsson gave several examples) and this work resulted in more sophisticated AI techniques.[10,17,18] Although more powerful computers increase the performance of AI programs, this increase is marginal since the order of complexity of the problems solved by the programs far outstrips even significant improvement in the hardware. What is needed are conceptual breakthroughs in AI models and computer architecture. For the AI researcher, though the scientific possibility of machine intelligence is an open question, the working assumption or belief is that it is possible and worth the effort.

The Biblical Perspective

I intend now to turn my attention largely toward the other camp, which is antagonistic toward this position of the AI community. I will dispense with all non-theological arguments against machine intelligence by reference to the classic article on this subject by Alan Turing: *Computing Machinery and Intelligence*.[14] Turing considers in his list of counter-arguments the theological argument, which largely presupposes the position of Thomas Aquinas. Aquinas, of course, stood in the Aristotelian tradition of the medieval scholastics and projects more of a Greek than a Hebrew view of man. Turing's theological commentary on machine intelligence is accordingly incomplete. I intend here to contribute to its coverage.

In the cosmogony of the Bible, man is given a unique place by God in his creation. Man's uniqueness and dignity is not threatened by intelligent machines from a biblical point-of-view since God created Adam and his descendents for purposes unique to them. Because it is with man alone that God has entered into a covenantal relationship by which man's uniqueness and significance is established, all that follows from such a relationship applies to no other entities, whether they are intelligent or not, or created by man or not. Man is given dignity and uniqueness *relationally* rather than *ontologically*.[2] If an ontological approach to this problem is taken, whereby man's uniqueness is found in what he is in himself—in some higher quality of man incapable of being shared by non-man—then further advances in machine intelligence will require finer and finer distinctions between man and machine. Whatever significance is attributed to man's uniqueness with this approach diminishes with technological progress. It is equivalent to, and suffers from the same weakness as the god-of-the-gaps approach to the problem of God's activity in the world.[3] In the context of previous discussion, a purely ontological view of man corresponds to a scientific approach, where man himself is studied and differences with machines noted. As these differences diminish, the ontological argument for man's unique place is correspondingly weakened.

This problem is also suggested by other biblical data. In the creation we find not only man and God as the intelligent beings of the universe, but also angels (and other beings as well). The existence of angels has not been viewed as a threat to man since the Scriptures are clear about their purpose. Even so, they also are portrayed as beings "higher" than man (Psalm 8:4-9). Also, since angels are not often manifest, they are equally not available for study as a machine. This may be irrelevant to those who find man-made intelligence offensive. I simply want to point out that man's uniqueness does not consist biblically in being the only intelligent creature.

As for man-made or machine intelligence, I am willing to wait for future developments. I find that the biblical doctrine of man neither depends upon nor is threatened by the possible answers to the question: is machine intelligence possible? The question is meaningful, but is not theologically critical because the validity of the biblical doctrine of man is not affected by its answer.

Although man's uniqueness is to be found in his covenantal relationship with God, how does this account for man being made in God's image? Biblically, man was created "in the image of God" (Gen. 1:27) and, according to Paul, is intuitively aware of it (Romans 1:19, 20).[1] Because the Bible is not explicit about what constitutes this *imago Dei*, the different characteristics of man to which it is attributed lead to differing views on the theological significance of machine intelligence. To see the image of God as consisting in human intelligence gives cause to view machine intelligence as a threat, but such a conception is more in accordance with Greek than with biblical thought.[6] The wholistic view of man in the Bible offers a clue to how this *image* may be recognized.[5,15]

Earlier, I argued that a purpose underlies the direction our conceptualizing takes. This purpose integrates our sequence of thoughts so that together, as parts of a whole, they reveal comprehensive features of the subject-matter we are thinking about. Further acts of comprehension may in turn depend upon previous comprehensive insights which become parts in a still larger whole. Consequently, our

understanding of the subject-matter increases in its generality, guided by our even more general purpose for understanding. It is man's recognized purpose for his existence that his relation to God is made known to him, and from this awareness follows all the more detailed levels of understanding and acting. What results is a continuum from the most basic and profound level of awareness of God as our purposive Creator, to the most immediate and direct level of physical actions by us. Body and mind or spirit are, in this sense, one comprehensive whole that is man.

Conclusion

What is meant by intelligence can be either an objective account of my cognitive mechanism or introspection of my own conscious experience. Although the former meaning is the required one for science, it is not sufficient for the intelligent being it describes. The controversies over the meaning of machine intelligence often overlook this distinction. For both scientists and those upholding man's significance (as is expected of theologians) to assume that their individual accounts are sufficient is inadequate. Both personal and scientific aspects of intelligence are necessary to a more complete understanding of it.

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A major unknown element, and the most difficult to assess, is the effectiveness of the courier-guards who accompany the (nuclear weapons and materials) shipments and the guards who protect materials in storage. How long and how effectively could they protect nuclear materials if they were suddenly and without warning attacked by a well-armed, highly motivated group of terrorists? . . .The basic elements of the MILES (Multiple Integrated Laser Engagement System) system are a laser transmitter mounted on a weapon and optical detectors mounted on a target. . . .The MILES system is designed so the probability of "kill" approximates that of a weapon firing live rounds. . . .Because the present "kill" characteristics do not always follow those of a live round, we plan to add detectors for more complete body coverage. . . .Since an arm hit with an M 16 has a probability of incapacitation of about 0.3, detectors on the arm could be programmed individually so they would have to receive three hits before the participant would be incapacitated. . . .Significant R&D efforts are underway on. . .a probability-of-kill more in line with real weapons. . . .After basic training in use of laser-equipped weapons, security groups divide into teams and take turns as terrorists and defenders. Sandia provides referees and evaluators.

"Tactical Training for Security Personnel," *Sandia Technology*, Sandia National Laboratories, Albuquerque, New Mexico/Livermore, California/Tonopah, Nevada, pp. 17-27, December 1981.

By What Authority: Verification of Theories in the Social Sciences. A Christian Perspective.

TIMOTHY SHERRATT

Department of Political Science
University of Kentucky
Lexington, Kentucky 40506

The question why is as innocent a question as can be asked in the world today but its past is murky. There was a time when it was not asked because the man and the woman walked with God. Then it was asked and sin and guilt became part of the world. Empirical verification became a possibility, too. This meant there were two ways to answer the question why. There was the eternal way of God's revelation and the new way of empirical research and verification, a way that would grow more and more attractive as the consequences of fall and separation impinged upon human life. The eternal way always appeared clumsy by the standards of the finite world—"Thomas said to him, 'Lord, we do not know where you are going; how can we know the way?' "[1]—but it retained its innocence for centuries, well into the Christian era. The eternal way is now ignored in "serious" research. The temporal, empirical way has now become dominant—and innocent. Why and how are the fairest of questions.

This paper is an attempt to probe the answers to these innocent questions as they are framed in the social sciences today.[2] I strongly suspect and gently suggest that the real inadequacies in empirical verification of theories are hidden by the dominance of so-called scientific empiricism in the social sciences, particularly in America. Approaches to theory verification that do not rely exclusively on the scientific form expand the necessary criteria for verification to the extent that they deviate from that form. If different approaches are permitted to compete on an equal footing, the task of verifying theories loses much of its apparent innocence and becomes rather confused. For a believer, the response to this suggestion is a fresh look at the eternal way. Does it resolve problems, untangle confusion? Is it a way to do research or solely a critique of existing approaches to research? What are its own criteria for verification? This paper does not decry research in the social sciences, notwithstanding the supernatural presuppositions a believer must bring to such a task. To give force to these presuppositions I have, moreover, focussed the paper on a topic of direct concern to believers. I do not presume to discuss exclusively secular topics at this stage.

"Explaining" Declining Church Attendance: An Example

Consider a phenomenon known to many of us—declining church attendance. The vestry of a large neighborhood church has commissioned a study by three social scientists to research the phenomenon and explain it to the church. The project's specifications call explicitly for an explanation and encourage the researchers to profer advice for arresting the decline. Following circulation of their findings, the three are invited to discuss them at a special session.

A Logical Positivist

The first contributor is firmly in the mainstream of social science at a large state university. His education equipped him with a logical positivist orientation to social research. He believes that social science can and should imitate the experimental structure of natural science. He leans heavily on quantitative methods, believing that these will, in the long run, yield the kind of accuracy every scientist strives for. Ever sensitive to the misleading impressions of common sense, he cherishes scholarly detachment. Objectivity, he admits, may not be fully within his grasp, but it is his stated goal. His explanation runs as follows:

"I would like to thank you for the opportunity to conduct what proved to be a most interesting study. I have

tried to address the problem of declining church attendance as dispassionately as possible but with regard for the concern manifested by this committee when we first met. Let me say right away that as far as advice is concerned, I'm afraid my suggestions may disappoint you. I am not really qualified to offer much advice. However, I have put together an explanation of the decline which has been statistically verified; it's the kind of explanation that enables you to predict fairly accurately what will happen over the next few years. I felt that if I provided you with the causes of the decline and the likely course of that decline in the future, you would have a sound basis on which to make your decisions. I see it as an advantage that I am not connected with the church. My research has always sought to place phenomena in their widest social and political contexts—whereas, I would be surprised if many of you would have the time or the inclination to see things this way. As concerned churchpeople, you have one perspective; as a social scientist I have another. So I see my contribution in these terms. I encourage you to look at declining attendance as a social phenomenon.

"These last thirty years, as you are probably aware from the popular if not the academic press, have witnessed a social revolution. I am speaking of communications. The diffusion of information—and the rate at which it has been diffused—over this period has brought about fundamental changes in society. Your congregations have not escaped its consequences. Where once men and women looked to the church for moral, spiritual and social directions, they need do so no longer for there are many alternatives to the church today. Where once societal authority was homogeneous in structure, it is now fragmented, diverse and heterogeneous. You will see from the report that I have developed and documented fully what I summarize here. Just as the proof of the pudding is in the eating, so the proof of theory is in the testing process that verifies it. The 'Heterogeneity-Communications Theory' did not prove unduly difficult to test. First, I created indices of the spread of communications—from the numbers of televisions and radios in homes; from figures supplied by the major networks which record how many watched the programs; from estimates of the numbers of journeys to and from this nation based on figures supplied by the major airlines and shipping companies. There are many aspects to communication, so I had to be sure to create a comprehensive instrument which would measure the spread of communications in a meaningful way. Again, please refer to the written reports for a full account.

"My findings show what has been generally recognized for some time now, that the past and present trend in communications development shows no sign of changing direction. In other words, communications will become more efficient in the years ahead. If my theory holds, it follows that church attendance will decline in that same period. It's a risky business predicting too far ahead, so I will not stick my neck out and say that the trend will continue indefinitely, but with things as they are, I see no reason to expect your congregations to begin growing again any time soon. But, of course, circumstances can change.

"I want to say a little more about my theory. The spread of communications was not the only social phenomenon I looked at. Another candidate is the related revolution in domestic transportation. The age of the automobile enabled people to develop leisure activities previously undreamed of—putting it crudely, they go to the lake or the golf course today instead of the church. The transportation revolution suggests a different angle on the question. It offers an exclusively social explanation. The 'Heterogeneity-Communications Theory' focusses on spiritual and intellectual causes of declining attendance. When I tested these two theories, however, my data on the communications revolution fitted—were related to—the attendance data much better than the transportation data. So, if you want to predict what will happen to your congregations, you should adopt the 'Heterogeneity-Communications Theory.' That is not to say that the other is of no use or that it doesn't tell us part of the story—in fact, there are probably many minor causes, too—but since the 'Heterogeneity-Communications Theory' fits the data particularly well, I prefer it."

So the church leaders are encouraged to predict their likely future in terms of the "Heterogeneity-Communications Theory." They have had "hard data" presented to them and have heard a persuasive argument. Happily, the Socratic tradition is far from dead even if those outside the logical positivist school are woefully underrepresented in the universities.

A Political Theorist and Philosopher

The second contribution comes from a man who wears the title "social scientist" reluctantly but tenaciously, for he is indeed in the minority both in his field of interest and in his department. Tenure was hard to come by, not because he failed to publish but, he fears, because his work is not really acceptable to the mainstream of the discipline. He is regarded as a political theorist and philosopher, and rightly so for he is both, by inclination and academic training; but this places him on the fringe of a discipline anxious to imitate the form and rigor of the natural sciences. It is not common among political scientists to have studied German sociology, with the exception of the work of Max Weber, mistakenly held to champion scientific value freedom. A student of Phenomenology, he uses language that imposes a barrier to effective scholarly interaction with his mainstream colleagues. Moreover, his background is not "quantitative." I do not recall if he gained a Bachelor's degree from a British or European university but I rather think so. He is uncomfortable with statistical methods and their use in social research. One suspects that his work reflects more than a little of his academic circumstances, but his capacity for telling critique has been developed to good effect. He is, perhaps, just the right person to discuss the first contribution.

"I'm concerned with my colleague's analysis for two reasons. It confuses prediction with explanation and it is not verified by the experience of any individual whatsoever. I can deal with the former objection very quickly, serious though it is. Dr. Anderson[3] seems to conceive of explanation as a competition between hypotheses, with the first

prize going to the best guess. By 'best,' of course, he means the one that fits his data most accurately. This strikes me as a legitimate operation only if the aim is to predict, especially if one 'cause' seems to fare so much better than all the rest. But explanation is a very different kettle of fish. It involves combination, not separation, of causes. To explain an event we have to look at everything we think is connected with that event, whether large or small, and go on to relate those causes to one another. The interactions between causes (you should understand I use the word 'cause' with some reservations) may give the little causes an importance out of all proportion to their size. We have an example before us. My own researches show that your denomination adopted a somewhat lukewarm stance towards those ministers who used radio and later television to extend their ministries in the thirty years the so-called communications revolution occurred. In other words, your style of ministry didn't change much at all during this period. Taken in isolation, the very slight increase in radio and TV ministry that did take place would not appear to be very important. Statistically-speaking, there may be a relationship of sorts between that increase and the decline in attendance—and it makes sense that some people may have stayed away from church when church was brought into their homes, so to speak. But in the rough-and-tumble competitive world my colleague has created, this hypothesis would fare very badly. However, and I cannot emphasize this too much, in its proper context, in combination with the communications revolution that swept the secular world, this little cause acquires a mighty significance. The world moved ahead, the church hung back; the psychological impact alone must have been staggering.

"So much for the confusion of terms. Dr. Anderson offered some good ideas and I think they are all plausible to some degree. But he offered them as predictive devices, not explanations. Predictive devices may do that job very well while being totally devoid of theoretical or explanatory value. One need not be a political scientist to create a model that predicts votes in the Congress of the United States with at least 50% accuracy. Two palpable falsehoods will suffice. If I predict votes on the grounds that all congressmen either vote randomly or vote with the majority all of the time, the results will be at least that accurate. In practice, the latter model does very well; it's accurate about 75% of the time.[4] Yet these are not theories or explanations; in fact, they are totally atheoretical. The choice of a theory, then, based on its predictive capacity rather than its explanatory power must be viewed with the greatest caution. Which brings me to my second objection: on what grounds can my colleague's 'explanation' be verified—how can we know that the 'Heterogeneity-Communications Theory' gives a valid account of what has really happened? I am disturbed that a social scientific exercise should have ignored its human subjects so completely. Nowhere do I find a reference to the participants—those who have left the church, those who have remained—to provide a meaningfully adequate verification of the explanation which has been imposed upon them. I have tried to redress this imbalance in my own research.

"People are my focus. As you know, I spent some three months in this community, learning about it, becoming a part of it myself. This was the way I collected data. I talked to people everywhere, in shops and bars and factories, as well as in many churches. I talked with the young and the old, to former churchgoers and to those who still attend. The result is an explanation from the actors' perspectives, as the sociologists would put it. As you may imagine, no single theme underlies these accounts but several different perspectives are represented. Many people referred to the problem of time and how rushed they are nowadays—how 'getting on' leaves so little time for traditional activities. Time constrains me, too, but you can read the account in full yourselves. My principal conclusion is that the cause of declining church attendance was first and foremost psychological—as you would expect with human subjects. When I discussed the church's message, the majority applauded it—said they agreed with it—but felt that they couldn't afford a commitment to the environment in which it is preached. What they saw was a good message that was static in a dynamic world. You can see what I'm driving at. I do accept that the 'Heterogeneity-Communications Theory' is important because it appears to have created these perceptions—but only in conjunction with the church's response, or lack of one, to the communications revolution. This only underscores the point I made earlier; you have to use the right criteria for verifying theories, namely the human subject. The whole thing turns on human perceptions, so we have to involve humans in the testing of the theory. Max Weber called this the criterion of 'meaningful adequacy.'

Timothy R. Sherratt was born in Badminton, England. He is presently a PhD candidate (expected completion in fall 1982) in political science at the University of Kentucky, with interests in American political parties, political thought and American history. He graduated from Oxford University in 1975 with a Bachelor's degree in philosophy and politics. A British citizen, he has lived in the United States for the last three years. He grew up in the Anglican church and has been a committed Christian since 1973. Christian education has become a major concern of his in recent years and he anticipates an increasing involvement in that field in the future.

"That's not quite the end of the story. Many of those who remained in the church have done so for the same reasons. They see the world changing and the church not changing—and they like it that way. A lot of people told me they found great security in something that endured. Just what endured? Well, that varied; for some it was the institution, the ritual, the form of the services. For others, it was their own faith that didn't change. And some said simply that God didn't change, and let it go at that.

"You know what I am going to say—if societal change (the communications revolution) produces both these reactions, the explanatory power of Dr. Anderson's theory is extended, but its predictive capacity is challenged. He suggested to you that you move with the times to arrest further decline and painted a pretty gloomy picture. If you do that, I argue, you run the risk of alienating those who remain without winning back those who have left. You have to use the right criterion for verification, you see, or you could be severely embarrassed. I recommend you discover the needs of your congregations and synthesize the church's message with those needs. The interaction of clergy and laity offers a solid base for retaining your present membership and building for the future."

A Marxist

Good Hegelians are now awaiting the synthesis; they will not be disappointed. Yet, as he follows Dr. Anderson and Dr. Brett, Dr. Chandler's presentation is a synthesis of orientation and method, not of substantive conclusions. Our third social scientist prefers the title "critical theorist" but like Dr. Brett guards the designation "social scientist" jealously. He, too, is in a minority but his Marxism sets him apart from the mainstream not on grounds of method (he will talk statistics with the statistically-minded and human intentionality with the Phenomenologists) but on grounds of political interpretation. His use of methods is eclectic because methods are his tools and his ideology is their master. He is, in general, critical of mainstream American political science because it is uncritical toward American politics. He knows that his colleagues have the good sense not to "bite the hand that feeds them." Sometimes this leads to jealousy but for the most part he has a benign contempt for their work which he believes is irrelevant to the real world of politics. On a personal level—he can get along.

"Ladies and gentlemen, I'd like to thank you for the opportunity to present my findings in the church attendance project. I have listened with interest to my two colleagues and would like to address my opening remarks to their conclusions. I can only agree with Dr. Brett's criticisms with regard to the difference between prediction and explanation and feel no need to amplify his remarks. He drew the distinction very clearly. However, Dr. Brett's conclusions do not satisfy me. Important though the 'actors' perspectives' are, they do not satisfy the verificational criteria. Participants' perspectives are not lily-white. Participants can be wrong. Countless examples come to mind from my own study of labor-capitalist relationships. Time and time again, management has argued for reduction of the labor force on the grounds of efficiency and economies of scale. The public relations people convince the workers that 'economic reality' demands such cuts, that efficiency is their sole rationale. Now ask the workforce what is going on—obtain the actors' perspectives—and they will tell you about rationalization and efficiency. They may be reluctant to accept such 'facts' but they will believe that they are precisely that, facts. Yet studies have been showing what Marxists have held all along, that management's real goal is not efficiency but control.[5] We don't live in an egalitarian society but in one whose prior structure sets up the conditions for control. Management has the power, the public relations expertise and the motive to control that version of reality which the workforce believes. So, as a general statement, let's not kid ourselves; let our standards of verification derive from a radical understanding of what's actually happening our there. Face-valuism, if I may call it that, is not verification.

"Dr. Anderson's theory seems to me to be an empty shell, the husk of something much more substantive. He has provided us with a theoretical framework that fails to take into account the structures prevailing in society for the period under study. We can conclude from his research only that something called a communications revolution took place. Well, most of accept this already. But what is a revolution without its human agents? You think I am about to repeat Dr. Brett's point? By no means! He was right to say we should talk to them, but we should classify them first. He missed all the important people. All he did was to talk to the passive victims when he should have been talking to the leaders of the revolution. Of course that would have been very difficult—they don't live here but are spread everywhere, especially in the Western capitalist system whose revolution this is. The indices which Dr. Anderson created are valid ones and I applaud the ingenuity which went into their creation. They are misleading, though. They suggest that the communications revolution was and is self-perpetuating. At face-value, what could be political about the rate of increase of TV purchases or the opening of new routes by airlines? Face-valuism is dangerous for they are political acts in two senses. First, the spread of communications was brought about in a capitalist context—capitalist organizations put up the money for all stages of the revolution. The mass of business ventures which made up each stage reflect enduring political realities. Of greater importance, especially in the media context, is what flowed along these channels of communication. It seems to me unnecessarily naive to ignore the context of communications, given the powerful capabilities of such widespread revolution. Advertising is not a multi-billion dollar industry for nothing. The communications revolution makes most sense in a context of power.

"Dr. Anderson subsumes the impact of the revolution under the heading 'heterogeneous.' He doesn't discriminate between different types of stimulus which make that impact so diverse. He does note that authority structures have been fragmented, implying that the church could command respect prior to the revolution. One would have to

conclude on such assumptions that the presence of alternatives in large enough numbers is sufficient to undermine the church's authority. I must agree with the assumption. Hard as it is to pin down intentions and motives, the communications revolution has been and continues to be a capitalist revolution. The church may not be an indispensible ally of Western capitalism but it has with few exceptions barely raised its voice in protest against capitalistic society. Given the control exercised by the capitalists over the media, why should one anticipate that the revolution would do harm to the church? I contend that such grounds do not exist.

"My critique of the studies already presented has brought me to the threshold of my own conclusions. I hope I have made it sufficiently clear, in passing, that I regard the data-gathering of both my colleagues as useful. Both studies fail in their interpretations. As you know, I did not collect data independently but relied upon my own theoretical perspective to achieve a radical interpretation of that which is before us. From the figures on attendance you supplied, it is clear that the declining number of youth enrollments is their most striking feature. There is, if I may draw the analogy, a sin not of commission but of omission! Those who never join make much more difference over time than those who choose to leave the church. So the focus must be on the young. Has the communications revolution affected them? Have they learned new philosophies, new norms and values from the spread of communications? The answer is yes, but that's only half the story, for they were able to do so long before the present revolution. In the United States, universities fulfilled this role a century or more before one home in two possessed a television set. The revolution actually underscored an old association. The young came to see who it was who controlled not only the means of production but the organs of public relations and communication, too. The revolution declared to our young people, in effect, 'Look how little has changed in society—look how little is likely to change. The rulers of yesterday hold the reins of power even as progress is made. And the church; guilty by association. She, too, stands for those same static values.' I have reached the opposite conclusion from Dr. Anderson. He assumed that your congregations, and your potential congregations, were bombarded with challenges to the old authority, and rejected it under these new pressures. I have argued that the communications revolution conveyed a very different message; the *status quo* still rules. The young have chosen to reject it. The revolution was and is an unwitting lesson in political awareness.

"The structure of my presentation anticipates my advice. The church must declare her allegiances, her goals and her standards. She must tell the world if she is a friend of the poor or the rich, the oppressed or the oppressors. The Bible speaks of a chosen people who set themselves apart to do God's will. If I understand the gospel correctly, the will of God is to 'do justice and to love mercy and to walk humbly with your God.' Guilt by association may be unfairly deserved but the church must convince the people that this is so."

We must imagine, at this stage, that our three social scientists are given the opportunity to clarify their positions and to reply to criticism. In fairness to them (I would not like to be accused of creating straw men) we must expect the defense of each report to be eloquent and forceful. The most lively debate arises over the focus and goals of the whole church attendance project as one calls another to task for a difference in emphasis, for an omission here and an arbitrary assumption there. For the moment, however, we must leave them to their debate.

The Question of Verification

In social scientific terms we have heard the statements of three "paradigms" (approaches, schools, perspectives) of social research; in order, the Logical Positivist/Empiricist; the Historical-Hermeneutical (sometimes called "Traditional"); and the Critical. I have endeavored to show that the differences between them rest variously upon methods, goals, perspectives and interests. (Methodical differences alone permit the common labelling of the first two paradigms "quantitative" and "qualitative," but as we have seen, the methodical division does not carry over into the third paradigm which draws on both types of method). The difference between the Critical school and the other two is, significantly, one of verification, and I wish to dwell on this for a moment.

Social science is ridden with dichotomies as the scholarly differences in perspective have become political divisions in social science departments and journals.

Remember that the Critical theorist rejected both Dr. Anderson's statistics and Dr. Brett's participants' perspective as adequate criteria for verifying their respective theories. Dr. Chandler found them inadequate because they ignored, or at least failed to reflect, what he asserted was "really going on." Dr. Chandler's theory involved the imposition of a radical political framework upon the events his colleagues had described. One might protest that he prejudged the phenomenon of declining attendance without regard for verification of his viewpoint, and indeed, with very little reference to the actual data. Insightful though his interpretation was, it substituted, in effect, definition for verification. When Dr. Chandler chided his colleagues for inadequate criteria of verification, he placed his own theory

outside the bounds of their sort of verification. Neither statistical results nor human perceptions can cross-check the radical critical theory, except perhaps at its periphery. Take Dr. Chandler's assertion that declining church attendance reflected the failure of young people to join churches. If the church's annual figures had shown a stable or increasing rate of attendance by this age-group, Chandler's interpretations would have escaped unscathed. Presuppositions, like most classes of assumption, are protected from direct sorts of refutation by their very status.

Dichotomies in Social Science

Social science is ridden with dichotomies as the scholarly differences in perspective have become political divisions in social science departments and journals. I believe that the focus of writing on these dichotomies has been misleading. The Logical Positivist and Historical-Hermeneutical paradigms have been the traditional enemies, yet, as we have seen, they are solidly empirical. Neither rely explicitly on imposed political definitions. The significant dichotomy from a Christian perspective especially separates empirical approaches from radical ones. By "radical" I mean that which presupposes a definition of real from the *roots* upward. It is important to stress that this radicalism divides approaches not people. Drs. Anderson, Brett and Chandler may all be Marxists but only Dr. Chandler's approach used Marxist presuppositions as an essential and explicit element of the research process.

It is, perhaps, natural for a scientist to be uncomfortable with the foregoing dichotomy. For it raises the most elemental of questions, "What is my ultimate purpose?" Let me approximate the collective response of scientists to that question, namely, "To give an accurate account of the world for the betterment of mankind." The first goal appears to be within the grasp of empirical approaches, while the second, although patently normative and subjective, is assumed to follow from it. The real crisis for the empirically-oriented social scientist (I think that's all of us social scientists, incidentally, Christians included) is that the second goal invades and appropriates the first; accuracy presupposes a reality about which statements of truth are possible. Researchers cannot avoid these presuppositions, whereupon the radical paradigm invades and enslaves the empirical ones. (If it doesn't enslave them, it renders them bankrupt). Relevant inquiry, in this realm of ultimate questions, must move from empirical verification to some more appropriate standard. The question is, what constitutes such a standard?

An Appropriate Standard of Verification

The radical nature of Christianity qualifies the Faith for an important contribution to this search for an appropriate standard of verification. There are two grounds for this qualification. The first is the human's capacity for belief. It may seem a little redundant to cite Christ's words, "blessed are those who believe but do not see," but biblical affirmation of this capacity is essential. The context, of course, is Thomas' unbelief and we should remember that the empiricist Thomas we find in ourselves is capable of entry into paradise, too! But the point is that radical belief is a legitimate human activity. Of greater importance is the content of that belief, the manner of its exercise, to which I now turn.

The Biblical account of the creation and fall of man establishes a relationship in which God initiates and man responds, receiving things from God. God's initiatives may be designated "events" and his actions as "things" in the temporal sense. However they are perceived, their underlying principles should not be overlooked. Hence man's tragedy at the fall is that he loses the precious, given knowledge of himself in God. The fall only underscores the fact that Calvary and Pentecost are received by men and women with empty hands and empty hearts. For believers, the possibility of faith and the revelation, initiation and giving of God constitute the core of their radicalism.

Is "given in Christ" any different from "given in Marx," conceptually? As far as the capacity to believe (the radical medium) is concerned, certainly not. As far as the content is concerned, certainly. The Marxist account(s)[6] of the world, radical in their medium, are reducible in substance. Built negatively upon a capitalist base, their deterministic superstructure is not metaphysical but a combination of the radical and the empirical. Christianity as radicalism is not reducible because the human hands and hearts are empty and God is unchanging. He has no empirical referent other than Himself. Theoretically at least, a Christian's radicalism is not compromised by a fallen world, for it is radical in medium and metaphysical in content.

A Christian Response

How then, would a believer fare in a radical account of declining church attendance; how would he or she evaluate the three explanations already given? Fortunately, a Dr. Dell provided such an evaluation at a later meeting; this is what she said:

"I find Dr. Anderson's study very valuable despite the unfortunate restrictions he placed on it by insisting that his theory have predictive capacity. It is significant, perhaps, that the rest of us have built upon the empirical foundations he provided. Even though Dr. Brett was moved to create an additional set of data (in the form of interviews), he did not discard the first set. Since my own task is to evaluate critically the results of this project, I feel bound to point out that critical evaluation cannot be substituted for research. On the contrary, such evaluation cannot exist apart from the empirical world and the statements made about that world.

"I must make a related point about verification which has become the *cause celebre* of the entire project. If we accept for the moment that the three paradigms represented in the study are closed and independent systems addressing relatively limited contexts, the question of verification becomes one of selection—choose the appropriate test, whether a test statistic, a participant's perspective or a

radical world view, and proceed accordingly. Were it really possible to erect barriers in the world corresponding to those that rise on account of one's approach, respective techniques would be protected.

"Let me make a related point. As we were listening to the three of them, I suspect that a false idea suggested itself, namely that each account improved upon the last. Such an effect, it must be admitted, was merely a function of the order of play. A Critical theorist like Dr. Chandler has just as much difficulty getting his fellow social scientists to accept his criteria as they had persuading him that objective science or phenomenology possessed valid criteria of verification. I would have to reject the attractive idea that there is a hierarchy of paradigms. Far from it. If today's radical perspectives are really no more than yesterday's deterministic empiricism, the alternative seems to be a dichotomy, not a hierarchy. Christianity is significantly 'other-worldly'—that's the difference.

"Social scientists have all but admitted their inability to build a grand theory from which the specific details of a science of society can be deduced.[7] This is tantamount to confessing an inability to address ultimate questions. From a Christian standard of verification (radical of medium and metaphysical in content) such a social science cannot be conceived of—it wouldn't make any difference what methods were used, either. For, if such a science could satisfy the Christian standard, it would have abandoned inductive-deductive empiricism and placed God at its center. We would call this, not a science, but the eternal way. The eternal way, however, can only be approximated by fallen mankind under the blessings of Calvary and Pentecost.

"This point needs particular emphasis. The Christian standard of verification is intolerably high even for Christians. St. Paul reminds us that 'We see through a glass darkly,'[8] Isaiah declares that our ways are not His.[9] A Christian world view is one enjoyed perfectly by Christ alone. The significance of being Christian is that it endows the researcher with a critical faculty that demands satisfaction. Such a faculty frames both the question and the interpretive work of the Christian scholar; in secular work this will be generally the case, in religious work specifically also. A good example of the sensitivity employed in this kind of writing is Charles Williams' history of the Holy Spirit in the Church, *The Descent of the Dove.*[10]

"Christ has been called by many titles, but 'social scientist' is one of the more unusual of them. It is appropriate, however, because his knowing the world is, for the Christian, the only real knowing of it. This does not render social research as we know it useless or redundant. Instead it places that research in a perspective that is of great value to the social scientist if he is willing to make use of it. Christ tells the social scientist that social science is limited, that it is unable to draw confidently radical conclusions about society. At the same time, Christ challenges the social scientist to strive for those conclusions. The radical Christian position on verification is the most valuable of contributions to secular knowledge.

"In this matter of church attendance—I expect you wondered when I was getting back to that!—this body of believers is in a position to rectify the deficiencies of three studies which have helped us considerably. Most research is performed so that someone can act on its findings and we can act up to the limits of our beliefs. The three have challenged us to identify ourselves in terms of our beliefs that are indeed radical. As to what is 'really going on' behind these figures, I have more ideas than I did but I'm not sure. Our hearts and hands are empty at this point. But we have the vast resources of prayer available to us. The way of prayer is the way to a radical understanding of our problems. Without prayer, we cannot expect to gain the kind of understanding that will lead to the right actions on our part. If I may put it this way, let us not abandon the resources of our radicalism. Shall we pray....."

REFERENCES

[1]John 14 v 5, *Revised Standard Version*

[2]The acquisition of innocence by the empirical way cannot be fixed at any one date; but the Age of Reason gave it political significance.

[3]Drs. Anderson, Brett, Chandler and Dell are, of course, fictitious names.

[4]See Herbert Weisberg, "Evaluating Theories of Congressional Roll-Call Voting," *American Journal of Political Science,* Vol 22, #3 (August 1978).

[5]See, for instance, Steven Marglin, "What Do Bosses Do?" *Review of Radical Political Economics,* Vol. 6, #2 (Summer 1974), pp 60-112.

[6]One must do justice to variants of Marxism by a plural designation, especially the flexible versions of Antonio Gramsci and Raymond Williams, to name two.

[7]The call for theories of the 'middle range' was first made by Robert K. Merton in *Social Theory and Social Structure,* Glencoe, Ill, 1949.

[8]1 Corinthians 13 v 12, *KJV*

[9]Isaiah 55 v 8

[10]Charles Williams, *The Descent of the Dove,* (1939) Living Age Edition, New York, Meridian Books, 1956.

Security and Morality in Planning For U.S. Defense

JAMES W. SKILLEN

Department of Political Science
Dordt College
Sioux Center, Iowa 51250

There can hardly be a greater challenge than to address some of the burning ethical questions that arise in the context of contemporary U.S. defense and energy policies. It is a challenge, however, that one should approach with as much care and caution as one would approach a complicated diplomatic mission; it is so easy to be misunderstood, and there are so many different views of the matter. Though it would be helpful for the purpose of clarifying many viewpoints, I do not intend to review here the history of the debate between moralists and pragmatists, between idealists and realists. It is enough to say that U.S. foreign policy-making has, for the past forty years, been dominated by what passes for "realism". This means that many so-called ethical questions have not received serious attention from those who are responsible for constructing pragmatic policies for current situations.

Even in many religious circles an attitude dominates discussion and decision-making that corresponds to the title of one of Reinhold Niebuhr's books: *Moral Man and Immoral Society*.[1] It might be quite legitimate and realistic to discuss the moral responsibilities of individual persons, according to this attitude, but it is quite another matter when social institutions and states come into view. Society, especially international society, is not ordered by submission to those moral norms which individual consciences might acknowledge.

But must we simply accept this framework of current debate as our unquestioned point of departure? Does it go without saying that we must act and think "realistically"? What does it mean to be realistic today? Are the leading pragmatists in the Defense and Energy Departments truly realistic? It is important to raise these questions because much depends on our point of departure in approaching the complex issues of defense and security. Let us look for a moment at the so-called realist argument.

The "Realist" Argument

Morality, the realist argues, is a personal thing that has meaning only if individuals can be held accountable for their acts. Within ordinary societies there are countless human communities and religious systems from the family to the courts, from the schools to the churches, that accomplish precisely this function of holding individuals accountable. But states are not individuals, in the first place; and in the second place there are not sufficient numbers and kinds of supra-national institutions to hold states accountable to and for one another in relation to some universal, supra-national, moral principle. If a state were to attempt unilaterally to act on the basis of a moral code that is applicable to individuals, it would very likely run into the greater evil of endangering its own existence and thus the very lives of its citizens. Consequently, so the argument concludes, states must act as states, not as individual persons, and the result might at times appear to be quite immoral from the vantage point of the moral individual.

There is more, however, to the realist's argument. Having established what appears to be the impossibility of a completely moral state in the international arena, the argument goes on to try to legitimate a state's seemingly immoral actions on the grounds that states have no choice but to seek their own survival and self-interest. Whether one believes that self-interested acts are the result of human sin,

or whether one simply recognizes the reality of self-interest on empirical grounds, it remains the case, so the realist argues, that such is the *reality* of the international arena and states do not have the freedom to act as if this were not so.

But think now about what was just said. How was the state described in the last few sentences? What was assumed about how states are compelled to act? The word "self" was used several times in connection with the idea of "national self-interest." And the word "act" was used, clearly revealing that states act as integral entities, making certain policies that express the state's "will." What is the meaning of these terms? If states cannot be held accountable as moral persons, can they be accepted as *immoral*, or self-centered persons? If states are not "selves" capable of moral acts and responsibilities, then why should we grant that they are "selves" allowed to act immorally?

What has happened, you see, is that a framework of moral meaning has been rejected on the grounds that the state is not a moral agent; but at the same time a framework of personal, behavioral meaning has been retained (however analogically or metaphorically) in order to explain and interpret a state's actions in the international context. And in this context a state's "self-interested actions" are then justified as necessary and legitimate. While our attention was focused on the question of morality, we were led to believe that states cannot be expected to act always according to moral principle. But if we turn our attention to the meaning or "person," "self," "will," and "act," then we can see that the question of morality and immorality is not the primary issue; for the more fundamental question is about two different kinds of "persons" that can "act," and about two different sorts of principles that ought to guide them, given their respectively different identities. States are not individual persons; international relations are not the same as interpersonal relations. But states do have responsibilities, and their leaders must constantly make judgments about how they *ought* to act. Our conclusion, then, is that political and military questions are unavoidably and inevitably moral questions: not questions of individual morality, but questions of political morality.

Upon closer examination, in fact, we find that the realists have not relinquished morality and normativity at all. They have always argued quite vigorously about how states *ought* to act in order to preserve their own interests and in order to preserve as much international peace and stability as possible. Realism, therefore, is clearly not opposed to moral judgments; it has merely tried to free itself from a certain kind of idealistic moralism that it finds unacceptable. It has tried to erect a framework for making political judgments in the international arena which can legitimate self-interested acts on the part of particular states. Realism, then is a moral philosophy which provides a rationalization for states to act pragmatically in their own interests.[2]

Unfortunately, many realists have become confined by the restrictions of yesterday's moral assumptions and judgments because they have become uncritical pragmatists. Thus, all their efforts at pragmatic and technological adjustment do not take them deeply enough into a reassessment of the full human meaning of international politics. In the name of realism they have refused to continue the ongoing moral debate about what government responsibility should be in the international arena today.

Use of the slogans "realism" and "national interest" does not in itself guarantee that political reality is being dealt with in the best way possible, either realistically or ethically.

It seems to me, therefore, that we must reject the problem in the way that contemporary realism and pragmatism pose it for us. Use of the slogans "realism" and "national interest" does not in itself guarantee that political reality is being dealt with in the best way possible, either realistically or ethically. To argue that a certain defense policy will serve the national interest does nothing to unveil what is meant by the national interest or why that interest *ought* to be served in that way. And if at a particular time in a state's history a foreign policy consensus does not exist, then the debate required at that moment will have to be a debate about the whole meaning of political reality, including ethical principles and moral purpose as well as technological limits and shifting power alignments. For us to take up questions of an ethical nature, then, is not an illegitimate intrusion into the realm of hardnosed politics where ethics doesn't really belong. Rather it is an essential exercise within the human domain of political reality—a reality that is always a realm of responsible action where questions of principle must be raised.

In what follows I want to make a case for why we need a somewhat different outlook on, and approach to, U.S. foreign policy, particularly defense policy. My contention is that U.S. defense policy is currently being fashioned in far too restricted a framework due to the inadequate moral/political vision that we and our political leaders generally accept. What is that restricted vision and why is it inadequate?

Contradictions in U.S. Policy

Let us begin by noting some of the inconsistencies and contradictions in U.S. policy. There is, first of all, the growing recognition on many sides that an increasing number of international problems are political and not merely technical. Yet so many of our approaches to (and expenditures for) those problems are guided by the hope of

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technological solutions, especially *big* technological solutions. As Air Force Secretary, Hans Mark argued, for example,

> we must make a conscious national effort at technology development, aimed at reindustrializing the U.S. and modernizing our industrial plant. We must start with people, and, once again, in the long term, make it attractive for them to go into technical and engineering fields. We must then play to the strengths of those technologies we already have where we now lead; that is, aviation, electronics, synthetics, and so forth, and make a conscious effort to develop new ones where we have serious problems. I firmly believe that this is the only way we will retain our position as a major nation.[3]

But haven't we learned from our lack of military success in Vietnam and from the Shah's downfall in Iran that massive military machines and technical superiority are not enough to keep a state strong and healthy? If an MX missile system undermines the confidence of many citizens in the western United States, destroys a delicate environmental balance, and fuels inflation with its billions of dollars of expense, will the U.S. be a more secure place to live? Is big technology the first and best hope that we have, or is it a quickly chosen substitute for political sufficiency and wisdom?

Consider another contradiction. Supposedly our defense policy is built on the commitment to non-proliferation of nuclear weapons, yet global proliferation grows at an alarming rate and the U.S. spends billions more each year on the further development of its nuclear capability, both for military and domestic energy purposes.[4] Which will it be?

A third inconsistency concerns the quest for invulnerability in defense. In an absolute sense invulnerability of a state to nuclear attack cannot be attained or guaranteed by purely military and strategic means, yet our defense research and testing continue to follow precisely that ever receding goal of ultimate security. Deterrence is by its very nature a strategy that cannot be guaranteed of success. Moreover, if the Soviet Union or any other country ever decides to unleash a nuclear first strike against the U.S., or if a conventional war escalates to the point where nuclear weapons begin to be used against us, there simply is no way for the U.S. to guarantee its security. These are simple facts that cannot be ignored. But what did then Defense Secretary Harold Brown say in 1980? In quest of the impossible goal of guaranteed security through greater and greater technological efforts and expenditures, Brown argued: "We must have the forces, contingency plans and command control capabilities that will convine the Soviet leadership that no war and no course of aggression by them that led to the use of nuclear weapons could lead to victory, however they may define victory."[5] But when will we ever be certain that we know that the Soviet leaders know that they cannot win any nuclear war? We don't have that assurance now, apparently, so what will it take for us to obtain it?

Brown's argument is caught in the inescapable trap of what John Herz has termed the "security dilemma." Striving to attain security against attack by an enemy or potential enemy, states "are driven to acquire more and more power in order to escape the impact of the power of others. This, in turn, renders the others more insecure and compels them to prepare for the worst. Since none can ever feel entirely secure in such a world of competing units, power competition ensues, and the vicious circle of security and power accumulation is on."[6] Our growth in armaments, designed to convince the Soviets that they can never win against us, only proves to them that their own worst fears of our aggressive intentions are true.

U.S. defense policy is rooted, supposedly, in the assumptions that a nuclear war should not be started, that nuclear war will be nearly impossible to control, and that a nuclear war probably cannot be won. Yet actual spending and strategic planning give every indication to an enemy that the U.S. might act as if those assumptions are not true. Secretary Brown said that our current defense expenditures must be predicated on the assumption that the "Soviets may not believe that nuclear war is unwinnable," and thus we must plan for "more—and more selective—retaliatory options."[7] But what impression will such deeds actually convey? Our deeds of strategic enlargement suggest that we will not act as if a nuclear war is unwinnable as long as the Soviets do not think that it is unwinnable. Such an approach obviously suggests that we are prepared to act as if a nuclear war can be won or at least not lost. Given that logic, however, there is no way to avoid the conclusion that what we say contradicts what we do, and deeds always speak louder than words. The Soviet Union and others, even our allies, will have to take into their calculations, as they are now doing, the fact that the U.S. is increasingly acting as if it must plan to fight and win a nuclear war, with its own interests the only ultimate concern. It doesn't take much reflection to see that security is not guaranteed by that process. Bernard T. Feld of MIT says that the only possibility for real arms limitation, and thus for real security, is for the U.S. and the Soviet Union to agree to a no-first-strike posture.[8] Is the U.S. doing everything within its power to help bring about such an agreement at this time?

A False Ideal: Being Number One

All of these contradictions, bring us back to the question of why? What is the source of these contradictions, and is there anything that can be changed to allow for a less contradictory or more consistent defense policy?

The key to understanding our predicament, I believe, is to recognize that U.S. citizens, government leaders, and defense strategists have, by and large, accepted a false *ideal* that plays havoc with any *realistic* and *ethical* planning for U.S. security. We have committed ourselves, our country, to a misleading quest—to a program that simply cannot be fulfilled. That ideal, that program, that quest is to try to guarantee American preeminence in the world—to try keep America Number One.

Let there be no misunderstanding of what I am saying. I am not arguing that we should aim to be Number Two, or Number Ten. I am not arguing that the U.S. should unilaterally disarm and pretend that power alignments and defense positions don't matter. I am not arguing that it would be better for someone else to be Number One.

No, my argument is that a state should not allow a cer-

tain power status to function as an aim of its foreign policy. The relative status of any state, whether a minipower or superpower, cannot be obtained by its own intentions and designs. A state cannot become Number One nor remain Number One by an act of political or military will, anymore than a person can become happy or remain happy by an act of will. Personal happiness is a by-product of other aims in life; it is a consequence of a host of interrelated factors that an individual can never entirely control. I might decide that I am going to be happy today, but a falling board or a slippery sidewalk might put me in the hospital with a devastating sense of unhappiness.

The U.S. did not become a superpower or the Number One state in the world by an act of its own political will. The interpretations of how and why the U.S. has become so powerful are numerous. Some emphasize the expanding economic interests that motivated American leaders, especially after the great depression. Others stress the almost accidental character of America's rise to power following World War II when the U.S. filled much of the power vacuum left by the devastation of Europe and the collapse of British, French, and other European empires around the world. Still others are impressed with the radical change brought about within the military bureaucracy and the executive branch of the federal government following the development of nuclear weapons. All of these, along with other factors, must be taken into account in any effort to understand the historical context in which we are examining the legitimate aim of American defense policy. What is certain, however, is that the U.S. government did not and could not have become Number One simply by deciding to do so. And now the question is whether the *aim* of keeping that status does not function as a misleading aim that keeps us from dealing properly, realistically, and ethically with reality. Let me pursue that question by means of six other questions.

1. *Are nuclear weapons something that the U.S. can develop, control, depend upon, and use in a way that enhances its own interests and guarantees its present status in the world no matter what others do?* Can the U.S. simply aim for its own preeminence in this regard? Of course not, and all the U.S. efforts to establish multilateral treaties limiting or banning nuclear weapons demonstrate its awareness that its own interests and status are tied up with the common interests of all states. The real question is whether the U.S. is pressing for arms control and reductions with the same vigor as it is attempting to stay ahead of everyone else in nuclear technology. It not, and if contradictions between these two aims appear, then which one should give way to the other? If U.S. nuclear power remains Number One, it should be only as a result of another aim—namely, to limit and reduce the possibility of using nuclear weapons in war. But it might very well be that the U.S. does not have to remain Number One in nuclear weapons technology and strategy to help bring an end to the nuclear arms spiral upward. In fact, its very effort to remain on top might be standing in the way of a new and better strategy for limiting proliferation and the use of nuclear weapons.

2. *Can the U.S. seek its own interests first or maintain its Number One status in a multipolar world by remaining permanently organized for war, even if most of the wars that it might enter are likely to reduce its relative power and wealth?* No, of course not! The Korean Conflict did not diminish Chinese or Soviet power and enhance U.S. power, but only aided the military growth of both communist giants. Vietnam did not prove that America is pre-eminent, but showed that a certain kind of guerrilla warfare can outlast and wear down the most powerful military machine under certain circumstances. Massive military preparedness, even when necessary, cannot assure a country that its own interests will be served or that its Number One status will be maintained. Other goals and purposes must be sought by civilian and military leaders. Even within the military, many other aspects of strength must be considered besides the advanced technological character of *big* systems. As Pentagon advisor, William Kaufmann pointed out, "the Iran and Afghanistan crises lie outside the area where strategic nuclear weapons are of any use." The U.S., he says, should "drop the pretense that nuclear weapons will somehow extricate the United States from the confrontations and hazards of the future."[9] The point is that strategic and conventional war machines, even if Number One, are not enough, and in the absence of other aims and wise strategies in an interdependent world, those machines might even be a hindrance to real peace and security.

3. *Can technological growth guarantee the U.S. its Number One position?* Certainly not! Swiss watchmakers, Japanese car manufacturers, and Russian missile engineers

James W. Skillen received his AB from Wheaton College, BD from Westminster Theological Seminary, and PhD in political science from Duke University. He has served on the faculty of Dordt College (1978-1982), Gordon College (1975-1978), and Messiah College (1973-1975), and is currently Executive Director of the Association for Public Justice in Washington, D.C. He is the author of International Politics and the Demand for Global Justice *(1981) and* Christians Organizing for Political Service *(1980), and is the editor of* Confessing Christ and Doing Politics *(1982).*

might find ways to advance beyond U.S. capabilities regardless of how much money or effort the U.S. puts into technology. Technology is not something that one country can monopolize even if it wants to do so. Moreover, an unlimited faith and excessive investment in big technology can sap energy from other kinds of human activities that are essential if people and states are to be strong. Even within the military we can ask whether today the U.S. has a well-balanced capability on all sides and in all dimensions, or whether it has become unbalanced in the direction of big weapons systems. But beyond the military there are important questions to be asked about the balance of our entire society and the balance of global political, economic, and social systems. Hitler's Germany was technologically advanced, but we hardly admire the character of that regime. What kinds of human goals are we encouraging in the U.S. with so much emphasis placed on a particular kind of technological growth? Do we really want to be Number One in missiles, but only Number Six in health care, or Number Ten in having a trustworthy government, or Number Twenty in urban safety? Is that real security?

4. *Should we accept Third World poverty and instability as an inevitable fact that perhaps even highlights American wealth and power?* Or could it be that real strength even for the U.S. lies in a more just world order where other countries become more self-sufficient, more productive, and more mature participants in defining the global context in which all states function? Robert S. McNamara warned that "We cannot build a secure world upon a foundation of human misery." Nurturing social justice is essential and realistic, not a useless ideal.[10] I am not suggesting that somehow the U.S. could unilaterally create a just world order if only it were not aiming to remain Number One in power and status. I am simply asking whether the latter aim does not keep us from making the kind of major effort toward the former goal, with the consequence that we end up saying one thing and doing quite another.

5. *Will the continuing quest to guarantee U.S. economic interests around the world keep the U.S. Number One?* If we insist on threatening to invade the Middle East to get the oil we need to fuel our economy, will we thereby build up healthy and secure interdependencies with other states? Once again, the answer is No! There is something pitiful about a person or a state that cannot live within its means, that cannot adjust to a reasonable amount of income and resources, that must resort to theft and violence and intimidation to take over or to hold onto what is not really within its own domain. If at this moment the U.S. were putting as much effort into energy conservation and the development of renewable resources as it is into preparations for strategic and conventional war to secure its hold on Middle East oil, both we and the rest of the world would be safer and more secure. Moreover, inflation, unemployment, recession, and balance of trade deficits in the U.S. are closely bound up with the world economy. These are global problems. International cooperation is required at the start not simply at the end of the line. But cooperation requires that states seek their common interests together in a just manner. Other states are not going to accept the U.S. goal of remaining Number One as a legitimate, common goal anymore than the U.S. would be willing to orient all of its policies to keeping some other state Number One.

6. *Is hardnosed pragmatism the one sure method for guaranteeing America's privileged place in the world?* No, the problem with pragmatism is that it leaves unexamined the underlying assumptions that structure its problem-solving approach. Pragmatism can try to solve problems only within the framework of assumptions that has already been accepted. But this means that any faith in pragmatism is a faith in yesterday's assumptions; it means putting our future in the hands of yesterday's visionaries. Has it not become clear, however, that the U.S. needs some new understanding, some new purposes, some new goals in a world that bears no resemblance to pre-industrialized Europe, a world which is even different from pre-energy crisis North America? A Number One America in 1950 will not necessarily be Number One in 1990 even if it refuses to accept that possibility. The question that the U.S. must ask, but which the pragmatists cannot answer, is "What *ought* to guide U.S. policy making now?"

If we can reorient our planning away from trying to remain Number One and toward building just relationships among states whatever our status, then we will be able to recognize false and unethical ideals for what they are.

The goal of "America First" or of "Keeping the U.S. Number One" cannot function as a meaningful goal of defense or foreign policy. It is a false god, a wooden idol, a romantic wish for happiness and security that functions as a substitute for genuine political norms and purposes. It is an *ideal* that does not help decision-makers give a proper response to reality. If U.S. interests are served, if the U.S. remains a strong country in the world, that will come as a by-product of the countless decisions that many states make with and without U.S. concurrence. In the coming decade America's role in the world depends on the degree to which it can help to build a more just and commonly acceptable world order. U.S. strength will rise or fall as a consequence of the many goals that it and other states seek in concert or at odds with one another. Its strength depends upon the norms that it obeys and upon the justice or injustice that it promotes. Being Number One is not a status that a state can obtain or maintain on its own by its own

acts of political and military will.

If we can reorient our planning away from trying to remain Number One and toward building just relationships among states whatever our status, then we will be able to recognize false and unethical ideals for what they are. We will then become free to try to live within our means, free to quit thinking about trying to invade some foreign territory to secure more energy than is our due. We will work harder at subjecting ourselves as well as others to a global structure of arms limitations and non-proliferation. We will then be able to gain considerably more help from other states in putting the right kind of pressure on the Soviet Union to reduce its similarly misguided quest for an impossible security based on sheer military power. We will become more secure as a country of justice contributing to justice for all.

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An Extended Book Review Essay

THE POST-DARWINIAN CONTROVERSIES

RICHARD P. AULIE

6806 S. Jeffery Blvd., Apt. 2G
Chicago, Illinois 60649

Based on The Post-Darwinian Controversies: A Study of the Protestant Struggle to Come to Terms with Darwin in Great Britain and America, 1870-1900 *by James R. Moore. London, New York and Melbourne: Cambridge University Press, 1979. This is part two of a four-part essay.*

Three Responses to Darwin

I. Christian Anti-Darwinism

In Chapter 9 we have a selection of eight anti-Darwinians all conservative or evangelical, who shrank back from any brand of evolution. This group is composed of a geologist, lawyer, physician, and five clerics, including the most learned in the lot, the theologian Charles Hodge of Princeton University. I fancy that those Christians who still have trouble with Darwin might be inclined to reach for this chapter first, and to give it the closest scrutiny. They may rest assured that the treatment is entirely fair and sympathetic.

These writers did not worry so much about specific ideas of Darwinian evolution, such as natural selection, as they did about the scientific method that Darwinism represented. For instance, the English cleric Thomas R. Birks, a founder of the Evangelical Alliance, in 1846, thought that evolution, by overlooking plain facts in the Bible, violated the scientific laws of induction and deduction (p. 201). They all reaffirmed two well-established ideas that Darwin rejected, that true science provides certainty, and that species were fixed. Burr, in Connecticut, wrote that theism offered the "simplest" and "surest" view of nature (p. 198), and that species were "as far apart today as they were at the dawn of history" (p. 210). Hodge, the persuasive spokesman for conservative theology, was perhaps the most prestigious and influential of the American Christian anti-Darwinians, and he also found a receptive audience in England through the Evangelical Alliance (p. 7). For him, the answer to the question posed by the title of his book in 1847, *What is Darwinism?*, was, of course, atheism (p. 204). Yet he developed a sound analysis of Darwinian evolution, and what he considered to be its implications for Christian theology; he was no obscurantist. Similarly, Luther T. Townsend, Methodist minister and later professor of biblical languages at Boston Theological Seminary, observed in his major book, *Evolution or Creation,* that Darwinian evolution was "not supported as a whole or in any of its parts by a single well-established fact in the whole domain of science and philosophy" (p. 199 in Moore).

For Hodge and the others, the chief failure of Darwin was in his scientific method. Arriving at truth in science and theology alike rested, for Hodge, on Baconian principles of inductive reasoning, which led from particular facts to general statements of certainty. This, Darwin had ignored, they all seemed to say. Whether the facts of Scripture or the facts of nature, Hodge insisted, their proper arrangement provides a sure knowledge of God. The Baconian method therefore denied Darwinism and supported Christian theism, and made plain that Darwinism was atheism.

A Note on Francis Bacon

Somehow the shade of the old Lord Chancellor seems to hover over these nineteenth century deliberations on evolution, and in Moore's book Bacon earns fourteen entries in the copious index as a mark of his importance. Born into a Calvinist-Anglican home, Bacon devoted his life to setting the "new philosophy," meaning modern science, on the right track. Elucidating the proper methods of studying God's book of Nature and expanding on the benefits that inevitably would accrue—such was his great project, his

great idea, his life-long ambition. He wrote his books, dashed down with anguished zeal in a hectic life, at about the time the Authorised Version of the Bible was being developed. In a sense the two achievements were parallel, and Bacon's work certainly drew strength from the Bible. His fervent prayer was that God's blessing would be poured out on mankind through the "new philosophy." But the chief obstacle to this blessing, he said, was a tragic reliance on Plato and Aristotle, whom he denounced as deceivers and purveyers of falsehood. Study Nature herself, he cried, not those ancients! Only then would life be enriched through industry, arts, and crafts—"for the relief of man's estate," was the phrase he used. He wrote his *Novum Organum* (1620), or new logic, to be a substitute for the old *Organon* of Aristotle. What did Bacon have to do with evolution? His philosophy symbolized the new streams of thought that led to Darwin.

King James I said that Bacon's philosophy was "like the peace of God, which passes understanding"—borrowing words fresh from his translators. The so-called inductive-deductive method was not the sum of Bacon's lifework, of course, and in the event science did not develop according to his vision. Still, for more than two centuries toiling editors had offered him up to bookish sorts as the prophet of the new science, his thoughts appearing again and again in the writings of those who sought to decipher nature. No one paid any attention therefore when the Christian poet and painter William Blake warned that "Bacon's philosophy has ruin'd England."

The Christian anti-Darwinians, like many other Protestants who studied Darwin, seemed to know their *Novum Organum,* and perhaps Hodge had access to the fifteen volumes of Bacon that come out from 1857 to 1874. With regard to inductive reasoning, Darwin once tried to pass himself off as a true Baconian (p. 154 in Moore). But in his *Origin of Species,* after quoting Bacon on the flyleaf, he went well beyond Baconian ideas. He offered up a quite different scientific method—testing hypotheses from which broad principles are deduced. By so doing he strove to account for the adaptations of living organisms to their environment, that is, for the biological variations, which he said were unlimited. True science, said Darwin, can verify hypotheses and theories only to a high degree of probability. But given the prestige of Bacon, the popularity of his books, the forceful elegance of his prose, and the appeal of his Christian zeal, Bacon could easily have inspired any philosophic quest for certainty. We must therefore reckon with Bacon if we are to understand why the Christian Anti-Darwinians rejected evolution and yearned after certainty in both science and theology.

For the Christian anti-Darwinians, certainty in science was possible and necessary because the world possessed a definite number of species, which had remained fixed since the time of their special creation. Moore traces the origin of this idea of species fixity to pre-Christian antiquity, when Plato and Aristotle described the order and stability of nature in terms of unchanging ideas and forms or essences. This pre-Christian theme was codified in seventeenth and eighteenth century natural history as the doctrine of special creation, which remained substantially unchallenged until the time of Darwin. Accordingly, biological species and anatomical homologies were interpreted as representations of a "plan" or "type" that existed from eternity in the mind of the Creator. In the eighteenth and early nineteenth centuries, this Platonic-Aristotelian theme in fact was the primary interpretation of biology on the continent, in England, and in later years in America, and indeed until the time of Darwin it was a powerful tool in the development of animal and plant morphology and taxonomy. Thus, when the Christian anti-Darwinians faced the challenge to their faith posed by Darwin, they were able to invoke the scholarship of the day in order to substantiate their exegesis of the creation account in the Bible. Moore points out that the chief authority for the Christian anti-Darwinians was the great Harvard University naturalist (in 1847-73), Louis Agassiz, of Swiss-Protestant extraction, who was the most powerful exponent in science of special creation at that time (p. 207-211).

On Louis Agassiz and Asa Gray

As a zoologist, teacher, geologist, the founder of the theory of glaciers, and public advocate of science, Agassiz became known far and wide in the land of his adoption. He was a charismatic figure and one of the most complex and interesting personalities of nineteenth century America. Everywhere he went in his energetic, nationwide promotion

Richard P. Aulie holds the doctorate in the history of science from Yale University, the B.S. from Wheaton College and the M.S. from the University of Minnesota. Formerly a high school biology teacher, he has published frequently in the professional journals on the history of science, including articles on the non-biblical and pre-Christian origins of the doctrine of special creation. Continuing his interest in the eighteenth and nineteenth centuries, he is now writing a book on the scientific results of the voyages of Captain James Cook. He is cited in Who's Who in the Midwest.

of scientific culture and institutions, this versatile *émigré* had the knack of gathering up admirers, friends among the mighty, and ready cash for his various projects. The founding of the National Academy of Sciences in Washington, D. C., and of the Field Museum of Natural History in Chicago are examples of his encouraging hand. As to religion, he seems to have left in Switzerland his heritage of Swiss-Protestant reformers; whenever he was in Boston he took part in a comfortable Unitarian fellowship. Agassiz and Gray, who was the famous botanist, were colleagues at Harvard. While Agassiz was the much sought after public figure, Gray, with no fawning disciples, devoted his energies for the most part to his plants and classes, and attended an orthodox Calvinist church.

Agassiz and Gray had a high regard for each other's scholarship, of course, but on matters Darwinian, a great gulf became fixed between them. They inhabited different worlds in their basic interpretation of nature. They could hardly even use the same language in discussing the subject of species. Agassiz's students were digesting enticing new ideas in biology, and inevitably they found it irksome to classify his frogs and crayfish according to special creation. Agassiz represented the apex of an age, while Gray represented the future. They became a trial to each other, and inevitably public clashes erupted between them. The cup would not pass from either.

The Christian anti-Darwinians could not have settled on an abler and more influential authority than Louis Agassiz, whose published scholarship was massive and much admired, and, on the subject of special creation, unmatched to our day. He believed that nature was created by God, and he echoed Plato in writing that all animals, both living and extinct, exhibited a "plan" that "has been preconceived, has been laid out in the course of time, and executed with the definite object of introducing man upon the earth" (p. 208, from Agassiz). With his well-known erudition as a springboard, he launched his own campaign to enlighten the public. For him this meant arguing the case for special creation, which he did on the lecture platform and in magazine articles. Naturally, many clergymen and laymen were grateful for the assurance from so learned a scientist that Darwin was mistaken. As a popularizer of science according to his own lights, Agassiz went forth from strength to strength.

Moore, documenting Agassiz's influence, reports, for instance, that the British physician Charles R. Bree wrote of the "immortal" Agassiz who had explained structural similarities as "the expression of the thoughts of the Deity" (p. 210); Curtis said Agassiz was "the most exact and logical reasoner" who had described the "ideal plan" that united man with the other vertebrates; and Hodge declared, "Religious men believe with Agassiz that facts are sacred" (p. 210-212).

Here, the arguments adduced to support objections to evolution were basically philosophical, rather than biblical and theological. Just as we must reckon with Bacon to understand the emphasis on certainty among the Christian Anti-Darwinians, so Agassiz is the key to understanding why they preferred special creation and fixity to Darwin's theory of evolution.

Moore's identification of Bacon and Agassiz in the writings of the Christian anti-Darwinians raises an interesting question, one that I think is also reasonably important to keep in mind as we negotiate our way among the turbulent ideas of the nineteenth century. He has pointed out the derivation of Agassiz's conception of species from Platonic thought, and I have pointed out that Bacon strenuously argued for a breach with this tradition. The Christian anti-Darwinians might well have recognized the influence of Plato in Agassiz and, given the prestige of Bacon at the time, one would expect that they would have been chary of taking the views of Plato, if they knew what Bacon said about the ancients. He called Plato a wily detractor, a swelling poet, his philosophy scraps of second-hand information. And he likened poor Aristotle to anti-Christ. Why? Because they were an obstacle to progress, nothing of practical value ever came from their philosophies, which were nothing but disputatious head knowledge, anyway. Science, he kept on insisting, could make headway only by rejecting the ancients and going directly to nature. It seems to me that Hodge especially, good Baconian that he was, might have been wary of Platonism in special creationism. While Bacon's Christian vision of nature would have been attractive to the Christian anti-Darwinians, they could easily have noticed his repudiation of Platonism—which they perforce accepted when they embraced the views of Agassiz. This fusion of Bacon with Plato by those who esteemed both logic and fidelity to the Bible is indeed strange.

Neither certainty nor fixity, according to Moore, was derived from the Bible. In fact, "the quest for certainty was a chimerical undertaking" (p. 214) because it carried the erroneous implication that Providence could be predicted. I should think that Hodge would have been troubled by this contradiction, inasmuch as the Bible asserts that God's ways are past finding out. "But this implication had already been codified in the doctrine of the fixity of biological species," a conception of nature that was pre-Christian in origin. A non-Christian world-view had crept in unawares. Moore writes (p. 215-216):

> Ideal types, creative plans, and a progressive plan of creation that culminates in a being whose thoughts on the matter are supposed to be like unto God's—none of this was less presumptuously anthropocentric, none less discordant with doctrines otherwise professed, than the theological implications of a quest for ultimate certainty in inductive inferences. The anti-Darwinian element in Christian Anti-Darwinism may thus in fact have had little to do with Christian doctrines. Perhaps, after all, what conflicted with Darwinism were the philosophic assumptions with which the Christian faith had been allied.
>
> Faith has never been able to seal itself off from philosophy and few believe it should. But if faith's philosophy goes unacknowledged or if faith thinks it has no philosophy whatever, then, insensibly and inevitably, a prevailing world-view seeps in, colouring whatever pretends to be a pure apprehension of Christian truth. Doing philosophy thus by default is a risky business and anti-Darwinians illustrate the result. In the name of Christian and biblical teaching they set the static world of antiquity over against a theory that helped to resolve the enigmas of natural history which the old world had merely enshrined. The fixity and certainty banished from the heavens by Christian philosophers, from Galileo and Newton to contemporary interpreters of the nebular hypothesis, they domesticated

on the earth, where Darwin found naught but process and probability. Thus, while Darwin won the best minds of the next generation, the faith that had attached itself to the old philosophy and the old science was quietly abandoned.

II. Christian Darwinisticism

The lack of agreement in science concerning the merits of Darwinian evolution during the closing decades of the nineteenth century parallels the diversity of opinion among the Protestant writers analyzed in this book. In fact, one can easily get the impression that all these Protestants had nothing better to do than to sit around, wantonly spinning out opinions in a "superfluity of naughtiness" about evolution. But they were dealing with a theory that was just beginning to make its way. Reasons obtained for the efflorescence. Geology had not yet given Darwin the time he needed, and quite likely he never heard of Gregor Mendel, who would propose the laws of heredity, which would explain the appearance of his variations. Scientists had different opinions. So did these churchmen Moore has assembled under the rubric "Christian Darwinisticism": six British writers and eight Americans, composed of pulpiteers, with two geologists, a naturalist, and a philosopher (Chapter 10). These Christian clergymen and laymen all accepted evolution, and they sought to reconcile what they perceived to be Darwinian evolution with their own conception of Christian doctrine. But in doing so they came up with ideas of evolution that were not Darwinian in origin or in content.

While the Christian anti-Darwinians were primarily philosophical in their objections to Darwin, these writers were rather more theological in the resolution of their crisis of faith. They differed from the Christian Anti-Darwinians in two ways: they fully accepted Darwinian probability in science, and so here at least they were in tune with modern science, and they had no qualms about viewing nature as manifesting process, progressive change, and development. In other words, they believed that God brought about His purposes in nature, including the noblest of all creations, man, by the process of evolution. So far so good.

For these writers, the *Origin of Species* raised challenges to basic doctrines of Christian faith. Undoubtedly Darwin had found much that was true, they were ready to admit, but he talked about ideas that were difficult for any Christian to accept. For one thing, natural selection appeared to be a substitute for design. For another, Darwin seemed to imply that man was not uniquely created in the image of God. Moreover, the problem of evil was involved. Here was Darwin declaring that only the fittest survived in the struggle for existence. He was really casting aspersions on the benevolence of God when he described nature, not in accord with the will of God, Who "saw that it was good," but as an arena of death and suffering among cruel animals locked in mortal combat. These writers were certainly perceptive; they were facing up to difficulties that may still plague the mind of a thoughtful Christian who seeks a rapprochement between personal faith and modern biology. What to do? Perhaps evolution was not precisely Darwinian. In Moore's view, "they adopted theories of evolution, which, by altering and adulterating Darwinism, were congenial to the purposes and character of God" as they understood those divine qualities (p. 220).

These energetic "Darwinists," meaning in this case those who modified Darwin's ideas, took three liberties with Darwinian evolution in order to save their faith. The following is my exegesis of Moore's point of view.

First, seeking to preserve God's purposes in nature, they reduced the influence of natural selection, and added one sort or another of a "divine agency" that acted like an inner, directing force (p. 220-230). The Anglican cleric Frederick Temple wrote that the Lord had provided matter with "such inherent powers that in the ordinary course of time living creatures such as the present were evolved" (p. 220); for Henslow this force was "directivity" (p. 221); for University of Wisconsin philosopher John Bascom it was a "spiritual agency" (p. 223); and the popular pulpiteer in Brooklyn, Henry Ward Beecher, expanded similarly on a "tendency" impressed on nature (p. 221). Beecher's successor was Lyman Abbott, who abandoned Darwin's struggle for existence to proclaim that "Evolution is not to be identified with Darwinism" (p. 226). The trouble with natural selection, announced Francis H. Johnson at Andover Theological Seminary in Massachusetts, was that it lacked "a supreme constantly working creative intelligence" (p. 227). Likely some of them did not understand natural selection to start with, but then, neither did many scientists during those years.

Second, in order to preserve the doctrine that man reflected God's own image, they introduced variations of special creationism (p. 231-236). For instance, Temple tinkered with the old idea of the "unity of plan" among vertebrates so that environmental changes would bring forth man at the proper moment (p. 232). Henslow called down "some special interference of the Deity" to introduce man's moral and religious qualities, while Bascom allowed that "the rational element is superinduced on the vital element as wholly above and beyond it" (p. 233, 234).

And *third,* partly to explain the problem of pain, and partly to guarantee the omnipotence of Providence, these writers saw evolution as a progressive process embracing the entire cosmos (p. 236-241). Darwinian evolution, however, was limited only to the biological realm, and certainly did not secure the inevitability of progress. They shared an allegiance to the grandest of all schemes of evolution, Herbert Spencer's; their interpretation carried an undercoating of Lamarckian ideology and their own view of divine immanence. Beecher basked in a creation that was "moving onward and upward" (p. 220-221), and rejoiced that the human race was steadily ascending by the process of evolution. Drummond thought Spencer's altruistic mode of evolution, by the inheritance of acquired characters, was far superior to Darwin's struggle for existence (p. 237). George Matheson, Church of Scotland preacher, found that Spencer's system agreed nicely with the Apostles' Creed, and that even the inconvenience of death resulting from the struggle for existence was banished by evolution (p. 237, 239). Clearly, the world was moving to better

things, in which, for Minot J. Savage, possibly the first American preacher to come out publicly for evolution, evil was only a "temporary maladjustment," and for Temple, a medley of "imperfections" (p. 239, 240). These writers celebrated the inevitability of progress and the perfectability of man. The very Kingdom of Heaven was the goal of all evolution. They certainly were capable of an exuberant style as they reconciled evolution with Christian thought. But many of them lacked the rigor of expression found among the Christian anti-Darwinians.

These Christian Darwinists, who had adulterated Darwinian evolution, were far from the theology of the Christian anti-Darwinists, who rejected evolution. Anyone who knows the difference between liberalism and conservatism in Christian thought can easily discern the difference in the above three paragraphs. What Moore finds in Christian Darwinisticism is that its proponents, in the main, were liberal in theology (p. 304-307). He reports, for instance, that Bascom rejected Calvinism, so did Savage who became a Unitarian, Abbott was "America's leading representative of evangelical liberalism," and Le Conte wrote that he was "first orthodox of the orthodox; later, as thought germinated and grew apace, I adopted a liberal interpretation of orthodoxy; then, gradually I became unorthodox; then, in deep sympathy with the most liberal movement of Christian thought; and finally, to some extent, a leader of that movement," which was Unitarianism (p. 304).

Analysis

The question that Moore seems to be asking is this: What was it about liberalism that prevented the Christian Darwinists from accepting Darwin's theory of evolution, and prompted them instead to accept a version of evolution derived from the thought of Lamarck and Spencer? He holds that it is insufficient to say that their views simply reflected the scepticism of science at that time for Darwin's theory. His answer is two-fold (p. 340-345, *passim*), and here again is my analysis of his interpretation.

First, their doctrine of creation was not that of either the early church fathers or of the Renaissance founders of modern science. Perhaps unconsciously, these Christian Darwinists attributed qualities to nature that were categorically rejected by Christian philosophy and by science. According to this rejected view, which was derived from Greek thought, nature was self-dependent, divine-like, and its purposive activity could be accounted for by some sort of inherent, non-material or incorporeal agency. Christian theism and modern science cast aside this view. Thus, the terms "inherent powers," "directivity," and "spiritual agency," used by these Christian Darwinists, reflected a blurring of the distinction made by Christian theism between God and nature, and the attribution to nature of this conscious-like, non-material agency. Moore's view here is ingenious, perceptive, open to amplification, and, I think, correct.

On the Uses of Language

Because this line of reasoning is a bit tricky, perhaps I can amplify with a note on the uses of language that may help to clarify the matter. Biologists since ancient times have sought to explain the apparent purposive behavior of living things. For instance, why does an egg become a chicken? The ancients sought explanations with various *non-material agencies* residing within nature. Aristotle said that every object, both non-living and living, such as an egg, has an "active potency," which makes that object realize whatever it is supposed to become, such as a chicken. Galen used the Aristotelian *pneuma,* and here our language at once fails us, for the word is usually translated as "spirit" or "breath of life," but the word does not mean quite either one. The Arabs of the Middle Ages had three kinds of this "spirit," which William Harvey in 1628 used to explain why the blood circulates. Later, other words turn up, such as *vis essentialis, nisus formativus,* "entelechy" and *élan vital,* which are also imaginative in their way. To the person who is familiar with the literature, such terms are "code words" that signal the presence of a teleological view of nature that was rejected by Christian theism and by emerging science. According to this view, nature had conscious-like, occult qualities that were divine-like and directive in their actions. (This is the *natura naturans* of Renaissance philosophy.) Some of these words did survive until the rise of chemistry and genetics, and now we know that various physiological functions are described by the actions of *material agents,* such as enzymes, genes, hormones, minerals, and vitamins.

In the nineteenth century, these Christian Darwinists, not liking or understanding natural selection, fell back on the old terminology, such as Henslow's "directivity," to explain how evolution works. Somehow their non-material agency was created inside a living thing, or else it was a pantheistic, divine emanation, such as Bascom's "rational element" that was "superinduced" (p. 221, 234). I have no doubt that they thought they were giving a reliable explanation. But their terms, however pious and religious the intent, really do not explain observed reality, and for that reason are not scientific; they are only words, only a *flatus vocis.* The Christian Darwinists would have been on unassailable ground theologically if they had said only that "God did it." Francis Johnson's "creative intelligence" was a "new and totally unknown principle," he claimed, and he was exactly right when he said without apology that his principle was undiscoverable by science (p. 227). The Christian Darwinists, having moved away from the Judaeo-Christian doctrine of *creatio ex nihilo,* had to settle on some sort of explanation, and the only one at hand was derived from Greek thought.

I come now to the *second* part of Moore's answer to the question of why liberalism could not accept Darwinian evolution. This part involves the tension between the concepts of transcendance and immanence. Some of the Christian Darwinists diluted the doctrine of the Trinity with a form of deism now called "semi-deism." Moore holds that Christian Darwinisticism derived much from a tradition of non-Darwinian evolution which emphasized the laws or principles that God had introduced into nature at the beginning of the world, to the neglect of His continuing providence. For instance, Lamarck was a deist, and his theory

of evolution operated by an innate power that guided life toward perfection.

A Note on Deism

Deism was the view of those who relegated the role of God to the creation of the world according to rational laws and principles. According to this rather stark view, God then virtually withdrew from His creation, allowing the world to operate by those laws that He ordained and that man can discover. The clock, having been made by the divine Clockmaker, runs by itself. The heyday of deism was in the eighteenth century. Some say that Isaac Newton eventually leaned toward deism. The celestial bodies "must be all subject to the dominion of One," he said. "This being governs all things, not as the soul of the world, but as Lord over all" (*Principia*, General Scholium, 1729). He also claimed, however, that the world, having been formed by the "Laws of Nature," would "continue by those Laws for many Ages"—a view that certainly savors of deism. And when he could not account for various planetary perturbations, he did seem to think that the Deity might have to intervene now and again to make adjustments, "or a Reformation," in the mechanism—deism again (*Optics*, 31st query, 1730; Dover, p. 402).

But in 1784-86 the French mathematical astronomer Pierre Laplace found that Newton's perturbations were self-correcting, and that the solar system was in no danger of getting itself out of kilter. Laplace's book in 1799 on celestial mechanics occasioned a storied encounter with Napoleon that has a bearing on deism. Napoleon, trying his best to be aggravating, asked how it was he could write such a huge book on how the universe works without once mentioning the Author of the universe. Laplace snapped, "Sire, I had no need of that *hypothesis*" (Bell, E.T., 1937, 1965, *Men of Mathematics*, p. 181), a saucy retort that is sometimes hailed as another example of French *snobisme*. Of course, Laplace was right, as the French usually are. Deism certainly was the predominant conviction among the American founding fathers, including our first three presidents, notwithstanding the hymns we sing about the faith of our fathers.

"Semi-deism," the term used in recent years by Reijer Hooykaas, historian of science at the University of Utrecht, sprang up among various Christian naturalists in England during the decades before Darwin.Their writings either advanced or implied this view. While still emphasizing God's role at the creation of the world, they held that certain events in the natural history of the Earth, such as geological catastrophes, and the progressive appearance of animal life on an ascending scale of perfection, resulted from repeated divine interventions in nature. They therefore pled God's miraculous exertions in assorted ancient upheavals and in the special, intermittent, and sudden creation of species. The key idea here that distinguishes semi-deism is the repeated intervention of God. In other words, these Christian naturalists held that God was most active at the beginning of the world, but then He acted again from time to time, as though He were first absent, then present. But in thus opposing uniformitarianism, they examined the problem of Earth history in much the same way as did the deists. To this extent, says Hooykaas (1963, p. 192-206), they were "semi-deists" (p. 328-329 in Moore).

The Christian Darwinists likely would have been offended by any suggestion that their views were tainted by deism or by any of its variations. But Moore's point is that their interpretation of evolution reflected the patterns of thought still current at that time, and this meant the influence of deism. After all, if nature is governed, even in part, by self-operating laws, it is to that extent not dependent on God's sustaining will. Beecher, for instance, wrote of "the mediation of natural laws" that drove creation "onward and upward" (p. 221). According to this view, which is really a semi-deistic doctrine of *creatio ex nihilo*, God's presence was focused at the beginning, when He inserted those various laws or principles into nature. Because such laws or principles were, in a manner of speaking, self-directing, they did not require that God should be continually on the spot in a supervisory role for the fulfillment of His purposes, although, to be sure, He did have to intervene on occasion in a special way, such as for the creation of man. If God acts specially at intervals, then it follows that He is less active at other times—and such a view is an echo of deism.

A question at once arises. Are we not really stating a valid Christian view of evolution when we say that nature develops progressively by natural laws that God established at the beginning? If I am not much mistaken, I think Moore's book would have us take another look at such a view, for it neglects the divine immanence in the creation. Deism is not Christian theism. Bacon would say again that Moore has given us more food for thought. At any rate, the Darwinian version of evolution could never be accepted by the liberals, who had moved away from the traditional doctrine of the Trinity. "I am an evolutionist," cried Beecher, "and that strikes at the root of all medieval and orthodox modern theology," he explained (p. 305).

Moore writes (p. 250-251):

> God was of course the key that unlocked the mysteries of evolution for all the Christian Darwinists. But the God in whom one believed had everything to do with the kind of evolution whose mysteries had been unlocked. Those who could only discern God's purposes in nature if they were ascribed primarily to causes other than natural selection seemed bound to interpret evolution as the expression of a universal progressive providence through which the divine character could also be vindicated. Human evolution for them did not constitute an insuperable difficulty if the divine immanence were rightly construed. . We find the majority of Christian Darwinists transforming Darwinism with theories of Lamarckian evolution which embodied doctrines of providence and progress characteristics of post-Kantian liberal theology.

(to be continued)

Pascal, Passionate Pilgrim

Thomas Stearns Eliot, poet and critic, remarked, "Pascal is one of those writers who must be studied anew by each generation." Blaise Pascal, physicist and layman, was an intellectual pilgrim passionately concerned with the relation of religion and science in his search for truth.

His father Étienne, a Paris-trained lawyer, lived in the cathedral town of Clermont (now Clermont-Ferrand) in the historical French region of Auvergne with its mountains of volcanic origin. A devotee of ancient languages and mathematics he personally undertook the whole education of the motherless Blaise, who turned out to be a child prodigy.

In later life Blaise analyzed the world in three orders: bodies (matter), reason (mind), spirit (heart)—i.e., the unconscious, conscious, and self-conscious. We review his own life in terms of these three orders—called his greatest insight by the Quaker philosopher Elton Trueblood. To be sure, Pascal regarded the orders in ascending importance as distinctly separated, whereas we today would consider them as interrelated.

With respect to the world of bodies, Pascal's father had taught him to observe carefully, to keep in mind that words are poor representatives of things, and to reason step by step. It was not until he was 23 years old that Pascal used this method as a means to discover scientific truth. In Rouen, where there was an excellent glass works, he repeated Torricelli's barometric experiment to solve Galileo's problem of the failure of a pump to lift water higher than 34 feet. Employing glass tubes 46 feet high, he varied their size and shape, as well as the liquid; he confirmed Torricelli's hypothesis about the existence of a vacuum on top of the liquid. Moreover, he had his brother-in-law Périer take a barometer to the top of Pûy de Dome (4000 feet) and he himself took one up the Tour de St. Jacques de Boucherie in Paris; in each case the mercury rose to a lower height. He suggested its use as an altimeter. His published paper is an excellent report utilizing the scientific method based upon accurate observations. Upon his death two unpublished monographs were found involving a new concept, pressure, and its application in Pascal's Law for the transmission of pressure in a confined liquid. Pascal had followed his father's teaching, beginning with observed facts and ending with experiment tempered with imagination (intuition)—what he called *esprit de finesse* in contrast with *esprit de géometrie* (based upon reason per se). Apparently he had abandoned science owing to the vanity of the world of bodies.

His attitude to the world of reason is expressed in his mathematical genius and in his theological concerns. At the age of 16 he wrote a one-page paper on the "mystic hexagram" along the lines of the projective geometry initiated earlier by Gérard Desargues—not appreciated until its revival in 1822 by Jean Poncelet; it deals with relations only, no magnitudes. An unpublished paper on invariants of conics was found among Pascal's papers upon his death. His only other known geometrical work was on the cycloid, which he did during a toothache in 1658—under the anagram Amos Dettonville. At 19, to facilitate his father's tax accounts, he invented the first calculating machine; but despite three years spent upon improving it, he found no market for his 50 products (10 are extant, one in the Conservatoire des Arts et Métiers). Toward the end of his life he became involved in one other enterprise, a proposal for a bus (*omnibus,* for all) in lieu of the carriages for only a few. Three months prior to his death a bus ran every 7½ minutes on a Paris street.

Pascal's friend Chevalier de Méré asked him how the stakes for a wager should be divided if a game was not completed. This question stimulated his interest in mathematical probability; together with his friend the lawyer Pierre Fermat he explored this new world. The historically minded mathematician Eric Temple Bell characterizes Pascal, who abandoned science and mathematics for his religious concerns, as "the greatest might have been in history;" nevertheless, he includes him in *Men of Mathematics.*

Pascal's theological interests were aroused in 1646 by two bonesetters in Rouen, who were required for an accident to his father. They introduced him to a Protestant-oriented Catholic sect known as Jansenism; it was based upon a strict interpretation of the Bible and upon rigorous practice of its preaching. This so-called "first conversion" of Pascal was essentially intellectual.

Following his father's death Pascal had a strange interlude characterized by his procurement of women servants, a carriage, et al. He became fascinated by the theater and gambling. After a couple of years, however, he developed a scorn for these worldly activities and resorted to reading the Bible (he knew much of it by heart), the Stoic Epictetus, and the sceptic Montaigne. He concluded that the study of man was more important than the study of science.

His experience of the world of the spirit began with a mystical illumination which he had late on the night of Nov. 23, 1654 after agonizing over the plight of man. This "second conversion" was truly of the heart. He wrote a memorial of his certitutude encountered in a vision of fire (cf. the burning bush of Moses); the Word of God is the Living Word revealed in the mystic grace of Jesus Christ—heart felt rather than mind-full. He rejoiced with tears and renunciated his past. He became an ascetic, wearing a concealed iron belt with points. (Upon his death a parchment recounting his experience was found sewed under the lining of his doublet.) Pascal went to live with the solitaires of the Jansenist Port-Royal-des-Champs, where he was known as M. de Mont.

In 1656 he was requested to defend Jansenism against attacks of the Jesuits. His scheme was to write letters telling the actual facts to a provincial friend—*Les lettres provinciales* by M. Louis de Montalte. With great humor his first letter tells of an interview with an anti-Jansenist about the controversial doctrine of grace. In the second he interviews a Dominican (Thomist). The next seven letters deal directly with the Jesuits through various interviews. Letters 10-16 analyze crittically the Jesuit ethics, particularly casuistry. The last two defend Jansenism in view of it's condemnation by Pope Alexander VII. He was encourage by the miraculous healing of a supposedly incurable lacrima fistula in the corner of the left eye of his niece Marguerite when she touched a Holy Thorn from a relic said to be Jesus' crown of thorns. Pascal had a new

seal made with the inscription, "*Scio cui credidi*" (I know whom I have believed - II Tim. 1:12).

In 1657 Pascal conceived the idea of an apology based upon reason to counter atheism; he had become convinced of the errors of Stoicism and Pyrrhonism. He started making notes on scraps of papers, backs of bills, etc.; to be sure, he had a prodigious memory, but it began to cloud shortly thereafter and his illness prevented the completion of this project. The executors of his will, his sister Gelberte and the Duc de Roannez, published these fragments as his *Pensées* in 1670 (their Jansenist editing omitted the *Mystère* (# 552)). Trueblood in his *A Place to Stand* (1963) cites it twelve times; he notes, "Ever since I first encountered Blaise Pascal, I have been intrigued by his ambitious purpose." No one ever reconstructed the apology according to Pascal's plan. Introspective like Dante's *Divine Comedy,* it represents Pascal's spiritual growth.

The *Pensées* begin with an explanation that religion is not contrary to reason. Pascal himself was opposed to scholasticism with its metaphysical proofs of God's existence. He was opposed to philosophy, particularly that of René Descartes, the so-called father of modern philosophy. For him religion had become primarily a matter of the heart, of grace-full faith, which transcends reason. "The heart has its reason which reason does not know" (# 277). His approach, however, is similar to his scientific method, i.e., facts leading to theory via induction—called the immanental method. There is, of course, no experimental check, so that one is advised to wager on God's existence; the odds favor the great reward if successful and little loss if not. Indecision is itself a decision.

The *Pensées* exhibit two major emphases—not to mention many pithy remarks such as the dependence of the history of the world upon the length of Cleopatra's nose. In the first place, he is concerned with man, "a thinking reed," torn between misery without God and grandeur with God, suspended between nothing and infinity (nowadays we are distraught by our ignorance of the very small and of the very large). Secondly, he is intrigued by man's search for the hidden God, attained only by God's quest for man through Jesus Christ. He sees in the Bible the evidence of its truth, i.e., the fulfillment of its prophecies and the testimony of its miracles. Émile Cailliet, professor of French literature and culture, Protestant convert from Roman Catholicism, emphasizes that "The Clue to Pascal" is the Scriptures.

The thoughful Pascal, however, cannot be regarded as a great thinker, but he reveals in his *Pensées* the emotional faith of a great Christian. He lived and died a Roman Catholic; he practised love (charity). He was wont to borrow funds to give alms ananymously; he turned his own home over to a family with smallpox. Toward the end of his protracted illness he was reluctant to have communion with its associated confession, which might distress his family with its suggestion of last rites. He did receive it on August 19, 1662, after which he died with the words, "May God not abandon me!" He was buried in his parish church, St. Étienne du Mont. The attending pastor, Père Beurrier, attested to the orthodoxy of this humble and sincere man, whose outstanding sin was his intellectual pride. Later he retracted his opinion so that Archbishop Péréfix insisted that this revision be inserted as a preface to the pending publication of the *Pensées.* (The priest later retracted his retraction.) The publisher, however, merely failed to publish the first edition, but began with a second edition—without the preface.

Pascal showed some interest in the teaching at the famous Little Schools of Port-Royal. He prepared a geometry book, which he scrapped when a better one by Arnauld appeared. He did, however, contribute to the teaching of reading by advocating sounding the vowels first, then using consonant prefixes. The Little Schools of Port-Royal were noted for their emphasis upon French and then Latin in lieu of the Jesuit stress upon Greek. The *Logic of Port-Royal* is still used.

Pascal's enduring fame is his writings. He is said to have "determined the shape and character of French literary language"—his influence upon its prose was similar to that of Corneille's *Le Cid* upon poetry. (The *Les lettres Provinciales* are required reading in French schools). His style was not heavy like the Latin prose of the schools (probably because of his home teaching). He wrote colloquially; he used everyday words. His phraseology was simple and lucid. He was objective and hence realistic, but also imaginative and therefore poetic. (The very abruptness of the fragments lends a poetic quality). He liked Hebraic parallism, particularly antithesis; he used prosopheia. His writings showed polite irony and broad humor—probably the sharpest wit prior to Molière. He carefully revised his work (the 18th letter was done 18 times). He noted (# 319); "The last thing one settles in writing a book is what to put first." His works attracted Voltaire and Condorcet, they influenced Renan and Mauriac.

In early life Pascal sought social fame and personal love, but his spirit gradually darkened upon becoming aware of the vanity of the world's rewards. He sank into despair, which became alleviated only by his realization of the saving grace of Jesus Christ." He hastened to warn others, but only aggravated his continual illness; he died at 39—comparatively young.

Raymond J. Seeger

National Science Foundation (retired)
Washington, D.C.

The third in a series of notes on religious scientists.

Descriptive and Ideal Psychological Theory

As Christians involved in scientific research, we must continually assess the relationship between our faith and our theoretical position. Of recent years, there has been much written on this relationship, particularly in the field of psychology.

One aspect of this relationship involves the question, "Why is psychological theory frequently in disagreement with Christian beliefs?" The personal responsibility for our actions seems to be compromised in the deterministic frameworks of Freud or Skinner. At the same time, the hope of Rogers and other humanistic writers seems unwarranted if the seriousness of sin is to be accounted for. The common response is to point out that the presuppositions of psychological theory and Christianity are at variance. We as Christians have a different world-view than the non-Christian and, therefore, our interpretations of human behavior differ. Paul's letter to the Romans describes a fallen world in which the mind of the non-believer does not give place to God. As a result, the created world is misinterpreted.

Through the influence of Kuhn (1970), Polanyi (1946, 1962), Toulmin (1962) and others, psychology has begun to recognize the place of presuppositions (Reese and Overton, 1970) and faith (Frank, 1977) in the formation of theory. As Christians we have tended to unsheath our Van Til or Schaeffer, critique the world-views proposed, and subsequently reject many theoretical proposals. At times, this has been an appropriate strategy. Such criti-

ques can avoid the dehumanization of mankind, reject a theory which has a limited view of reality, and point out inaccurate portrayals.

A second aspect of the relationship between our faith and our theories concerns the question, "Why do Christian beliefs and psychological theory often agree?" Why do we find the theories of Freud, Adler, Wolpe or Rogers so useful in counseling? Why is "self actualization" a helpful concept in understanding Christian maturity for some? The answer could be given that Christian and non-Christian both live in an objective world created by God. In addition, both Christian and non-Christian are created in the image of God, and are therefore able to know their world in some objective sense. All humans have the ability to examine and discover the truths of creation. As Christians, we correctly avoid a position of naive subjectivism, and affirm a commitment that includes both universal truth and personal commitment in the formation of theory.

It seems, therefore, that there is an implication that must be seriously considered, one that would be consistent with both the objectivity of the world and the fallenness of humanity. That possibility is that psychological theory may be a relatively accurate approximation of a reality which has been twisted by sin. The book of Genesis describes the results of sin as affecting all of creation. The physical world changed as well as the heart of humanity. As scientists created in God's image the possibility exists, therefore, that non-Christians can approach faithful descriptions of the reality discovered. The reason any theoretical description is inconsistent with the biblical perspective may be due not so much to the scientist's personal variance from the correct perspective, as it is due to the variance of the studied phenomenon from its created state.

A few years ago, I had the opportunity to talk with a young lady who was interested in psychology and was working with high school students in the mid-west. We were discussing the cognitive-developmental theory of morality developed by Lawrence Kohlberg. She rejected the work of Kohlberg because the values he described were "humanistic". While Kohlberg relies on Rawls (1971), and proposes a humanistic ethic of justice which has been criticized as ethnocentric (Simpson, 1974) and elitist (Fraenkel, 1978), that says nothing about whether Kohlberg accurately described the reality he discovered. It may be true that people should not be "humanistic," but it may be equally true that they are.

It seems that part of the description of humanness that our Christian faith gives us is idealistic. That is, it describes human nature as it ought to be. Psychological theory does the same thing. There is the portrayal of the healthy personality as a self-actualized state that is rarely if ever realized. These are more ideal goals than descriptive portrayals. The question to be asked is, "Did the scientist use a methodology which is appropriate for the reality being studied?" We must learn to recognize and accept any theoretical portrayals which are faithful to the reality being examined. As Christians, we must learn to ask critical and crucial questions. What methods were used? What variables were evaluated? What variables were over-looked? What are the alternative interpretations of the data? How could the study have been improved theoretically or methodologically?

As Christians involved in research, we need to be more disciplined. But such discipline encourages a more favorable view of science and theoretical activity than Christians have generally allowed. Added to considerations of objective reality and personal involvement in theoretical activity, we must consider the possibility of "faithful reflection." That is the possibility that the non-Christian's theoretical description is a relatively accurate approximation of the phenomenon being studied.

It is rare that Christians have a kind word to say about B.F. Skinner or about behaviorist theory. The typical critique is that people are free and have dignity because they were created in the image of God, and therefore they should not be manipulated or controlled by their environment. The problem with the critique is that people may be controlled or at least can be with little effort. The difference between the way things "should" be and the way they "are" needs to be recognized in all theoretical activity. A perspective like that of Carl Rogers is an ideal system. Self-actualization is posited as an end state towards which people should strive. It is rarely if every attained.

As Christians we need to recognize that not only has presuppositional thinking been twisted by a condition of sin, but so has the world in which we live. The psychological reality that we study is not what it should be (i.e. what God created it to be). It is changed and "groaning" for redemption. We need to examine the theories we use and confront not only their presuppositions, but also the methodology used and the phenomenon being described. Theories are the result of a dynamic interaction between the faith of the scientist and the reality being examined. We as Christians need to recognize that objective reality has been changed by sin, and that psychological theory may be a faithful reflection of that reality. It may be a faithful approximation of the reality as it exists.

Psychological theory is historically relative. It must change because we are gaining more information about the psychological make-up of humans, but it also may change because the reality we call psychological may be changing over time. We must examine such people as Freud, Piaget and Skinner; and such concepts as cognition, reinforcement and the unconscious. We must examine to see if the data reported are supportive of the theoretical concepts. We cannot just say these theories are to be rejected because they "should" not be that way. We must determine if the theory faithfully reflects reality.

As a Christian psychologist, I must be faithful to the objective aspect of reality, and I must recognize any theory that can give a meaningful interpretation to that reality. At the same time I must not abandon the ideal. Psychological theory can have a profound impact on the thinking of people and culture as Freudian psychoanalysis has demonstrated. I must strive for a theoretical interpretation which is faithful to Scripture, and which may have an impact on people. It will reflect the dignity and fallenness of humanity. It can minister to hurt people and it can change the very way we think about ourselves. It may change the very reality I am trying to describe. I must seek a theoretical view that results not from a mere restatement of biblical passages, but one that grows from a dynamic interaction between God's special and general revelation.

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T.L. Frisby

Candidate for PhD in Developmental Psychology at
Ohio State University
4664 Ralston Street
Columbus, Ohio 43214

Science and Finite Imagination

Although the physical sciences are principally concerned with a study of the physical universe, their impact goes far beyond the fields of their direct investigation. This is because the physical sciences, especially astronomy and geology, have given us information about the extent of the universe in both space and time. This in turn has given man a perspective of his place in the universe, and has been important in shaping his world-view. Thus modern man's self-perception is influenced by the findings of the physical sciences.

However these findings of the physical sciences often come from very complicated and highly technical experiments. Few people are able to read and evaluate all investigations of the physical sciences in the original research literature. Most of us are forced to follow the progress of science by reading condensed articles in periodicals and textbooks. Such condensed accounts are not always careful to distinguish clearly between experimental facts on the one hand, and theories and speculations on the other hand. Furthermore, such accounts are often written from a rather noncritical point of view. One is faced with the task of evaluating such secondary accounts for oneself, and of judging their impact on one's own world-view. This communication seeks to give a perspective to this task.

We begin by reviewing the main points of procedure and analysis in a scientific investigation.[1] For this purpose it is helpful to consider an example which is as nontechnical as possible. Yoder, Suydam, and Snavely[2] give a useful example that is used here with modification. Suppose we were to find a heavy, sealed steel box with two small holes. There is a rope coming out of each hole. Assume we have no means of breaking or opening the box. We wish to do a scientific investigation of the box and ropes. We label the two ropes *A* and *B* respectively. We begin by pulling on rope *A*. We observe that it can be pulled out of the box. We also observe that as rope *A* is pulled out, rope *B* comes out as well. We begin to measure the lengths of rope involved and find that the length of rope *B* that comes out is always three times the length of rope *A*. Conversely, we find that if we pull rope *B*, the length of *A* that comes out is always one-third the length of rope *B*. We conclude that no matter which rope is pulled, three lengths of *B* come out for every length of *A*. This conclusion is based entirely on observable, measurable facts.

By this time we are curious about the interior of the box. Since the box is sealed, we begin to imagine what might be inside. We make a list of possible models for the interior of the box:

1. Two spools of rope connected by gears with a three-to-one ratio.
2. Two spools on the same axle, but with one spool having three times the diameter of the other.
3. One spool wound with two ropes.
4. Two spools on two battery-powered motors. The motors are connected to a small computer. The computer senses motion of one rope and then runs the other motor at the appropriate speed to maintain a three-to-one ration.

The list of models could go on until our imagination runs dry. Clearly our imagination, not logic, generates the initial list of models.

We next use analysis, together with our experimental data, to try to eliminate all models that are inconsistent with the facts. In this case we can eliminate Model 3 because it would feed out the ropes at the same rate. On the other hand, Models 1, 2, and 4 are all consistent with all known facts. We may prefer Model 1 or Model 2 because of its simplicity, but Model 4 is possible and has not been disqualified. Thus we have shown that Model 3 is inconsistent, but we have not established any model as the correct one.

In scientific investigations of more complicated systems, one may be able to do more experiments and to eliminate all but one of the models. In such situations there is a strong temptation to regard the one remaining model as having been demonstrated to be correct. However, this is a fallacy. The original list of models is constructed from the investigator's imagination. Since his imagination is finite, there is no guarantee that he has thought of all possible models. Therefore the elimination of all but one model does *not* establish the correctness of the remaining one.

It should be noted here the "proof by elimination" is often used in mathematics. For example, if a real number can be shown to be not negative and not zero, then it must be positive. In this case one knows what all of the possibilities are, namely negative, zero, and positive. Therefore a "proof by elimination" is valid. By contrast, when investigating the physical universe, there is no way of knowing all of the possible models. The range of models we work with is limited by our finite imagination. Thus there can be no "proof by elimination."

Returning to the example of the box, we may summarize as follows. The facts are those things which are observable *outside* the box. If the box is not opened, we can never establish what is *inside* the box. The best we can hope to do is imagine one or more models that are consistent with the facts. We now apply these principle to several areas of physical science.

I. Atoms. The observable facts about atoms include such things as ionization potentials, emission and absorption spectra, chemical reactions, etc. One particularly important experimental observation was that of Rutherford[3] when he bombarded gold atoms with alpha particles and measured the angle of scattering. However, no one has made any observations of the inside of an atom. Thus the inside of the atom corresponds to the "inside of the box". All that we can "know" about the inside of the atom is to imagine possible models for what might be in there. For a model to be acceptable it must be consistent with the scattering angles measured by Rutherford, the emission spectrum of the atom, etc. One acceptable model is that the atom has a heavy, positive nucleus which is surrounded by electrons in orbitals. However we cannot be sure that this is the only acceptable model, or that this is the correct model. (It is true that this model is a *useful* idea in that it helps us "make sense" out of a large amount of experimental data.)

As a specific example, consider the reaction of a supercritical mass of uranium-235 in an atomic bomb. This is a so-called

"nuclear" reaction. The observed facts are that a large amount of energy is released, the uranium disappears, and other elements (e.g. barium and krypton) are produced. The model is that uranium atoms have nuclei which are split. The experimental data demonstrates that uranium-235 has a large internal energy and that it can be transformed into other elements. The data *do not* establish that uranium atoms have nuclei.

II. Earth. Observations of the earth include such things as seismographic data, the location of mountains, volcanoes, and earthquakes, etc. No one has made observations of the earth's interior below the bottom of deep mines and wells. Thus the interior of the earth corresponds to the "inside of the box". We seek a model for the earth's interior that is consistent with our observations. One model is that the earth has a crust, mantle, and core; and that the crust is made up of slowly moving plates. However, because of our finite imaginations, we cannot be sure that this is the only model consistent with our observations.

III. Geology. Geologists observe and measure such things as rock strata, argon-potassium ratios, fossils, etc. No one has made any observations of earth's prehistoric past. Thus a chronological account of earth's past corresponds to the "inside of the box". Imagining an acceptable model (historical account) for earth's past has not been easy, and controversy on this continues. Such a model may include statements about lengths of time, large-scale ecological changes, etc. However, regardless of what model is proposed, it is still subject to the same principles as all models—namely that it can never be unambiguously shown to be the correct model. There is no way of knowing that we have thought of, and eliminated, all other possibilities.

IV. The Universe. Astronomers observe and measure the angular position, brightness, color, red shift, etc. of starlight as it strikes the earth. No one has observed or measured actual distances between stars or between galaxies. Thus the size of the observable universe corresponds to the "inside of the box". One model for the size of the observable universe suggests it is at least many millions of light-years across (and probably much bigger). Furthermore, if the speed of light is assumed constant, this immediately implies that the observable universe is millions of years old. This model is certainly useful in organizing a vast amount of astronomical data. The correctness of the model, however, cannot be determined.

The above four examples are sufficient to illustrate the distinction between observable facts on the one hand, and the models we construct on the other hand. Keeping this distinction clearly in mind can be useful in reading and evaluating the secondary scientific literature. In particular, it is the models, not the observed facts, which tell the extent of the universe in space and time. Thus it is the models that influence man's self-perception of his place in the universe.

Such models may be highly useful in organizing data, planning experiments, etc. They may also be useful, at times, in developing one's world-view. However, as we have seen, the correctness of a scientific model can never be confirmed beyond doubt. Therefore it can never be used to establish the truth of any particular world-view.

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[2]Claude H. Yoder, Fred H. Suydam, and Fred A. Snavely, *Chemistry* (2nd Ed.), New York, Harcourt Brace Jovanovich, 1980, pp. 3-6.

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Norman E. Shank

Department of Chemistry
Messiah College
Grantham, Pennsylvania 17027

A Christian Sociology?[a]

Is there a Christian Sociology? Can there be a Christian Sociology?

Until recently, and within the discipline of Sociology itself, the most likely response to such questions would have been an emphatic, No! On the face of it, No! There can no more be a Christian Sociology than there can be a Christian Physics, or a Christian Engineering, or what not. Those assertions might be made at a certain level of annoyance (What kind of question is that for anyone of sense to ask?) or with a measure of condescension (My dear fellow, don't be absurd!) but the response would surely be to that effect. No, a Christian Sociology is not possible.

The questions, however, are not impertinent. That's the first point to be made. It is not absurd to ask. Is there a Christian Sociology; can there be a Christian Sociology? Recently, there has appeared *A Reader in Sociology: Christian Perspectives* (DeSanto, Redekop and Smith-Hinds, 1980), a collection of articles focusing on some of the major dimensions of sociological interest. Thirty-eight different writers are represented in the book's contents. Some of them explicity claim to be writing in a Christian sociological perspective; all of them were willing to have their papers included in a book bearing the subtitle, "Christian Perspectives." It is the case, of course, that "fifty million Frenchmen may be wrong," and that "what we say" and "what we do" are not necessary identities. Still, it is at least cause for notice (if not alarm) that so many persons, coming as they do from at least three different cultures, were willing to associate themselves in such an undertaking.

The notion of a Christian Sociology immediately raises the question of sociological study and its relationship to values. Ever since Max Weber's writings became generally available to sociologists in the United States, it has been virtually axiomatic to maintain that the formal study of Sociology is and must be value-neutral, *wertfrei.* Scientific analysis of any phenomenon must be objective, non-advocative. In so far as Sociology is scientific, there can be no "oughtness" implied by its content. These words of Weber's, taken from his essay, "The meaning of 'Ethical Neutrality' in Sociology and Economics," may be regarded as typical of the general stance.

> it may be asserted without the possibility of doubt that as soon as one seeks to derive concrete directions from practical political (particularly economic and socio-political) evaluations, (1) the indispensible means, and (2) the inevitable repercussions, and (3) the thus conditioned competition of numerous possible evaluations in their *practical* consequences, are all that an *empirical* discipline can demonstrate with the means at its disposal. (Weber, 1949:18; italics in the original.)

While not questioning a single word of Weber's claim, it is difficult today to understand how those sentences could have been read as "proof text" demonstrating sociological science (or indeed any science) as necessarily value-free.

The take-for-granted understanding that lies behind such a position, and behind the responses suggested in the first paragraph of this essay, is by no means as self-evident as it appears once to have been. The determined value-free stance of Sociology in the United States has somewhat eroded. It has been attacked as pretentious (Gouldner, 1961), as specious (Hoult, 1967) and simply as untrue (Becker, 1966). The general tone of the arguments can be summarized as follows. Whatever may be meant by "value-neutral," it cannot mean that sociological study is pursued in a manner completely divorced from the contingent means-ends contexts in which human life necessarily is located. Unless we assume human behavior to be completely non-voluntaristic (and that is itself a non-value-free assumption) we must take into account the notion of choice; choice entails some principle of selection, some value(s). Sociologists study this and not that. What is studied has ethical implications since, to oversimplify the point, the questions function either to question or to support the *status quo*. Moreover, and quite apart from the foregoing, the results of sociological inquiry are not emptied into a vacuum. People learn of them; they become a part of the residuum of understanding by which groups inform their behaviors. The findings and theories have consequences, and those consequences take their places in the line of causal variables which eventuate in behavior.

There is more. Facts do not "speak for themselves," as the popular folk wisdom maintains. A fact derives its meaning from a theoretical context in which it is anchored. All theories are not equally attractive. Some are more general than others; some are more parsimonious, more seminal and perhaps more productive of serendipity. They are better theories. But, what is this "better" if not the flag of a value judgement, a judgement that one makes in order to pursue science? Finally, it is quite clear that science is practiced by people, and people are inveterate pursuers of values, even as scientists. Peer standing is not simply a question of "time in grade," nor is the search for truth nearly as cool and dispassionate as scientific reporting and mythology would suggest (Watson, 1968).

It is against this kind of background that we should understand the question proposed at the opening of this essay. Some persons who identify themselves both as Sociologists and as Christians have associated the two words into a "Christian Sociology." Without at this point granting legitimacy to the term, we can say that their proposal cannot be dismissed *a priori*. It is not just they, but sociologists in general, and more generally still the scientific endeavor itself (Kuhn, 1970), which has come to be seen as intersecting decisions of value at various points (Friedrichs, 1970:111ff).

Christian Sociology? Why not? After all, we have spoken for some time of a Humanistic Sociology. The term has occasioned some criticism from time to time, but its general usage is indisputable (Glass and Staude, 1972). "Christian" is no more improbable than any other adjective—Humanistic, Marxist, whatever—as modifier of the noun, Sociology. This conclusion, however, serves only to return us to the questions: Is there a Christian Sociology? Can there be a Christian Sociology? The two questions form the major structure of the remainder of this paper. Because of basic difficulties experienced in reaching consensus as to meaning, we do not yet have a Christian Sociology. Those same problems of consensus make it unlikely that a fully developed Christian Sociology can be anticipated. If, however, we are willing to explore the subject within a context that remains open—and it surely is normative to science and to Christianity that we do so—the term "Christian Sociology" is by no means inappropriate for those who engage in sociological study and also are Christian.

Is There A Christian Sociology?

Is there a Christian Sociology? The question must be answered unambiguously, No, not at this time. If by Christian Sociology we mean something like "Sociology used in the service of the Church," then it could be granted that such a Sociology does exist. It is an unusual denomination that completely ignores social data in its planning procedures, or in its programs of service to others. That could be called Christian Sociology. For some time it has been European practice to distinguish between Religious Sociology and Sociology of Religion. The former term is understood as a subdiscipline of the latter, and Religious Sociology is seen as sociological theory and methodology applied to denominational programs (Boulard, 1960). Christian Sociology is an equivalent term to Religious Sociology.

Christian Sociology has also been used in the past as indicative of something like critique of the social order from the standpoint of selected theological principles ("The National Church and the Social Order," 1956). Again, it seems European Sociology has been more willing to explore the boundary between social theology/philosophy and social science than has Sociology in the United States, in the process producing some first-rate studies (cf. Wickham, 1957; Symanowski, 1964; World Council of Churches, 1967). Some of the monographs included in the H. Paul Douglass collection (Kraft, no date) could be included under this rubric. At the turn of the century, the first issues of the *American Journal of Sociology* included a nine-part essay, "Christian Sociology," by Shailer Mathews. Mathews was then Professor of New Testament at the University of Chicago (Mathews, 1895). The series was soon reprinted, "to a considerable extent rewritten," under the title, *The Social Teachings of Jesus* (Mathews, 1897). The altered title fairly reflects the actual contents of the essays, for they are social philosophy and not formally Sociology.

It is time for a definition. Christian Sociology is the systematic study of the social order that, in its theory, methodology and reporting is explicitly related to the framework of understanding that is identifiably Christian. Discussion of that definition will argue that while such a Sociology does not yet appear, its possibility is both practical and desirable.

Christian Sociology is not social criticism, although, like any other Sociology, it may produce materials which could be used in such a critique. A Christian Sociology is not necessarily more (or less) critical than any other kind of Sociology (cf. Berger, 1963; 38f: Sociology as a 'debunking' activity). It probably would be a serious mistake for a Christian Sociologist to seek too carefully to distinguish himself from his non-Christian colleagues; it surely would be a waste of time. There are no facts that are "Christian" as opposed to facts that are "non-Christian."

It is rather the framework of meaning within which the Christian sociologist works *qua* sociologist that identifies the person as such. A Christian may be a sociologist, and not necessarily engage in Christian Sociology. The practice of Christian Sociology is not something that just happens, any more than the Christian life consists solely in refraining from deliberate evil. Christian Sociology begins in the values which guide the sociologist in her work. From the moment a research problem is selected, the major context of one's identity, Christian, will inform the undertaking. In planning the methodology, in interpretation of results, in proposals for intervention on the basis of the findings: each of these steps in process are engaged within the framework of sociological and Christian understanding. This is done deliberately, intentionally, accountably.

It is necessary at this point to introduce a caveat. The formal defintion of Christian Sociology proposed above is in a sense misleading, for it assumes that its major terms are unambiguous. The "framework of understanding that is identifiably Christian" is a pretentious phrase to the extent that agreement on its meaning is debated amongst the various denominations of the Church. In this context, sociologists are no better arbiters than their non-sociologically trained fellow Christians. Christian is an "ideal-type;" it does not directly correspond to an empirical referrent, and is useful for heuristic purposes. Disagreement on criteria for this "type" constitute a limitation on its usefulness; and it does not advance that usefulness to qualify the word with such limiting words as "real," "genuine," or even "Christian" as opposed to Christian. (cf. DeSanto, et al, 1980: passim).

It is possible to make a kind of virtue of this lack of consensus. Not only inter-denominationally, but intra-denominationally, differences in belief and behavior patterns are commonly reported. (Marty, *et al,* 1968). Perhaps this variation serves as a spur to all, honing the edges of belief to sharper point that might be expected in a more sanguine, because more consensual, system.

In whatever way we understand denominationalism, however, it constitutes a fundamental caveat to the development of a Christian Sociology. It would be comforting to believe that churches "really" believe the same thing; it is a fact of experience that they do not. In so far as disagreement impinges on the basic framework of the meaning of "Christian," it remains a question limiting any attempt to erect a Christian Sociology. Attempts to present a "mere Christianity," (Lewis, 1954) lack the precision of definition required for the word to pass muster as the first term in the pair, Christian Sociology. It is for this reason, as much as any other, that we conclude this section by repeating the assertion, there is not a Christian Sociology, not at this time.

Can There Be A Christian Sociology?

The recent rethinking of the integral relationship between values and scientific study has allowed for raising the issue of a Christian Sociology. Ambiguity of terminology, rather than inherent value orientation, constitutes a major barrier to emergence of such a perspective.

Is the barrier impermeable? Can there be a Christian Sociology? Let us now argue that the question is capable of answer, "Yes, it is possible." It will, however, be a Sociology that is both Christian and scientific; to say it another way, it will be a Sociology that conforms to both the contingent nature of religious and of scientific understanding.

A scientific discipline may be internally distinguished among three separate issues: the theoretical, the methodological and the empirical. In terms of these units we can apprehend something of the nature of a developing Christian Sociology.

(At this point it may be noted that ours is not the first attempt to develop a prolegomena to Christian Sociology. In the early 1950's, Jones (1951) proposed to examine "Some Presuppositions of a Christian Sociology." His essay, however, was written in the tradition of what has been previously characterized as the "European" approach, and is more properly seen in the light of principles of social criticism, hence, as social philosophy. An essay of the same title by Heddendorf (1972) is more clearly directed to the kind of orientation that informs this paper: developing a rationale which can lead to Christian Sociology as previously defined.)

Theory, like any other tool of the sociologist, is neither Christian nor non-Christian. It can be a greater or lesser utility, parsimony, generality, or whatever other criteria one may choose for evaluation of competing theoretical stances. Some of its possible implications may be non-Christian; but the theory itself cannot be dismissed in that fashion. For example, it surely is non-Christian to conceive of humanity as *homo oeconomicus,* if by that term one intends to define the essence of the genus, *homo.* It is, on the other hand, equally sure that there are certain utilities in conceiving man as such under certain conditions. For theoretical purposes, humans may be thought of in such a way. The Christian cannot fail to be aware that man is so much more as well.

The illustration may serve to alert us to an important axiom of Christian Sociology. Christian sociological theorizing would be self-consciously aware of the selective, partial nature of its propositions. Its formulations would be stated in such a way as to imply the question: How far can our understanding of the social order be advanced if we conceive of mankind in *only* the following dimensions? Of course he is more; but within the limitations of this set of propositions, is our understanding advanced? That would be the limiting, the narrowest approach to the interrelationship between social theory and Christian belief.

On the other hand, the Christian can critique theory in the positive sense of seeing it is too narrow or horizonless to do full justice to man as a child of God. A theory, for example, which reduces human activity to mere response sets, whether biological, psychological or social, is inadequate to human nature. Theory in a Christian Sociology would always be oriented towards the outer borders ("it doth not yet appear what we shall be...")

There is an irreducible tensionality between the experienced and the anticipated. The "nothing but" limitations of some theory may be useful for temporary exploration, but their partial and limited framework will always be dissolving as further questions are asked. For the Christian, there must always be more to life than meets the eye, or is encompassed within the regions of theory. The Christian is aware of this double dimension: a person saved and being saved; a saint who is a justified sinner; a citizen of two worlds, of a Kingdom which has come and is coming; the paradox of grace: that all is of God, yet man must do his part. In these and many other ways Christians are anchored in the dialectic of life. This experience of incompleteness, the transcendent and immanent dimensions of the experience of God: these become axiomatic in formulating social theory, and are an important aspect of what a Christian Sociology would include.

Would Christian sociological theory offer categories of explanation that are not available to the non-Christian sociologist? It would not seem so, not in any direct sense. For example, it sometimes is suggested that a category such as "sin" could be employed by Christians in their understanding of some social facts. It would seem that to do so would constitute an illegimate translation of a theological category into non-theological contexts. We can't "know" sin, for we cannot know the human heart. What we can know is that things don't work out, that expectations and performances are contingent, that what people say and what they do differ, and that man is devious in his ideologies and destructive towards others and towards himself. Christians are probably able to take a more unapologetic view of the human condition (Heddendorf, 1972), for we have no "need" to preserve any hidden assumptions of self-sufficiency. Rather, Christians can face the fulness of the human condition (Dooyeweerd, 1980); man errs by intention as well as through ignorance. Important as these considerations are to Christian understanding, they do not figure directly in social theory, but are related to it more in the nature of axioms.

Methodologically, the situation is somewhat different. Some methods of research would appear closed to the Christian sociologist. Deception, experimental conditions that are demeaning to the subject, or which violate personhood, are not options.

Perhaps, one could see in this a necessity that could make a Christian sociological methodology a major source of innovation. Lacking some of the more common data gathering contexts (e.g. deception), a search for reliable alternatives could be productive, and valuable to the discipline.

Other than these considerations, there seems to be no reason why Christian sociological methodology would differ from sociological methodology in general. There is no *a priori* need to exclude certain areas from possibilities for research. Whatever is of human activity or of human institutions is of concern to God; therefore to His people. Indeed, there is some reason to believe that Christian Sociology could offer expanded horizons in social research that has tended to be narrowly confined in its interests. More than one writer has noted that sociological investigations have focused on "problems" in the negative sense of the word, and have only occasionally sought to understand more positive aspects of human behaviors. Conflict rather than altruism, Machiavellianism rather than liking and loving, disorganization rather than consensus, seem to have attracted the more excited (and exciting) studies. Only recently has it been proposed that such an area of human behavior as "spiritual well-being" could be a focus for research, and that only in a tentative way (Moberg, 1967, a, 1967b, 1971, 1979).

The relationship of Christian Sociology to the empirical occasions two or three sentences. It is hard to see how data can be other than they are, for Christian and non-Christian. Cell percentages, chi-squares and other quantitative measures would not differ. On the other hand, qualitative analyses of human behavior, since they are more directly related to the notions of value, bring us full circle, and we are once again at a point where scientific study and value commitments intersect. It also is the point where we must candidly face some of the possible dangers in a Christian Sociology.

Christianity is a value commitment. In this it does not differ from the value commitments of humanism, scientism, Marxism, or any other -ism available for human commitment. Life does not explain itself, and there is no certain point outside the life processes where we might stand in order to have an overview of the whole. As a Christian sociologist, one does not escape this "givenness" of axioms. One may be certain "God was in Christ reconciling the world to Himself;" but that claim can have no epistemological status superior to other claims. In the final analysis, does Christianity provide the sole perspective in terms of which reality may be understood? That is a faith statement, and the Christian sociologist must be certain of the relationship between such faith and the practice of the discipline.

Answering the Question.

Can there be a Christian Sociology? Indeed, Yes. What would it be like?

A promising beginning has been made by Alan Storkey (1979) in a book that surveys the major institutions of a society, examining each from the standpoint of what Storkey has previously developed as a Christian perspective. The book is exciting; it both disappoints and delights. Strokey's analysis of the Family is especially insightful, but it also provokes doubt, for while not formally enjoined, the traditional patriarchal family appears to be considered normative. There are, in addition, serious failures in definitional precision and consistency (for instance, his "free institutions" distinction appears to this writer as both unclear and inconsistent). The criticism is not academic, but neither is it intended as indicating fundamental disagreement. Storkey has made a fine beginning in a very complex area.

In some sense, it is easier to delimit a non-Christian than a Christian Sociology. Of course! A Christian Sociology inevitably is partial, emergent, just as science is emergent and partial. Whether or not there can be a Christian Sociology depends on the work of this generation of sociologists who are Christian. It also will depend on the next generation.

The current openness of Sociology to questions of value is probably a reflection of the changed normative context of today. Reading again through Gouldner's article (1962) one is impressed not so much by the cogency of its reasoning: Gouldner was often strident and assertive. He did, however, sense quite early the currents of change and it was those that he proclaimed. Other changes may occur, and willingness to investigate value commitments in science may fade.

But, the issue of Christian Sociology will remain. It is one of the alternate realities (LeShan, 1976) which can inform human behavior, and can be a legitimate perspective from which to interpret that behavior. For the Christian it is much more; but for now, in theory and practice, it can be an important sensitizer (Friedrichs, 1970:129) to social understanding. It is out of such commitment that a Christian Sociology may emerge.

[a] *In memoriam: RWB.*

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George W. Barger

Department of Sociology
University of Nebraska at Omaha
Omaha, Nebraska 68182

The Spirituality of Teilhard de Chardin: An Evangelical Critique

"Teilhard de Chardin was a great evolutionary thinker. . .he was at the same time a mystic with a vision as great as St. Augustine's" (Jones 1969; p. 15)

". . .the greater part. . .is nonsense, tricked out by a variety of tedious metaphysical conceits. . ." (Medawar 1961; p.99)

Such is the impact of Teilhard de Chardin that his work and life can be considered as equal to Augustines' or simply dismissed as sheer nonsense. This paper provides an evangelical assessment of the spirituality of Teilhard, especially as his conceptions of spirituality impinge upon questions of theological orthodoxy.

The relevant background of Teilhard's life is relatively simple. Trained in the Jesuit tradition, Teilhard was professionally a paleontologist of some distinction and with a minor detour as an ambulance corpsman in World War One, spent most of his life in the East. It is in the East that he made his paleontological contributions; especially significant is his work in the discovery and description of Peking Man (*Sinanthropus*). Due to the heterodox nature of his writings, he was forbidden to publish his non-scientific material during his life and so his writings come to us after his death in 1955.

The key to understanding Teilhard lies in an understanding of his conception of the natural order and specifically his philosophical explanations of the evolutionary process.

Extrapolating from the purely scientific level (i.e., micro- and macro-level evolution), Teilhard considers four steps of "genesis" (Teilhard 1960). The first step of this grand evolutionary process is the transition from matter to life (morphogenesis to biogenesis). The second step in the process is from life to man (biogenesis to anthropogenesis). Going beyond mere biological analysis, Teilhard posits a third stage of evolution, the movement from man to Christ (anthropogenesis to Christogenesis). Finally, Teilhard posits as the final stage, the "Omega Point" where all will be "Christified."

The Teilhardian synthesis is basically a model of *directed* evolution. Teilhard states this "directedness" in the following manner, "The delight of the divine milieu. . .is that it can assume an ever-increasing intensity around us" (Teilhard 1960; p. 132). Such a schema has great appeal to the modern, Western mind and in fact even as secular an evolutionist as T. Dobzhansky can consider Teilhard's system as "fitting the requirements of our time" and as providing a "ray of hope" for the 20th century. (Dobzhansky 1962; p. 348).

The question remains however whether or not the Teilhardian proposals can be considered as biblical or evangelical. Before considering this, several other main points of Teilhard's thought need be considered.

Firstly, he considers Christianity as "nothing more nor less than a 'phylum of love' within nature" (Teilhard 1960; p. 15). A second main emphasis in Teilhard's thought is a conception of evil as moral failure rather than of sin as a condition of our existence (Teilhard 1960; p. 85). A final major theme in Teilhard's thought is his unique idea concerning the cross and atonement. Briefly, according to Teilhard, the concept of a cross of expiation is replaced by the idea of a "cross of evolution" with Christ conceived as the apex of man's spiritual evolution (Teilhard 1971; p. 216f.).

Barbour raises two cogent objections to Teilhard's science (Barbour 1966): Is sociology really reducible to biology as Teilhard does in his four-fold scheme of evolution? Do we truly want to advance a substantially Lamarckian view of evolution for the currently prevailing non-Lamarckian view? Finally, Barbour contends that Teilhard's emphasis upon the "incompleteness" of God implies a non-contingent universe and hence a non-sovereign God (Barbour 1966; pp. 404-405). Thus, from a purely scientific perspective, Teilhard's synthesis appears to be seriously flawed. However, to be fair, it must be admitted that this analysis of Teilhard's is not really a scientific one but a philosophical one.

The first major objection to Teilhard's theology arises in the discussion of the nature of evil. Teilhard conceives evil as a failing and not as a condition (Teilhard 1962; p. 269). This, combined with his evolutionary optimism (even in the face of *two* world wars!), produces a mistaken view of the nature of sin. As Berkhof phrases it, Teilhard's "uncritical extrapolation from his biolog-

ical-anthropological categories could not have done justice to the great realities of sin and reconciliation" (Berkhof 1979; pp. 174-175). Also, as Bloesch points out, this conception of evil as finitude is common to the mystical tradition and contrary to the biblical emphasis upon sin as active rebellion against God (Bloesch 1980; pp. 105-106).

A second major theological difficulty encountered in Teilhard's thought concerns the question of the sufficiency of Christ. The basic evangelical perspective is that there exists a chasm between God and man and that man's inability to repair this break necessitates an historical mediator, Christ. Further, this act is complete in and of itself; we add nothing to it (Bloesch 1980; p. 101). Teilhard, on the other hand, argues that "Christ is not yet fully formed" (Teilhard 1961; p. 133) and we are to "plunge into God" (Teilhard 1961; p.133) to become united in creative "union with the Eucharistic Cosmic Christ" (Teilhard 1960; pp. 131-132).

Here we see a third misplaced emphasis in the thought of Teilhard: the "Eucharistic Cosmic Christ." While no evangelical could or would deny the cosmic implications of the life, death and resurrection of Jesus of Nazareth, the emphasis of Teilhard is more on the "idea" of Christ than upon the Palestinian rabbi of the New Testament. At one point for example, Teilhard refers to the "living and conquering idea of the universal Christ" (Mooney 1966; p. 73).

In this he betrays a marked docetic tendency. For example, he argues in his "Mass on the World" that he "shall rise beyond mere symbols to the pure majesty of the real, and I shall offer you" (Teilhard 1979; pp. 119-134), or, in the criticism by J. Houston, "Teilhard makes much of the cosmic Christ, but has little to say of the incarnate Christ" (Houston 1980; p. 170). This docetic strain of thought is also evident in Teilhard's concern for matter. For him, "true repose consists in renouncing one's own self. . .my life is now possessed by this 'disinterest' " (Teilhard 1962; p. 160). Berkhof again criticizes Teilhard on this point of matter and spirit when he argues that Teilhard's understanding is predominantly Greek and not biblical (Berkhof 1979; p. 536).

Thus, from the theological perspective, we can see several flaws within the Teilhardian analysis. Firstly, his emphasis upon sin as failing and his belief in evolutionary process and progress tends to a non-biblical monism and an unwarranted optimism concerning human effort. Concerning his optimism, Kung writes, ". . .evolution still seems very far from the omega point and often even to lead away from it" (Kung 1976; p. 39). This criticism is most cogent if we are to constantly proclaim the evangelical doctrine of total depravity. Rust also criticizes Teilhard's conception of sin as simply a concern for sin as a "statistical" rather than as an existential phenomena (Rust 1969; p. 175).

A second reservation that must be made from the evangelical perspective is that Teilhard's "co-creative union" of man and God is not biblically correct. We must rather maintain that true prayer is "God calling out to humanity and calling for a response of obedience" (Bloesch 1980; p. vii) and not a "mysticism of co-creative union" (Martin 1968; p. 112).

Finally, we must resist the Greek and neo-Platonic emphases of Teilhard. Matter and soul are not separated and our goal is not to escape the physical matrix of our body as in Teilhard. No, the evangelical insistence upon the resurrection of the body disallows such a dichotomy. Again, as Berkhof reminds us, "Teilhard's understanding of matter as the matrix from which spirituality will eventually escape. . .appears not to be in line with the way in which the biblical thinking constantly combines body and soul" (Berkhof 1979; p. 536).

Before considering the more specifically spiritual matters which Teilhard discusses, it is useful to consider a bit of Teilhard's religious background. Grau argues, and I think correctly, for the importance and centrality of Jesuit thought and practice for the life and spirituality of Teilhard (Grau 1976). He argues that the central theme of this type of spirituality is an "active-contemplative mentality" (Grau 1976; pp. 45-47). Thus, he argues that a constant theme in Ignatian spirituality (and thus present in Teilhard) is an "effort directed toward prayerful assimilation of the human culture" (Grau 1976; p. 46).

With these thoughts in mind, we can now consider the spirituality of Teilhard. Briefly, Grau distinguishes several stages in the daily prayer life of Teilhard. Firstly, the practitioner is to place himself in the presence of God. Secondly, the individual is to compare his life with his ideals and finally after this comparison is to carry out corrective measures (Grau 1976; pp. 83-85).

This essential inwardness of the Teilhardian spirituality is also evident in Teilhard's own writings. As an example, consider his previously mentioned "disinterest" as in his letter, ". . .true repose consists in renouncing one's own self. . .my life is now possessed by this 'disinterest' " (Teilhard 1962; p. 160). Also, in a letter to Abbe Breuil, Teilhard states this inward orientation more explicitly, "The more I look into myself, the more I find myself possessed by the conviction that it is only the science of Christ running through all things" (Teilhard 1962; pp. 85-86).

In a sense then, this Teilhardian orientation is basically an extrapolation of the early Church's concept of the "divinization of man" to the eventual "divinization" of all of creation at the Omega Point. This inwardness extends also to Teilhard's conception of Christian sainthood wherein one is a saint "who Christianizes *in himself* all the human of his own time" (Cuenot 1965; p. 403). At this point, the evangelical insistence upon the essentiality of transcendence is virtually lost.

Finally, Teilhard overemphasizes the mystical, ahistorical themes to the detriment of the evangelical affirmation of the historical nature of revelation. Our previous comments on the "Eucharistic Cosmic Christ" are relevant in this connection also. With this emphasis upon the "idea" of Christ, rather than on *Jesus* Christ, Teilhard adds an emphasis upon the "idea" of humanity and little stress upon the individual man (Schwarz 1979; p. 122). Teilhard is in conflict with the New Testament interest constantly shown in real people, and not merely "humanity."

How then are we to assess the person and phenomena generated by Teilhard de Chardin? Is he the "paradigmatic Christian and mystic of the utmost probity" (Cunningham 1980; p. 54) or, is he an important, but fundamentally theologically incorrect modern thinker?

We cannot agree with Cunningham that "Teilhard should be a saint for the nobility of his attempt to be faithful to the Gospel" (Cunningham 1980; p. 55). Mere goodwill does not make a saint! Rather, we must conclude that in many theological areas Teilhard is in no way biblical or evangelical.

However, we must also contend that his stress upon the dynamism of the Christian faith is an important and essential antidote to a sterile and stagnant propositional orthodoxy: a position conservative evangelicals are ever prone to stress. Also, his insistence upon creation and the "goodness" therein, while extreme, is a useful counterpoint for the common denigration of thw world or the common anti-intellectualism of the more fundamentalist of our brethren.

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Terry A. Ward

2207 Thunder Ridge Blvd.
Apt. 2-A
Cedar Falls, Iowa 50613

Creationism and Inerrancy

Among the many claims that have been made by leaders of the "scientific creationism" movement is the claim that special creation and biblical inerrancy are logically inseparable. Henry Morris in his *The King of Creation* insists that those who want to be adherents of biblical inerrancy should logically also be adherents of creationism. He laments the fact that in the past, creationist efforts failed to get the International Council on Biblical Inerrancy to incorporate literal-day creationism and a worldwide flood into the Chicago Statement on Inerrancy. He is disappointed by those inerrantists who will not take a stand for scientific creationism. He argues that we should believe the literal reading of the creation account, and that failure to do so by adopting some interpretation that seeks to make room for the geological ages is in effect an acknowledgment that there are grave errors in the biblical account of creation. Morris also concludes that failure to maintain creationism will inevitably lead to a rejection of the Bible's errorlessness.

Evangelical acceptance of Morris' contentions would effectively drive some leading inerrantists out of the inerrancy fold, and place them in a highly anomalous position. Perhaps the doctrine of biblical inerrancy has received its most thorough development in the writings of the theologians of the Presbyterian Princeton-Westminster tradition. The idea of the errorlessness of the Bible in all matters, including statements of scientific, historical, and geographical interest, was most carefully articulated by such nineteenth century theologians as Charles Hodge, Benjamin B. Warfield, and A. A. Hodge at Princeton Theological Seminary. These men were the leading spokesmen for inerrancy in their day. Yet in spite of the vigorous espousal of inerrancy these men where not literal creationists. Hodge in his *Systematic Theology* clearly supports the efforts of contemporary geologists to teach the antiquity of the Earth and argues that such antiquity presents no conflict with the biblical record. The days of creation, he said, could easily be viewed as long time periods. B. B. Warfield, although he retreated from an earlier commitment to evolution, always argued that the Earth could have been very old. A. A. Hodge clearly agreed with the geological conclusion of the vast antiquity of the Earth in *Outlines of Theology.* None of these men were literal creationists. Must we reject them as impostors in the inerrancy camp?

The Princeton theological tradition has been carried on by Westminster Theological Seminary in the twentieth century. To be sure, Princeton Seminary is no longer committed to inerrancy, but any claim that such departure from inerrancy happened because of the failure of the older Princeton men to adhere to creationism is not sustained by the historical facts. Westminster has continued the strong commitment to inerrancy that was a hallmark of the old Princeton. Westminster's position has been articulated in a faculty symposium *The Infallible Word* and in E. J. Young's *Thy Word is Truth.* But Westminster Seminary has never been committed to literal creationism. Of Westminster's Old Testament Theologians E. J. Young thought the days of creation were not necessarily 24 hour days, Meridith Kline is an adherent of the framework view of Genesis 1, and Ray Dillard of the present Old Testament department is not a literal creationist. Shall we now charge Westminster with a false view of inerrancy because it does not support literal creationism?

Creationism's linking of inerrancy and literal creationism does grave injustice to these inerrantists (and a host of others) who have earnestly wrestled with the text of Genesis 1 and made an honest effort to understand exactly what it is that God is saying there.

Creationists might counter that in spite of the professed sincerity of the above men in dealing with the text they simply avoided the plain literal sense, the sense intended by the writer. The difficulty here is that creationists, too, stand condemned by their own charge. Not even creationists take the text literally without doing plenty of "interpreting." For example, we read that God placed

lights *in* the expanse of sky on day four, and we are told that on day two the firmament divided the waters and that some of those waters were placed *above* the expanse. Now a literal reading would lead to the conclusion that the heavenly waters are above the sun and moon and that the latter are actually in the sky where the birds fly and not in outer space. If one believes that day two speaks of an upper atmospheric vapor canopy (which is, of course, not literally in the text but an inference) then the sun and moon must be below the canopy. Creationists do not believe that and so generally do not accept the literal reading of day four. Instead they interpret the text so that the text is said to speak the language of appearance rather than literal truth.

A literal reading of the description of day four seems to indicate that the sun and the moon (and incidentally these are not identified as such in the text) are the biggest objects in the sky. But reliable scientific measurements show that the sun and moon are not literally the largest objects so the common interpretaion of the text (and the one adopted by Calvin) is again to say that Scripture speaks the language of appearance.

The creation account does not mention that there was an evening and morning for day seven. The conclusion to be drawn from a literal reading might be that the day did not end (the text does not say that it did), but the text is *interpreted* by creationists to teach the conclusion of the seventh day because they think the days must have been 24 hours long.

In the Genesis record we are told that God created the earth. The Hebrew word for earth, however, refers to land or the solid inhabited surface. The word does not contain any ideas about a globe-shaped planet. The Hebrews likely did not think of the Earth in those terms. Hence to speak of the creation of a globular planet Earth is an *interpretation* of the language in terms of our scientific understanding and not the literal meaning of the text.

With regard to the days, even these are *interpreted* as 24 hour days. The literal reading does not necessarily imply that the days were that long. *If* the days were defined by alternating periods of light and dark we interpret the text by assuming that the Earth was rotating on its axis at this time. But Dillmann says that the text says nothing whatever of rotation. We read into the text when we speak of rotation.

Now I happen to agree with some of these creationist *interpretations*. What I want to stress is that they are interpretations that are not necessarily based on a literal reading of the text. In the same way most creationists have also interpreted those biblical texts that, when taken literally, would imply geocentricity.

My conclusion is that if creationists want to say that Christians who do not hold to literal creationism and the literal reading of Genesis are being inconsistent with inerrancy, then they must include themselves as inconsistent inerrantists.

Adherence to inerrancy does not lock us in to one interpretation, but grants us the freedom to interpret the errorless text as faithfully as we can in order to understand as best we can through the direction of the Holy Spirit exactly what it is that God is saying to us.

Davis A. Young

Department of Physics
Calvin College
Grand Rapids, Michigan 49506

Public Policy and The Alcohol Fuel Binge

As the world advances closer to the next century and demand for oil is exacerbated, two things are apparent: that the supply of oil is decreasing; and that everyone has a stake in the development of alternatives to crude oil and its derivative—gasoline. Attention has been focused in the last several years on the production of both synthetic fuels and gasohol. It is imperative that we address the production of ethanol or ethyl alcohol as an integral part of both national and international alternative energy sources. As the second of three areas in the Association for Public Justice's research project, "Justice for the Land; Land for the caring", gasohol production deserves our immediate attention, as does the public policy (state and federal) that propels its development.

It seems the American Congress and various state legislatures went on an alcohol fuel binge in the late 1970's and 1980. Tax breaks, loans, and price guarantees were among the ways they chose to help spur production of alcohol fuels.

According to *Congressional Quarterly,* their efforts paid off. Gasohol was not widely available in 1977 and sold at only a few hundred outlets in 1979. But by the end of 1980, "more than 9,000 service stations sold the fuel, and total consumption for the year was expected to exceed 100 million gallons of alcohol, or 1 billion gallons of gasoline."[1] The leading seller was Texaco.

After defining the technical aspects of gasohol (ethanol) production, this paper considers the economics of gasohol, certain environmental effects, and finally the political impacts of a move toward wider use of this energy source. A quantitative evaluation of net energy results as well as a discussion of the "food vs. fuel" dilemma is also included.

Technical Aspects of Gasohol Production

Ethanol or *Ethyl Alcohol* is a flammable organic compound (CH_3CH_2OH) formed during a sugar fermentation process where green plant life is distilled to extract the given substance. Gasohol, in turn, is a mixture of one part ethanol and nine parts unleaded gasoline for consumer use in automobiles with conventional internal combustion engines.

The production of gasohol requires two primary factors: ethanol distillation facilities; and their feedstocks. According to a 1979 report by the Office of Technology Assessment entitled *Gasohol: A Technical Memorandum,* "although ethanol can be produced from any feedstock capable of being reduced to the proper sugars, present U.S. production technologies rely on sugar and starch feedstocks. Suitable ethanol crops include corn, wheat, grain, sorgham, sugar cane, sugar beets, sweet sorgham and Jerusalem artichokes."[2] There is no "best" ethanol crop since different crops are superior for ethanol production in different soil types and regions of the country. Presently Iowa corn is by far the leading energy farm crop.

The ethanol conversion process itself takes place in four basic steps. First, the feedstock is "treated" in order to produce a sugar solution. The sugar is then converted in a separate step to ethanol and carbon dioxide by yeast or bacteria in a process called fermentation. The ethanol is then removed by a distillation process which yields a solution of ethanol and water that cannot exceed 95.6% ethanol (at normal pressure) due to the physical properties of the ethanol-water mixture. Finally, the water is removed to produce "dry" ethanol. This process is accomplished by adding to the solution a chemical that changes these physical properties and through a second distillation process.[3]

The material which remains after the ethanol is distilled away, called "stillage," contains dead yeast, bacteria, and the material in the feedstock which was "hot" sugar or starch. Grain feedstocks, for example, produce a high protein stillage (called "distillers' grain") that can be used as an animal feed, while sugar and cellulose feedstocks produce a stillage with little protein and less feed value. At the present time, exact nutritional values of distillers' grain in its various forms remain uncertain, although this subject is currently under research.[4]

It should be noted that there are numerous hazards particularly of burns, suffocation, and spillage that need to be considered in the production and storage of ethanol. Currently, the Bureau of Alcohol, Tobacco and Fire Arms (BATF) is responsible for issuing permits to individuals and corporations before production is allowed.

Net Energy Results

There is presently clouded information on whether gasohol does in fact produce positive net energy results. A study completed by the David, Hanmaher, Buzenberg and Wagner consulting firm that appeared in the *New York Times* on May 19, 1979 suggested that in the overall production of gasohol, there results a net energy loss. This study argued that 41,000 BTU's are used to grow the corn from which the ethanol is distilled. In addition, 131,000 BTU's are used to ferment and distill the ethanol, combining for a total of 172,000 BTU's of "input" energy. The calculations for "output" energy were as follows: 84,000 BTU's of energy for each gallon of ethanol and 50,000 BTU's of energy value from the feed grain by-product totalling 134,000 BTU's of energy for each gallon ethanol. Thus, it was concluded that an energy deficit of 38,000 BTU's results in the ethanol production process.

To counter this analysis, Barry Commoner and Richard Carlson of the Center for the Biology of Natural Systems argued that the *New York Times* article had gross miscalculations, and that ethanol energy production produces positive net energy results. The counter-claim suggested that research done by Paul Middaugh at South Dakota State University proves conclusively that energy expenditure of no more than 40,000 BTU's per gallon of alcohol should be needed in the fermentaion, distillation and by-product recovery. "It is also important to note that only two-thirds of the original corn is consumed in the fermentation process; the remaining third is very useful."[5] Using other evidence Commoner added that alcohol production should be charged with only two-thirds of the energy required to grow corn—about 27,300 rather than 41,000 BTU's per gallon. These corrections reduce the energy needed to produce one gallon of ethanol from 172,000 BTU to 67,300 BTU's.

When these considerations are taken into account, Commoner and Carlson conclude that the net energy gain is 91,700 BTU per gallon of ethanol. This is the case because it takes 67,300 BTU's to produce a gallon of gasohol, whose replacement represents 159,000 (159,000-67,300 = 91,700) BTU's net energy.[6]

Since Commoner's report, there have been at least two additional studies on the net energy result of ethanol production. The nature of these two reports further complicate the issue demonstrating that various factors, when included or excluded, have a significant impact on the net energy calcuation.[7]

Gasohol Economics

Ethanol plants have sprouted like Iowa corn. In fact, U.S. production of ethanol in 1980 had doubled (by August) over 1979 production to 135 milion gallons annually. Although there are no exact figures, the U.S. Department of Energy has stated that the production of gasohol reached 300 million gallons by the end of 1980. Frost & Sullivan, a Wall Street Research firm has concluded that a goal of 920 million gallons of ethanol by 1982 and 10 billion gallons by 1990 is an altogether realistic goal.[8]

In 1979 ethanol for motor fuel was an $80 million industry. By 1980 it grew to $250 million and there was every evidence to suggest that this trend would continue. These figures uncover the reality that private as well as government sources have, seemingly for the next several decades, invested a great deal of capital into ethanol production and a large promise in this agri-energy business.

A 1979 DOE Report says that current rates for ethanol range between $1.20 and $1.60 per gallon. The report stated that "by employing advanced, available technology, optimized for energy and cost savings, our studies show that ethanol could readily be produced for less than $1.00 per gallon and sold profitably for around $1.00 per gallon if produced in a plant with as much as a 50 million gallon per year capacity."[9] The report goes on to admit that a key is reducing *net* feedstock costs. Corn, for example, sold for about $2.50 per bushel in 1979. Since one bushel of corn yields about 2½ gallons of ethanol, the feedstock alone would be $1.00 per gallon, unless the values of corn products are recovered. This research emphasized that feedstocks need to be viewed as part of a processing system—not as raw materials for ethanol alone.[10]

Gasohol: A Technical Memorandum agrees that ethanol costs are influenced by the capital investment in and financing of the distillery, distillery operating costs, and byproduct credits. For a coal-fired 50 million gallons per year distillery using starch feedstock, the capital related charges are approximately $0.35 to $0.45 per gallon of ethanol,[11] assuming 100% private equity financing and a 13% after tax return on investment. The two major operating expenses are fuel and feedstock crops.

With corn at $2.50 per bushel, the corn grain costs $0.96 per gallon of ethanol and the byproduct credit is about $0.38 per gallon, resulting in a net feedstock cost of $0.58 per gallon. Because of the extreme volatility of farm commodity prices, $0.50/bu. increase in corn grain prices for example, would raise the ethanol cost by $0.12 per gallon.[12]

In addition, costs for transportation and delivery are higher at this time due to the fact that tank trucks are used. If other forms of transportation were developed to move the ethanol in larger volumes (barge, rail, or pipeline) this could lower costs by as much as $0.03-$0.05 per gallon.[13]

Federal Assistance

It should be noted that federal assistance in the form of loan guarantees, price guarantees and purchase agreements for alcohol fuels are currently in effect. A total of $1.5 billion has been appropriated for use over the next two years by the Department of Energy for biomass energy activities.[14] In addition, tax incentives are provided under the Crude Oil Windfall Profits Tax Act of 1980 for producers, blenders, marketers, and users of alcohol fuels. The National Energy Act motor fuel excise tax exemption on gasoline/alcohol blends is worth $0.04 per gallon of blend and $0.40 per gallon or $16.80 per barrel of alcohol in 10% blends. (A number of States also have exempted these blends from State excise taxes.) Alcohol fuels are also eligible for Department of Energy entitlements worth roughly $1.00 per barrel of ethanol or $0.02 to $0.03 cents per gallon. Loan guarantees for alcohol pilot plants, administered through the U.S. Department of Agriculture are also noteworthy. Finally, alcohol fuels facilities now qualify for the 20% investment tax credit enacted in Title III of the Energy Tax Act of 1978. The cumulative value of these Federal incentives and

of selected State incentives is truly impressive. Recently the Government has also given increased support through its research and development programs. The DOE's R and D funding relating to alcohol fuels has gone from $2.9 million in FY 1977 to $24.9 million in FY 1980. The U.S. Government has also taken steps to remove regulatory and institutional barriers to alcohol fuel development. Already in 1978 the DOE's Economic Regulatory Administration (ERA) adopted pricing regulations that encourage gasohol production by permitting the full cost of ethanol in gasohol to be passed through by retailers.

Given the incentives that are now being offered, combined with the growing interest (primarily in the farm belt) in ethanol fuel, it is necessary to consider different impacts which would be realized if increased production becomes a reality.

Environmental Impacts

All components of a gasohol "fuel-cycle": growing and harvesting the biomass feedstock, converting it to alcohol, and using the gasohol/alcohol blend in automobiles have significant environmental effect.[15]

Clearly the most significant environmental effects are the growing and harvesting of the ethanol feedstocks. A commitment to provide enough gasohol to supply most U.S. automobile requirements would involve putting approximately 30-70 million additional acres into intensive crop production.[16]

Assuming that the acreage is actually available, this new crop production will most certainly accelerate erosion and sedimentation, increase pesticide and chemical fertilizer use, replace unmanaged with managed ecosystems, and aggravate other environmental damages.[17]

Current soil erosion ranges between 2 and 3 billion tons of soil each year on American farms. These soil particles fill streams and rivers causing turbidity, filling lakes and reservoirs, obstructing irrigation canals and damaging or destroying aquatic habitats.[18] The concern here is that annual crops such as corn (the most widely discussed gasohol crop) are also among the greatest erosive crops. Increasing crop production for ethanol use is definitely going to have damaging results as far as soil erosion is concerned.

Another important issue is the heavy use of chemical fertilizers. Since high yields on these lands will be sought, additional use of certain fertilizers will cause runoff and leaching of nutrients to surface and groundwaters, causing premature aging of streams and nearly irrepairable damage to aquatic ecosystems. In addition, natural gas must be used to produce nitrogen fertilizers for the new crops. At current application rates, 50 million acres of corn production requires over 100 billion cubic feet of gas per year, or close to 2% of total U.S. natural gas production.[19]

There are alternative sources of feedstock that need to be investigated for their potential. For instance, forage grasses are known to cause pollution but could be expected to cause far lower levels of erosion than foodcrops.[20] Waste products and cellulose also have considerable applicability.

Cellulosic materials contain chemicals called polysaccharides, long chains of sugar-like molecules that can be broken apart by acids or enzymes to yield fermentable sugars that can be converted to ethanol. Cellulose conversion technology is still under development, but progressing. Alternatively, these materials—and other carbon and hydrogen containing materials such as peat and coal—can be converted to a mixture of carbon monoxide and hydrogen in a gasifier; this mixture can then be reacted over widely used catalysts to yield methanol. Since there are extremely large quantities of cellulosic materials and of coal in the U.S., by the late 1980's alcohol fuels need not use significant quantities of food product feedstocks.[21] New energy efficient ethanol plants will require about 50,000-70,000 BTU per gallon of ethanol produced to power the distilling, drying and other operations. Because New Source Performance Standards have not been formulated for industrial combustion facilities, the degree of control and subsequent emissions from new plants is not predictable. Here is an area that must be considered particularly given the fact that gasohol plants, private and public, continue to grow in size and number.

These are just a few of the more essential technical environmental effects that need to be discussed. There are also important political impacts that are linked to the production of ethanol which must be inspected if we are to have a complete picture of this new fuel supply.

Political Impacts

Perhaps the foremost political impact is the food vs. fuel competition for limited land resources and the subsequent ramifications for national and international food supplies. Lester Brown, of Worldwatch Institute believes that "the social and political ramifications of a massive production of energy crops will probably surface first in Brazil, the only country that is (currently) committed to running its entire fleet of cars on alcohol."[23] The problem which Brown sees is that

> Brazil has one of the world's most widely skewed income distribution patterns, with a ratio of 36 to 1 between the average income of the richest one-fifth of its population and that of the poorest one-fifth. A 1975 study showed that only one-third of all Brazilians were eating a sufficiently nourished diet. . .Evidence of malnutrition was found in the country's high infant mortality rate and in the fact that less than half the children under the age of 18 at the time had reached their normal weight for their age.[24]

The decision to turn to energy farms to fuel Brazil's rapidly growing fleet of autos is already driving food prices upward, thus leading to more severe malnutrition among the poorest segments of the population.[25] The immediate consequences of the Brazilian energy crops program may be more internal than external; however, the recently launched gasohol effort in the U.S. has much wider ramifications. If American croplands are shifted toward energy production in order to fuel automobiles on a massive scale, it will be at the expense of the exportable U.S. surplus grain. Over the past generation, the entire world has come to depend heavily on North American grain exports, with just over four-fifths of the total exports being from the U.S.

The agriculturally based alcohol fuel program designed to produce fuel for vehicle transportation in both Brazil and the United States threatens to divert food resources to nonfood uses and thus to raise food prices, thereby exacerbating the world hunger situation. However, a carefully designed alcohol fuel program that gave farmers first priority in the use of ethanol for tractors, farm trucks, and irrigation pumps, would help ensure future food supplies when oil supplies begin to dwindle.[26] This sort of emphasis would be a major step toward the creation of a sustainable food production system and hence a sustainable society.

Summary

The original attractiveness of agriculturally derived fuel must be balanced against the potential impact on the environment and more importantly on world food prices and supplies.

It seems the "stage is set for direct competition between the affluent minority who own the world's 315 million automobiles, and the poorest segments of humanity, for whom getting enough food to stay alive is already a struggle."[27] This scenario may in fact have already begun to unfold.

If human beings are called to be stewards of the land, then we must respond by considering the full implications of our action concerning ethanol fuel production. Can we realistically put a dollar figure on the value of human lives? What will the far reaching consequences be if we devote millions and perhaps billions of tons of our grain and previous farm acreage to the production of these fuel additives?

As Christians, we believe that persons are called to be good stewards, caring for all that the Creator has entrusted to us. Public policy on gasohol production is not simple. We must consider how our decisions as a nation will affect other nations of the world, particularly those in need of our grain for their very survival.

The other claim, looking into the distant future, is the state of U.S. agricultural resources. Long range planning has not been a notable characteristic of this democracy. Limits to growth are anathema to many Americans; they would prefer to talk about growth potentials through the magic of science and technology. But the oil is running out, and so is another of our precious resources—topsoil. It is truly time that the U.S. government consider not only justice in the projection of alcohol fuels but justice for the land, so that those who care for this most precious resource may know again what stewardship amounts to.

[1]*Congressional Quarterly*

[2]*Gasohol, A Technical Memorandum,* (U.S. Government Printing Office, Washington, D.C., 1979), p. 3.

[3]*Gasohol, A Technical Memorandum,* (U.S. Government Printing Office, Washington, D.C., 1979), p. 4.

[4]*Ibid.*

[5]In a letter to the Editor submitted by Commoner and Carlson to the *New York Times* on June 6, 1979; reprinted in hearing before the subcommittee on Agricultural Research and General Legislation July 23, 1979. (Washington: U.S. Printing Office, 1979). p. 126.

[6]*Ibid.*

[7]See C.S. Hopkinson and J.W. Day, Jr., "Net Energy Analysis of Alcohol Production from Sugar Cane", *Science* (January 18, 1980): V. 207. and R.S. chambers, *et. al.*, "Gasohol: Does it or Doesn't it Produce Positive Net Energy Results?" *Science* (November 16, 1979): V. 206.

[8]D.K. Piot, "U.S. Ethanol Plants Sprout Like Iowa Corn," *The Christian Science Monitor,* August 11, 1980, p. 2.

[9]"The Report of the Alcohol Fuels Policy Review," U.S. Department of Energy (Springfield, Va: National Technical Information Service, June 1979), p. 14.

[10]*Ibid.*

[11]All dollar figures quoted here are in 1978 dollars.

[12]*Gasohol: A Technical Memorandum,* Op. Cit., p. 20.

[13]*Ibid.*

[14]"Alcohol Fuels and the Energy Security Act" U.S. National Alcohol Fuels Commission, (Washington D.C.: U.S. Printing Office, August 1980), p. 16.

[15]*Gasohol: A Technical Memorandum,* Op. Cit., p. vii.

[16]*Ibid.*, p. 38.

[17]*Ibid.*

[18]

[19]*Ibid.*, p. 41.

[20]*Ibid.*, p. 12.

[21]

[22]*Ibid.*, p. 44.

[23]Lester R. Brown "Food or Fuel: New Competition for World's Cropland." (Washington: Worldwatch Institute, March 1980), p. 29.

[24]Brown quotes from the "World Bank Development Report 1979" (Washington, D.C.: 1979).

[25]Lester Brown, *Op. Cit.*, p. 29.

[26]*Ibid.*

[27]*Ibid.*, p. 6.

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Theodore R. Malloch

Research Associate
Association for Public Justice
Gordon College
Wenham, Massachusetts 01984

Towards a Theology of Church and Computer

The initial focus of this study was to investigate whether or not the local church should purchase a computer. The essential and underlying question of this investigation was whether a computer could enhance the ministry and functioning of the church, and if so, was its cost justified. In the beginning, this study was entirely devoid of theological implication. In fact, the question should the local church purchase a computer seemed straightforward: the church 1) should purchase a computer if it could perform meaningful tasks on a cost justified basis and 2) should not purchase a computer if it was either frivolous or not worth the investment. However, as with most issues or concerns related to the church, questions of theological relevance inadvertantly arise. Questions once simple become complex; easy solutions require additional thought.

Briefly, the focus of this report shifted from *should* the local church purchase a computer to the theological *necessity* for purchasing a computer. While this may seem initially as mere academic semantics, the difference in focus is quite real. The value of a computer for the church shifted from a mere information storage and retrieval system to a tool capable of not only enhanc-

ing the ministry and functioning, but as a vehicle in and of itself for communicating the "good news".

In 1977, Theodor Nelson wrote, "The United States—indeed the world—is about to be totally changed by a revolution. . .(a) computer revolution" (*The Home Computer Revolution*, 1977, p. 10). 1982 has arrived and the revolution has indeed begun. Computers directly and indirectly affect millions of people each moment. Computers can be found regulating the efficient burning of gasoline in Datsuns and Chryslers; monitoring the security of a home against fire and break-in; teaching deaf children to speak; monitoring cashflow and inventory for small businesses. Everywhere one looks, computers are being put to work. Perhaps the primacy of the computer in today's world is evidenced best by the fact that advertisements for computers can be heard on top 40 "rock stations," seen on "Monday Night Football," and given away on "Hollywood Squares." The computer has invaded—most people have been taken by surprise.

Perhaps the only invention that can rival the computer for restructuring life as it is known on planet Earth is the printing press. The printing press radically transformed the world view. The invention of movable printing changed drastically the *status quo* of society, societal interactions and most important the communicability of the Gospel. Directly attributed to the invention of the printing press was the demise of the feudal system. Learning, reading, knowledge, information of other places and people was no longer limited to an oral tradition or painstakingly slow written communication. Serf, peasant, lord, all became more exposed to ideas, new ideas, old ideas rephrased. The ability to exchange information rapidly and to a diversity of people is an accomplishment to which Christians are deeply indebted. The impetus and strength of the Reformation was directly related to the quick and broad dissemination of ideas espoused by Luther, Calvin and Zwingli. Like no other emancipator, the printing press unshackled the masses and decentralized power. Precious and sacred to Christian tradition is the ability of the masses to directly and individually study Scripture—in one's native language—a feat realistically improbable prior to movable type.

Not until the invention of the computer, and more specifically the small, home computer, has there been an invention to rival the printing press. The computer with its speed for handling information, its ability to process diverse information, and its flexibility for specific situations, will not only change the course of history, but will be instrumental in restructuring the interaction and communication between human beings.

You are not alone if the word "computer" conjures up an image of a large windowless room filled with huge metal cabinets and eratically spinning wheels of tape. While this may have once been an appropriate mental picture of a computer, it is no longer accurate. The most striking characteristic of the computer today is the variation in size, shape and form it exists in. The diversity of the computer is appropriately matched to the many tasks for which it is used. Computers exist everywhere; seemingly in almost everything: in traffic signals, washing machines, and children's toys. Computers stress-test airplane fuselages, mix drinks and produce full-length feature cartoons.

A computer can be most efficiently defined as a passive instrument, whose unique characteristic is the ability to follow exactly a precise set of instructions. The computer is basically a blank, "intelligenceless" device (a true *tabula rasa*). The plan, any plan a computer follows is not self-generated. It comes from outside the computer; it is called a program. The author of the program a computer executes is a human being. A human being puts together a finely detailed list of steps necessary for a particular function to be performed. The computer, on cue, executes these steps rapidly.

Since the computer is simply a passive device whose most salient feature is its ability to rapidly execute a function according to a specific plan, it is a tool lacking intrinsic purpose. Nelson (1977) writes:

> Just as a typewriter may be used for either commerce or art, to type sad words or happy words, a computer can follow lists which direct it to draw pictures, send out bills, or select the names of political enemies for dire treatment. It is not the nature of the computer to do any of these things. It is merely the nature of the computer to follow instructions. (p. 54)

Purpose for a computer is defined entirely by the user. The user creates a list and the computer follows this list. Because the computer is essentially an "all-purpose" machine, capable of being hooked-up to any electrical device, the number of functions an individual can program a computer to perform is practically infinite.

For the purpose of the local church, the word "computer" should create the image of a small series of components occupying less space than the top of a desk. These components technically make up a "computer system" although it is common to refer to this system as a "computer". The essential elements of a computer system for the church consist of:

> (1) a central processing unit (CPU), (2) a keyboard, (3) a screen, (4) external storage units (disk drives), and (5) a printer.

The revolution of the computer is not its suddenly being mass produced and affordable by large segments of the population (Apple Computer Corp. sold over $160 million worth of personal computers in 1979; as of September 1980, Radio Shack had sold more than 250,000 personal computers). The personal computer is revolutionary because it will reshape society and societal interaction. It will change the capabilities of human communication in style, form and quantity. The small home computer is a multidimensioned machine capable of communicating with the four month-old as well as the forty year-old. The computer has opened up new horizons. Things impossible to imagine or improbable to perform have been made possible with the advent of the small computer. Children can learn to write prior to having the motor skills necessary to coordinate a pen or pencil. A single letter can be sent to all 500 plus persons in Congress or 500 plus letters to a single person in Congress from 500 different individuals in mere moments of time (the actual time constraints are dependent upon non-computer equipment, like a printer). News around the world can be instantly available at one's finger tips without leaving one's home or office. Newsprint, hardback and softcover books, even the postal service may become obsolete, extinct, relics of bygone eras. There will be no need for printed material as it is known today.

The essential elements making the computer the powerful changing force in society presently are:

> (1) The immense quantities of information accessible (storable, retrievable) and the speed with which it is accessible.
>
> (2) The new medium for communicating this information is not written words, like books and magazines, but electrical impulses.
>
> (3) The demand for specificity.

Of the three, in many ways the demand for specificity is probably the most earthshaking. The computer is entirely a passive device. It is capable of producing only what it has been programmed to produce. If the means for accessing a particular program is a seven-

digit number, of which one digit is a blank space, and the blank space is omitted, the program is not accessed.

Specificity has existed for many years to some extent in the more rigorous scientific fields. Nowhere was this more evident than one day several years ago, when my good friend Ken and I decided to plant some corn. After momentarily glancing at the back of the box at the instructions, I immediately began planting. Ken on the other had, trained in the biological sciences, went and obtained a stick twelve inches long and made a mark two inches from one end. He proceeded to put a hole in the ground exactly two inches deep and twelve inches apart. In the meantime, while he had been reading the instructions and marking the stick, I had finished planting my three rows of corn. Three months later the results were obvious. There was no difference between my rows and Ken's; both patches produced equally. In other words, specificity did not matter than, but it does with the computer. Today, sporadic Stephen and methodical Ken, while equal in their planting corn skills, are widely disparate in their ability to program a computer. Why? Ken has learned the importance of being specific, exact.

Being exact is becoming a way of life not just for the sciences and the scientific, but for the general public. National and international relations have demanded common standards which allow for efficient trade and communication. Clarity and specificity are the hallmarks of these endeavors. The changing over to the metric system in the United States is one example of the push for common, clear and specific standards worldwide. The rise of consumerism is another. People want to know what they are purchasing, how much it will cost, how it compares to other similiar products, and when it will need to be replaced. The consumer of today can read from a grocery store shelf the exact unit price of a particular item (a can of corn) and compare it with another. The demand for specificity can be further observed in the increase of premarital contracts defining relational roles, private and community property, and what steps will be taken in the event of divorce. It is clearly evident that the need for specificity is not limited to interacting with computer. Specificity, exactness, precision, once relegated to rigorous science, is being implemented by society today.

The printing press not only restructured society and societal interaction, it changed the church, the people in the church. The computer, like the printing press, will change the church. The church reflects very sharply the people it embraces. The church of the middle ages figured very prominently in the development of the printing press. The Gutenberg Bible, famous as being the first book ever printed by movable type, exemplifies the involvement of the church with the printing press. The church of the middle ages changed. The printing press put Scripture and various other works in the hands of people. The church began educating on a larger scale people of all classes; teaching them to read and write. The Reformation, built upon the ability of people to read, espoused the notion Scripture could be read directly without interpretation: theology changed, people changed. The crucial fact is the church played a role in the development and use of the printing press. The church of today, stands in a similiar position to the church of the Middle Ages. The church has the potential to provide leadership and guidance in the application and use of such a powerful instrument. A machine that has no built-in purpose has the capability of great harm as it does great good. The computer can continue to be developed primarily by the military for military purposes, or it can be developed by the church for the service and ministry of Jesus Christ.

The church has a potential for becoming proficient in communicating to the people of the computer age. The people of this age are different. For many, an unintentional dualism is developing between the world of work (education) and the world of faith. It is not that these people lead dual lives in the sense one is evil and the other good, but dual in the sense one is precise, the other inexact. The dualism is one of communication; specificity. Those who have grown up in the church are generally more capable of straddling the fence between these two worlds. The church loses those who are foreign to the church. Every year, more and more people are brought into this world who will most likely never darken the doorway of a church. Statistics increasingly show church and formal religious experiences are becoming less common, more a phenomenon of the past. The domain society relegates to the church is becoming increasingly smaller. The church is losing its influence and its relatability. The tradition and heritage of the Reformation and the New Testament is the communication of the Gospel to all peoples. The use of the computer becomes a theological issue because the computer changes human interaction.

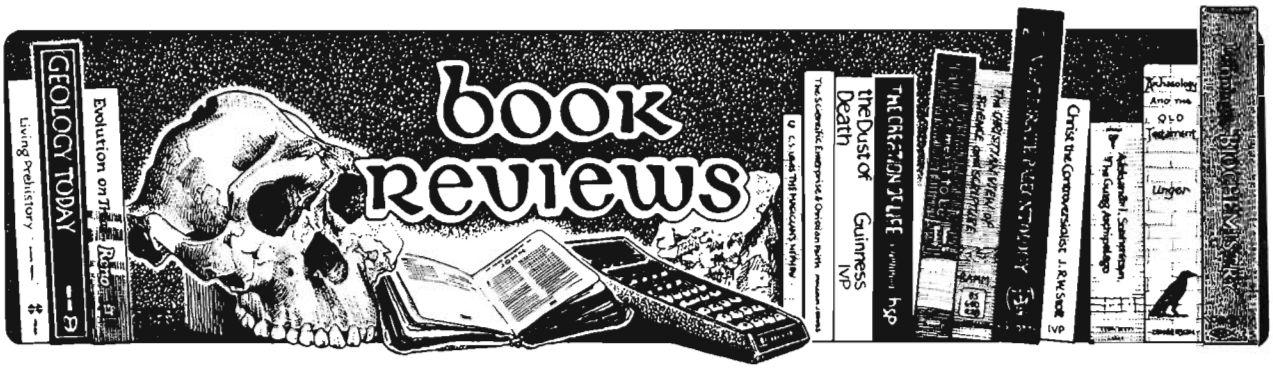
The church is not called to revolutionize the world of today or tomorrow. It is called to be faithful to the witness of Jesus Christ, with which it has been entrusted. The world around the church is changing. In order to maintain the relevance of the gospel the church must continue to change. The challenge is not whether the church will change, for it will, but whether it will be in the forefront as a force changing society.

Stephen R. Daniels
127 Grijalva Drive
San Francisco, California 94132

(Ed. note: This manuscript was printed by a computer.)

Apologies to Authors and Readers. . . .

We regret that authors' photos for this issue were lost in the mails and could not be replaced by the date of publication.



WHOLE PERSON MEDICINE: AN INTERNATIONAL SYMPOSIUM by David E. Allen, Lewis P. Bird, and Robert Herrman. Intervarsity Press, 1980, Downers Grove, Illinois 60515, $8.95, pages 261.

This is a most important and seminal work. It is the proceedings of a symposium held under joint sponsorship of Oral Roberts University which is of Pentecostal/Charismatic theology and the Christian Medical Society which is of evangelical theology and largely anticharismatic. From that point of cooperation between these factions within the Body of Christ the meeting itself (which I attended) and the book go downhill. This is not to belittle the book, for it is must reading for all health care Christians who did not attend the symposium itself since so many of us, probably the vast majority, live two lives: one in the world which includes the health related vocation and the other in the organized church which too much resembles the former except for terminology.

This meeting and its proceedings support the concept that there is an interface possible. Unfortunately, neither at the meeting nor in the book is there such a meeting. The Christianity is still religion in the traditional sense and *not* the way of life pervading every aspect of being which it *must* be to be real. And, fear not, for there is room to allow for widely disparate praxis.

The presentations have more humanistic, psychologized scriptural terminology than real scriptural insight, breadth or depth. However, there is excellent elucidation of the problem of the interface of religion and medicine, but no solution is presented—at least, none unique to Christianity.

There is only vague talk of whole personness as derived from Scripture. Indeed, there can be only vague talk when one leaves out the indwelling *power* of the Holy Spirit, which is supernatural from before the beginning and forever will be throughout eternity. Indeed, more recognition of counterfeit supernaturality is acknowledged than *true* supernaturality. There is *no* discussion of the Baptism of the Holy Ghost, essentially none of demons or deliverance, and almost none of supernatural healing.

Overall this book is comfortable enough for almost any secular (non-Christian) person, for they can merely change a word here and there and the comments fit Bahia, Islam, Mormons, Jehovah Witness, or any other of the numerous cults. There is almost no openness to the person and work of the Holy Spirit and thus no *power*.

Yes, the book is important and should be read, but for charismatics it is probably a waste of time and money.

Reviewed by Donald C. Thompson, R.Ph., M.D., A.B.F.P., 828 West Fourth North Street, Morristown, Tennessee, Private practice of Whole Person Medicine.

OUR FRAGILE BRAINS: A CHRISTIAN PERSPECTIVE ON BRAIN RESEARCH by D. Gareth Jones, Intervarsity Press, Downers Grove, Illinois 60515, $8.95, 1981, page 278.

My first introductory physiology textbook was British—the Winton and Bayliss text which at the time was quite small by today's standards. I learned then and have respected since the British as authors in general, especially for their easy reading style and the comprehensiveness of their writing matched by none in the world. That few American (or other) writers are capable of writing with such clarity of thought, simplicity and ease of communication and comprehension has continued to impress me since those early days of my professional education. I find Jones' book meets my best expectations. It contains few Briticisms that would make for difficult reading for the cultural American more used to the stilted styles of our works.

Jones has produced a work that *anyone* interested in brain development, retardation, the effects of nutrition and, especially, the consequences of physical damage to the brain with its subsequent personality changes and questions of the responsibility of the individual, will find interesting and useful. Less erudite but still very good are his discussions of drug use/abuse (licit and illicit) and the counterfeit "new age" movements from a Christian perspective.

This small book has a vast potential audience especially among health care personnel. Certainly even every physician will find areas that will inform and broaden his perspective because few of us have had the breadth of experience or training to make this book not worthwhile. Those not even in the health related professions will find this work virtually seminal for the Body of Christ, for practically all the discussion parallels Scripture—though it does not always explicitly say so; but, then, why should it?

The book is especially valuable in the perspective it puts on the problem of responsibility of the individual after brain damage, including a balanced approach to psychosurgery. There are few failings in the book and the only one of importance is that there is no discussion specifically about the person and work of the Holy Spirit.

Again, if you are or consider yourself a Christian—or, a non-Christian seeking the truth so that it might put things in proper perspective—this is one book that you should read.

Reviewed by Donald C. Thompson, R.Ph., M.D., A.B.F.P., 828 West Fourth North Street, Morristown, Tennessee, Private practice of Whole Person Medicine.

THE DEATH OF NATURE: WOMEN, ECOLOGY, AND THE SCIENTIFIC REVOLUTION, by Carolyn Merchant, San Francisco: Harper & Row, 1980. $16.95, xx + 348 pp., ISBN 0-06-250571-8.

Carolyn Merchant has written an intriguing analysis of the Scientific Revolution's impact on society's attitude toward women and nature. She believes that "women and nature have an age-old association—an affiliation that has persisted throughout culture, language, and history." The Scientific Revolution, in her opinion, led to the indiscriminate exploitation of nature and the growing perception of women as incapable of serious thinking or work. It ended "the image of the earth as a living organism and nurturing mother." New values emphasizing power, domination, self-interest, mechanics, and order took hold. For Merchant,

> The mechanist transformed the body of the world and its female soul, source of activity in the organic cosmos, into a corpuscular ether, purged individual spirits from nature, and transformed sympathies and antipathies into efficient causes.

To support her arguments Merchant displays a broad knowledge of philosophy, history, and science.

The author begins by surveying literature from the Old Testament and Classical periods that discuss the earth and nature as feminine. She analyzes the arguments ancient and medieval woodsmen and miners used to justify their interference with "mother earth." Merchant describes organic society as one of ecological balance, a balance which was undermined by the mechanistic society of the Scientific Revolution. In support of her argument she presents an excellent description of agricultural changes resulting from draining the fens and the indiscriminate use of raw materials by early industry.

In the Scientific Revolution "the image of nature. . .was that of a disorderly and chaotic realm to be subdued and controlled." This image affected the position of women, because "wild uncontrollable nature was associated with the female." As nature was debased, so were women. Nautre and women needed to be controlled to end disorder in science and society. An interesting example Merchant uses to show that work opportunities for women were increasingly limited to the home is the replacement of midwives in England by licensed male doctors who had training in the use of a new technical innovation, delivery by forceps. Advances in science and technology were used to limit women's freedom as well as to control nature. The intellectual change was also apparent in utopian literature which evolved from a stress on the organic unity of society (Andreä's *Christianopolis* and Campanella's *City of the Sun*) to a vision of society that was elitist and patriarchal (Bacon's *New Atlantis*).

Merchant cogently points out the many changes that occurred as the Scientific Revolution moved man's thinking from the organic to the mechanical. Many changes associated with the Scientific Revolution were destructive to man and nature; not all machines were used wisely, resulting in damaged ecosystems. Certainly social changes occurred simultaneously that weakened the position of women. Yet one comes away with the feeling that the weaknesses of organic society are negligible compared to those of the Scientific Revolution. Organic society, while preserving a better balance in the ecosystem, was filled with myth, superstition, violence, and insecurity. Its value system might preserve trees, yet sacrifice women and children to propitiate a god. Also in analyzing attitudes toward the new mechanical society, Merchant discusses the organic beliefs of several Protestants but not Martin Luther. Moreover, her discussion of Protestant influences on the organic-mechanistic transition are often cursory, which is especially surprising, since the Scientific Revolution is regarded by so many as a result of Reformation thinking. Nevertheless this is a well-written book whose arguments deserve serious thought.

Reviewed by Paul Kubricht, Department of History, LeTourneau College.

THE TWO HORIZONS: NEW TESTAMENT HERMENEUTICS AND PHILOSOPHICAL DESCRIPTION, by Anthony C. Thiselton, Grand Rapids, Michigan: Eerdmans, 1980, xx + 484 pp., cloth, $22.50.

In biblical hermeneutics, the science of interpreting the Bible, the term "horizon" is used metaphorically to

describe "the limits of thought dictated by a given viewpoint or perspective" (xix). When an interpreter approaches the text he does so from a perspective, or within an horizon, which has been established previously by his various intellectual, emotional and cultural circumstances. In the engagement between interpreter and text there is a second horizon which ought never to be neglected, namely, that of the text (more accurately, that of the writer of the text). A fundamental question in hermeneutics is: how can an interpreter engage in reading the text without drawing the horizon of the text to fit his own preestablished horizon? One of the chief aims of Thiselton's work is to show how the horizon of the biblical text, which is different from the interpreter's horizon, can enlarge and reshape the interpreter's horizon; briefly, how the Bible can be allowed to speak for itself.

To accomplish his task the author appeals to the work of Heidegger, Bultmann, Gadamer, and Wittgenstein. These four writers were chosen not because they all deal with biblical hermeneutics directly, but because each one in his own way employs a descriptive methodology in his philosophical work; and philosophical description *is* directly relevant to the fundamental problems in hermeneutics.

The general lesson to be learned from their descriptive writings is that one cannot justifiably ignore either of the two horizons in the work of interpretation. More specifically, we can see from the first three writers the importance of the existential element in reading the text; and from Gadamer in particular, the necessity of recognizing the interpreter's "pre-understanding". We must try to "avoid an understanding of the text which fits perfectly with our prior expections" (p. 304). Concerning the problem of how the Bible can be allowed to speak for itself, reshaping the horizon of the interpreter, the most important insights are to be found in Thiselton's application of Wittgenstein's ideas about the "logical grammar" of concepts, especially those ideas found in his later philosophy of language. It is difficult to overstate the significance of Thiselton's last two chapters.

The author identifies three classes of "grammatical utterance" and by using many New Testament examples shows how an understanding of these classes can aid in the hermeneutical task: (1) analytical utterances, which do not add to the original readers' stock of information but are used to clarify concepts already in their possession; (2) foundational utterances, which form "the scaffolding of thought" for biblical writers and are so axiomatic that they "lie apart from the route travelled by inquiry" (p. 395); (3) "linguistic recommendations which may or may not be based on institutional facts" (p. 402). Class (3) utterances can be found in Paul who quite often uses generally familiar terms in a new way to bring novel insights to his readers. The interpreter can gain access to these insights and realize the recommendational character of the "utterances" by discerning the peculiar logic of Paul's terms. The ever-present possibility of novel usage accounts for the fact that there is no essence of a concept.

To explain, there is no essence of a concept because (a) a word's meaning is established by its use, (b) its use is determined by linguistic convention (as made-up rules determine the moves of a game), and (c) conventions change, not only from time to time, but from context to context (etymology does not determine meaning); they even change within the writings of the same biblical author. In other words, concepts like "flesh," "truth," and "faith" are polymorphous or multiform in character. Thus, "the theologian must be guided by exegesis which takes full account of the logical particulars of each passage" (p. 415). If this is not grasped much New Testament theology will be confused and a great deal will be missed. "Meaning-from-use" is not simply a fact about some particular language, e.g., a biblical language, it is a fact about language universally; indeed, a fact about the very possibility of language formation. Thus, we must constantly ask, "how exactly is the writer using the term *here*?". And therein lies not only the possibility of, but the necessity for, letting the Bible speak for itself.

Thiselton writes with clarity and economy and despite the technicality of his work the reading goes very smoothly. *The Two Horizons* is an admirable book both in its breadth of coverage and depth of understanding. The attention to

Books Received and Available for Review

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

W.J. Abraham, *The Divine Inspiration of Holy Scripture* (Oxford)

S.B. Ferguson, *Know Your Christian Life* (InterVarsity)

C.F. Griffith, ed., *Christianity and Politics: Catholic and Protestant Perspectives* (1982)

B. Holloway, *Beyond Belief: The Christian Encounter with God* (Eerdmans)

J. Huggett, *Two Into One: Relating in Christian Marriage* (InterVarsity)

G. Mallone, *Furnace of Renewal: A Vision for the Church* (InterVarsity)

L. Morris, *Testaments of Love: A Study of Love in the Bible* (Eerdmans)

J.T. Murphree, *A Loving God and a Suffering World* (InterVarsity)

J.I. Packer, *God's Words: Studies of Key Bible Themes* (InterVarsity)

C.A. Raschke, *The Interruption of Eternity: Modern Gnosticism and the Origins of the New Religious Consciousness* (Nelson Hall)

R.F. Riggs, *The Apocalypse Unsealed* (Philosophical Library)

J. Wesley Robb, *The Reverent Skeptic: A Critical Inquiry into the Religion of Secular Humanism* (Philosophical Library)

R. Roy, *Experimenting with Truth: The Fusion of Religion with Technology, needed for Humanity's Survival* (Pergamon)

C. Salley and R. Behm, *What Color is Your God: Black Consciousness and Christian Faith* (InterVarsity)

K.E. Schemmer, *Between Faith and Tears: A Physician Tells How to Face Suffering and Win* (Thomas Nelson)

J.A. Shelly, *Dilemma: A Nurse's Guide for Making Ethical Decisions* (InterVarsity)

J.W. Sire, *Beginning with God: A Basic Introduction to the Christian Faith* (InterVarsity)

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

J.R. Tisdale, ed., *Growing Edges in the Psychology of Religion* (Nelson Hall)

C.P. Wagner, *Church Growth and the Whole Gospel* (Harper & Row)

P. Wilkes, ed., *Christianity Challenges the University* (InterVarsity)

detail and the respect for primary source material on every hand make it a model of Christian scholarship. This work deserves a large audience.

Reviewed by Gary Colwell, Waterloo, Ontario, Canada.

THEOLOGICAL SCIENCE by Thomas J. Torrance, Oxford University Press (1969), paperback (1978), 368 pp. $5.95

These Hewett Lectures (1959) were of particular interest to me as a theoretical physicist who wrote on "Scientist and Theologian?" (*Journal of Wash. Acad. Sc. 48*, 145 (1958)). The author is professor of Christian Dogmatics at the University of Edinburgh. His theological stance is that of a staunch Calvinist opposed to natural theology and secular theology—not to mention Bultmann. He regards theology as "concerned with statements that are pronounced primarily by God and only pronounced after Him by human subjects as hearers of the Word." He relies upon the "Holy Scriptures as the source of norm of all our theological statements."

This book is essentially a philosophical investigation of concern to theologians and philosophers of science. The author prefers to call it "a book about the philosophy of science of God." (To me theology itself is a philosophy of religion.)

The author's view of the scientific method in natural science is in the main acceptable. On the one hand, however, he is enthusiastic about Francis Bacon's "new method of induction" and, on the other hand, he is entranced by the role of mathematics in the "hypothetical deductive method." He does not appreciate the necessity of quantitative data for the latter and the importance of statistical physics. He overemphasizes the asking of questions without regard to their selection. The author seems to be obsessed with the need to be "scientific," a word which he uses *ad nauseam*. The theologian's method is certainly formally comparable with the scientist's if one substitutes revealed facts for observed facts. There is, however, a distinctive difference in the matter of verification, which does not warrant both being included under a generalized notion of science, which the author derives from his view of "true knowledge" *scientia* (Latin) and *Wissenschaften* (German). He defines the latter to be "rigorous, disciplined, methodical, and organized knowledge."

I have also some specific objections to his conception of natural science. "Exact sciences" are rarely considered to be such nowadays, and physics was never included among them. His speaking of primitive science, polytheistic science, and monotheistic science is not edifying. The author's adoption of A.C. Crombie's glorification of Grosseteste and William of Ockham as English "scientists" leaves much to be desired.

The distinctive feature of Torrance's theological science is that its object is God, who is inaccessible except insofar as He seeks us. Our "heard statements" then correspond to the observed statements of natural science. The author points out that there are actually different levels, such as the teaching of Jesus, Mark's teaching of the teaching of Jesus. The New Testament to be sure, does give us a portrait of Jesus, who is "the truth, the way, and the life." One ascertains the truth only by doing it (John 7:17). It's evident that this method is radically different from that of natural science. The author justifies their association by the popular notion that there are many scientific methods (I prefer to consider a single scientific method with various degrees of completeness). He actually goes further; he claims, "Theology is therefore more than a science. . .more rigorously scientific because of the total claim of its object (God), and its unconditional requirement of objectivity." Moreover, because "theology is concerned with God as creator of the world and therefore with God in his relation to the world of creaturely realities," it covers a broader range than the limited natural sciences—almost a "queen of the sciences." Inasmuch as "God in Jesus Christ is the Truth," his incarnation as a historical event cannot be treated like other historical events. Accordingly, the author discusses historical sciences; he insists that "theological thinking is historical thinking," but he fails to note the difficulty of isolating historical facts and ascertaining related historical factors.

It is probably not surprising that a physicist is not familiar with the language used in lectures given to three U.S. theological seminaries; the author aggravates the situation by inventing words, e.g., theologistic. What is worse, he introduces freely untranslated Greek and Latin words and phrases; for example, he compares *dandum* with *datum* and *lalia* with *logos*. He is inclined to cite argumentative references out of context. His addiction to mathamatical reasoning is exhibited in his introduction of so-called "theological algebra" and an analogue of four-dimensional space.

Reviewed by Raymond Seeger (NSF ret.) 4507 Wetherill Road, Bethesda, Maryland, 20016.

EARTHKEEPING: CHRISTIAN STEWARDSHIP OF NATURAL RESOURCES, edited by Loren Wilkinson. William B. Eerdmans Publishing Co., Grand Rapids. 317 pp. $10.95. 1980.

"The distinctiveness of this book is rather that we have approached the problem in an in-depth and integrated way from within the framework provided by biblical principles" is the claim of the preface of this comprehensive environmental study by the fellows of the Calvin Center for Christian Scholarship, Calvin College: Peter DeVos, Calvin DeWitt, Eugene Dykema, Vernon Ehlers, Derk Pereboom, Aileen Van Beilen and the editor, Loren Wilkinson, who has combined the six disparate writing styles into one.

In Section I on the "State of the Planet" is reviewed "some of the fragile features of the ecosphere" such as agro-ecosystems, the threat of urban expansion, the creatures under our care, the human tide, its basic food needs and growth, energy and mineral resources, including those of the sea bed, and how these resources relate to the rich and the poor, concluding that "the range of resources over which we are called to be stewards includes not only forests, flood plains, oceans, and ores, but also tariffs, technologies, legislatures, and corporations."

"The Earthlings" is the title of Section II, beginning with the historical roots to deal with the ideas of Lynn White, Plato, Aristotle, the Stoics and Epicureans, and medieval views such as those of St. Francis of Assisi. The scientific revolution, guided by the astronomers, Copernicus, Kepler, Galileo and Newton and continued by Descartes and Bacon, had its varied philosophies, such as "the use of knowledge of the world in order to have power over the world was the great theme of. . . . .Francis Bacon". The North American Experience, in spite of the romanticism of Emerson, Thoreau, and Muir, had its solution in using "most of nature intensively and even destructively, but to leave large tracts of land untouched as 'wilderness areas'." Our mind today is "freedom from impediments to the satisfaction of the individual desire" but a far cry from "the Christian ideal of freedom is freedom from impediments—and sin is an impediment—to being what God intended us to be."

The chapter on "Economics: Managing our Household" examines the historical views of economic reality from Plato and Aristotle to Calvin, then studies scarcity, resources, common property, how fast to use it up, and doubts about our economic system. In "the appropriateness of technology" it is stated, "the increasing power available to us through technology means that the consequences of our choices continually become greater." As a model, the earth is not so much a space ship (man made with limited resources), but a living thing which "does not encourage us to manipulate the earth as though it were entirely different from ourselves." We must preserve its resources. We are called to be Isaiahs, "our despair would be dispelled if we took more seriously our task as prophets."

"The Earth is the Lord's," is the title of Section III. Genesis 1 makes it clear that "the goodness of creation is a goodness in the things themselves, not in their usefulness to humans—who are not even mentioned until the end of the chapter." Things were named by Adam. "As far as we know, no other creature gives names to things. The task and the ability seem to be marks of what it means to be made in the image of God." After discussing man's dominion in the Old and New Testaments, the authors evaluate dominion in church history, stewardship resulting from the nature and composition of the human as well as the destiny of nature and humanity.

All should share in resource distribution, not only food itself but the *opportunity to obtain food* "When we speak of a 'just distribution' of the earths' resources, we cannot exclude other species."

The final section is "What Shall We do?" After analyzing common views of the earth, we read guidelines for Christian stewardship: all thirty of them. I want you to get this book, so let me tease you by quoting only one, Number 28. "Our aid to developing nations should work to encourage and enhance the cultural uniqueness of the nation and not to impose Western ideas on it."

There follows a fascinating account of what it can be like in the year 2025 if Christian stewardship prevails.

Delightful extras are a Steward's Hymn, clever cartoons from *American Scientist, Audubon, Christianity Today, Grand Rapids Press*, and *The New Yorker*, and also an appendix on what you can do.

Let's applaud the publisher for using recycled paper which looks as good as that of virgin materials. Do get this important volume.

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

BRAINS, MACHINES AND PERSONS, by Donald M. MacKay, London, Collins Publishers, 1980, 114 p.p.

Could an engineer build a computer that has consciousness? If so, would any Christian doctrines regarding the nature of man be invalidated? Is man merely a complex machine? If one can explain and predict an individual's behavior in mechanistic terms, is that individual then responsible for his/her decisions and actions?

Such questions are considered by the author in a way that both Christians and non-Christians should find satisfying in logical rigor. The author, who heads the Department of Communication and Neurosciences at the University of Keele, is a respected investigator in the fields of sensory physiology and communications. Many ASA members are likely familiar with MacKay's previous publications, of a sound apologetic nature, dealing with science and Christian faith.

Much of this book gives the reader an overview regarding the current state of research in brain physiology, computer science, and artificial intelligence. The author indicates how close the brain sciences may be (or not be) to fully explaining human behavior in a mechanistic sense. In addition the author gives a consideration as to just what computers and automata are and do and to whether these devices might have consciousness like a human individual. While these reviews are not as detailed as one would expect in a course textbook, the author provides readers outside these fields with a grasp of essential concepts.

The primary intent of the author is not as much to provide a textbook of the scientific advances in these fields as

to consider what these advances may imply about the nature of man—whether man is a mere mechanism, whether he is a responsible agent. A basic contention of the author is that the brain scientists' observations (such as nerve firings or neurotransmitter concentrations) are physical correlates of what we experience as conscious persons (feelings, thoughts, beliefs). The scientists' mechanistic description of brain function and behavior along with our conscious experience provide two views of the same events from different vantage points; the mechanistic level and the conscious level of explanation each has its own proper categories, emphases of meaning and reality. It is possible then to argue that, even if brain science were to develop a complete mechanistic explanation for human behavior, brain science would not have negated the usefulness and reality of what we experience in our consciousness. Christians thus need not feel that it is necessary to postulate the existence of any part of the brain, such as a soul or seat, which can operate without physical correlates. MacKay draws upon an analogy from computer science to argue on the other hand that, though there is no nonphysical part of the mind, one cannot rule out the notion of eternal life.

It is also a contention of the author that, no matter how far science may advance in providing mechanistic and deterministic explanations of human behavior, the reality of an individual's responsibility for his/her actions cannot be ruled out. The argument follows that of logical indeterminacy, which is presented in several earlier works of MacKay. I think, however, that this presentation is written in a way more clear to laymen.

With regards to advances in the field of artificial intelligence the Christian has nothing to fear. The author argues that if a computer with consciousness were developed, no essential biblical doctrine regarding the nature of man would be invalidated. The Scriptures are simply mute on the question of whether man can or cannot engineer other beings with consciousness.

Those who have read other works by MacKay will find many familiar terms and concepts—e.g. levels of viewing, I- and O- stories, complementarity, logical indeterminacy. While there is an overlap of this work with previous publications by the author, this book should be readable without prior initiation into MacKay's terminology. This book presents a logically based apologetic for refuting those who would contend that brain science and artificial intelligence have debunked man's spiritual nature and moral responsibility. Christians will appreciate MacKay's attention to truth revealed in Scripture. *Brains, Machines & Persons* is a worthwhile addition to a thinking Christian's library.

Reviewed by David A. Saunders, Ph.D., Assistant Professor of Zoology, Howard University, Washington, D.C. 20059.

THEOLOGY FOR THE 1980s, by John Carmody, The Westminister Press, Philadelphia, 1980. $9.50 (Paper), 192 pp.

In this book John Carmody, Adjunct Associate Professor of Religion at Wichita State University, attempts a short summary of the major theological trends of the last ten to twenty years. In less than two hundred pages the author does not try to be comprehensive but pragmatically selective. The outline of the book consists of a survey of five relevant categories: nature, society, self, God and Christology. Each of these categories become translated into an expedient issue: ecology, human rights, the life cycle, science and religion, sex and work, faith and secularization, feminism, distinctiveness of the historical Jesus, the resurrection. In each section Carmody concentrates on the ideas and writings of a few authors he judges to be most significant.

The strength of the book is its comprehensive character without being too technical. In a single volume of comparative length I could not expect more. It was most helpful to me in directing me to further readings on particular topics. The book does not intend to be predictive or creative but readable and over-arching. I also appreciated the author's efforts to lift up issues which bring us to the heart of the Gospel.

Any one of us approaching the same task would undoubtedly select other areas for consideration. As a result Carmody does not touch upon biblical criticism, Christian education, pastoral counseling, the mission of the church, family life styles, worship and preaching, sociological trends, American black theology, etc. I understand the author's predicament in this regard, but can we discuss the future without considering issues of scriptural authority, church divisions, and our understanding of what it means to be the church of Jesus Christ? In a very short final chapter, "Theology for the 1980s," Carmody asks us to recognize the important leadership role of black theology and the necessity to rethink the whole economic basis of our culture. I agree completely and therefore missed a solid section on these two crucial areas. On the other hand, Carmody should be commended for his sensitivity to the need to develop a contemporary mysticism, the ecological question, and theological implications revolving around Christology.

I am certain each reader might also have included a different choice of books which aim at giving an overview of a particular area of study. Personally I would have mentioned *Modern European Thought: Continuity and Change in Ideas, 1600-1950* by Franklin L. Baumer in the section on history and culture; *Soul Friend* by Kenneth Leech in the practice of Christian spirituality; and *Meaning and Method: Prolegomena to a Scientific Philosophy of Religion and a Scientific Theology* by Anders Nygren in the study of science and religion.

The author demonstrated that he was well acquainted with many of the leading Roman Catholic thinkers. I especially appreciated his strong emphasis on a "feminist

reflection of God" and those who have made important contributions. Disappointing, however, was the almost total omission of important evangelical theologians. I found it almost inexcusable that when Carmody deals with systematic studies he does not mention Carl F. H. Henry (3 vols.), Donald G. Bloesch (2 vols.), Helmut Thielicke (2 vols.), or G. C. Berkouwer.

In general I think most readers will find this book useful if they are looking for a book that provides a broad perspective that is not too technical or creative. If you are feeling out of touch with contemporary theological trends and studies, this is a good place to start.

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

PATTERNS IN HISTORY: A CHRISTIAN VIEW, by D.W. Bebbington, InterVaristy Press, 1979, xi + 211 pp., $7.25.

"The purpose of this book is to analyze historical thought." (p. ix) Bebbington categorizes such thought into five schools: cyclical, Christian, progress, historicist and Marxist. He gives a detailed review of each.

The cyclical view sees history as a revolving wheel in one of three variations: restricted to particular dynasties or civilizations, applied to the whole earth or universe, or concentrated on decline from a primitive golden age. No fully articulated cyclical view is popular in the western world although it has been influential.

The Judaeo-Christian view incorporates the notions that God intervenes in history, that history is linear, and that it moves toward a divinely-ordained conclusion. This eschatological dimension leads to hope for the future, and is a very important aspect. However, while providential intervention by God in history is important to this approach, it is difficult to recognize in particular cases.

The progress view that grew out of the Enlightenment reduces providence to simple cause and effect. It is characterized by a belief in continuing improvement through history, and a high view of the future. Unfortunately, while there is obvious material progress, moral progress cannot be discerned.

Historicism is a development of German thought of the last century and a half. The basic notion is that each culture is the product of a group's history. Thus each age is deemed to have its own intrinsic worth and a relativism results. A major difficulty here is that the continuity of human nature is not accounted for.

Marxism is a materialist conception of history. It is not ideas, but rather material conditions that shape history; of particular importance is the way in which men supply their needs. This does not satisfactorily account for great art, ideas and selfless motivation that is often evident in man's endeavours.

After reviewing these five schools, the author considers the dichotomy between the positivism of the progress school, and the idealism of the historicist school, both of which are seen as deviations from the Christian position. The former concentrates on the regularities of history and the latter on autonomy. Underlying this dichotomy is another: determinism and free will. Bebbington suggests that the way to deal with this is to start with the Christian estimate of human beings: a seemingly insignificant part of creation yet at the same time unique as created in the image of God. The book ends with a call to Christian historians to illuminate the ways of God in history and bring the message of hope and mankind.

This book has three principal values. First, the analysis of the five schools of thought, their principal advocates, and their weaknesses is a readable summary of a great deal of material. Second, the discussion of the tension between idealism and positivism, and the proposal for recognizing the merits of both is a helpful synthesis. Third, the work can serve as a model for other Christians who seek to apply similar analyses in their own fields. Bebbington says: "As a general rule, the more cogent the argument, the greater the historian." This book is a cogent argument for a Christian view of history.

Reviewed by David T. Barnard, Assistant Professor, Department of Computing and Information Science, Queen's University, Kingston, Ontario, Canada.

PORNOGRAPHY: A CHRISTIAN CRITIQUE, by John H. Court, InterVarsity Press (1980), 96 pp., $2.95.

Nowhere today do Christianity and culture clash more than in the area of the social sciences. Thus we applaud psychologist Court's useful introduction to the widespread problem of pornography.

In an opening chapter, Court outlines eight serious arguments which defend pornography. They range from the scientific-medical to the philosophical to the political. Succeeding chapters critique each argument, pointing out weaknesses and inconsistencies, often utilizing results from the latest research in the field.

Given this format, the book could easily have degenerated into an exercise in propaganda. It does not. Court is not interested in knocking over straw men. Thus he allows that soft-core pornography may be useful in treating certain psycho-sexual problems. He is also aware that one's civil liberties ought not be casually abridged in a pluralistic society. Moreover, he consistently refuses to mistake the erotic for the pornographic—which would condemn much

good art (including Paradise Lost). Indeed, one of the central features of the book is to progressively make clear what pornography actually is: a dehumanizing, mechanical, atrophied thing—the crutch of emotional cripples.

The concluding chapter outlines strategies for combatting pornography. These include production of a positive "literature of love," and a call for Christians to live their values by being concerned for their neighbor.

This is a timely, reasonable, and readable introduction to a problem that affects everyone in every community. I recommend it.

Reviewed by Louis K. Combs III, 11 River Terr. Ct. #106, Minneapolis, Minnesota, 55414.

BITTER HARVEST by Frederic and Sandra Halbert. Grand Rapids, Michigan: William B. Eerdmans Publishing Co., 1978, 159 pp., $4.95.

If you would like to read a true story of a scientific search that reads like a novel, you should get this book by a couple managing a dairy farm near Battle Creek, Michigan where a hundred thousand dollar loss in milk production in a short period of time was caused by some mysterious ingredient in the cattle food, as yet unidentified at the beginning of this narrative. You will admire the courage and persistence of Rick as he follows every lead until the contaminant is identified; you will have a surge of sympathy for Rick and Sandra as the last of a herd of four hundred are forced down an alleyway to their final destruction.

Rick had left a "successful position as an engineer at the Dow Chemical complex in Midland" to begin managing the farm with his father. He had received a master's degree in chemical engineering from Michigan State University. One day Rick said to his wife, "We've lost hundreds of pounds of milk in a few days and I can't figure why the cows won't eat." and from that time on he watched the symptoms increase. Tears flowing from cattle eyes, but no pink eye, no noticeable fever, no chewing of cud: the veterinarian ruled out IBR, the cattle would not touch the parlor feed, the Farm Bureau's #402. Rick suspected that some contaminant had gotten into it. The story continues for a hundred pages like a detective novel as tests are made, as Rick is frustrated with the bureaucracy in his attempts to discover the toxin and the final success when WARF, the Wisconsin Research Facility, discovered that the material is bromine, in polybrominated biphenyl, PBB, a fire retardant, "What apparently happened was that Michigan Chemical sent the wrong stuff to the farm bureau and the fire retardant was added to our feed in place of mag oxide."

In Michigan "23,671 cattle, 4,621 swine, 1399 sheep, 656 chickens, 2 goats, 32 rabbits and 6 horses" were buried. Much cheese, butter, dry eggs and milk were destroyed along with 865 tons of feed.

But you will also feel for the effects on family life as tempers occasionally become ragged, sleep is lost, favorite pets are sacrificed, and children meet frustrations. Damage suits come to trial nearly four years after the accidental mixing and every one of the states 9000 dairy farms was tested. At the worst, animals were quarantined, "their products declared unsalable, and worst of all, having their barns, fields and pastures declared unfit for animal husbandry or crop production."

But to get the real fascination from this splendidly written account, you must read it for yourself. Listen to the conclusion. "It will be years before all the questions are answered. Until then all we can do is wait and hope that we have contained this disaster, that someone will come up with a way to rid the human body of this chemical, that we are not victims of our own technology."

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

THE WHEEL AND THE CROSS: A CHRISTIAN RESPONSE TO THE TECHNOLOGICAL REVOLUTION by Waldo Beach, John Knox Press, Atlanta, 1979, 126 pp., $4.95.

Beach attempts with reasonable success to contrast the cross, a symbol of Christianity, with the wheel, a symbol of technology. The book may also be read as an attack on scientism, which Beach characterizes as a religion. He not only calls it one, but outlines scientism's epistemology, metaphysics, anthropology, soteriology, and eschatology. He says, correctly, that scientism, with its gospel of efficiency through technique, has invaded the church, and, more in our time, with perhaps more impact than the reverse invasion. The book is not, however, an attack on technology as such.

Beach attempts not only to chastise scientism, but to prescribe for Christians. Like most such attempts, his prescriptions are controversial, but, says Beach, that shouldn't be a deterrent, as decisions at the cutting edge of morality are bound to be debatable. The church needs to be leading by examining, not waiting for unanimity.

Beach is a good writer, often producing arresting sentences. ("The decline in English literacy in SAT scores is less alarming than the decline in the moral literacy of responsibility." (p. 101)) He has done a generally good job of dealing with technology and its implications. Although not as deep as books like those of Ellul, *The Wheel and the Cross* deserves reading and discussion by Christians. I would recommend it, for example, for college and high school libraries, and it might have a niche as a discussion guide for elective Sunday School classes.

Reviewed by Martin LaBar, Central Wesleyan College, Central, South Carolina 29630.

CRY JUSTICE! THE BIBLE ON HUNGER AND POVERTY edited by Ronald J. Sider, Paulist Press and Intervarsity Press, 1980, 220 pp., $2.45.

Most Christians have already read much of this book, since it consists primarily of passages from Scripture. But Ron Sider, as editor, has arranged these passages to highlight God's concern for the poor, the hungry, and the oppressed, and to demonstrate God's expectation that we act to alleviate the suffering of the poor.

For the most part, the Scriptures are allowed to speak for themselves. Passages are organized under topics such as "God's People and the Poor," "Is God Fair?", "Obedience and Abundance," and "God Wills Justice." The passages, from the lively Today's English Version, are occasionally interrupted by tables illustrating world economic inequality. For instance, the reader who sees in a table that the average U.S. per capita cereal consumption is over four times that of developing countries may find the verse from Ezekiel on the opposite page particularly relevant: "(Sodom) and her daughters were proud because they had plenty to eat and lived in peace and quiet, but they did not take care of the poor and underprivileged."

The best part of this book is its set of study questions in the back. Sider promises that the questions are all tough and weighty, and he keeps his promise. Following a reference to James 5:1-5, he says, "This text also says that the rich become rich by oppression. Does this teaching . . . have any application to the low wages paid to third world persons who, for example, pick our coffee and bananas?" After a reference to Psalm 128:1-4, he asks, "Why does God reward obedience with material abundance? Does he always do that?" My wife and I used these questions in a class on living more simply that we taught at our church, and they definitely stimulate discussion.

For the reader who is convinced that he or she should do something about hunger but is not sure what, an application for joining the organization Bread for the World is conveniently supplied on the inside back cover.

Reviewed by Raymond N. Greenwell, Department of Mathematics, Albion College, Albion, Michigan 49224.

CHRISTIANS ORGANIZING FOR POLITICAL SERVICE by James W. Skillen, Washington, D.C., Association for Public Justice Education Fund (1980), 113 pp., $3.50.

The first three chapters of this essay-study guide for Christian political action should be on every Christian's must read list. The author, an Associate Professor of Political Science and research director of the Association for Public Justice Education Fund, raises questions that go to the fundamental basis for Christian involvement in the political process. One is tempted to quote long passages from the book to ensure that even those who are not motivated to read the book will be provoked to consider the important issues that Skillen addresses.

The author initially recognizes that Christians "have sometimes been among the most self-interested, biased, racist and self-righteous groups in America." Skillen then points out that there is very often little to distinguish Christians from non-Christians in public life today. "Politically speaking conservative Christians have more in common with conservatives who are not Christians than they do with politically liberal or socialist Christians." This state of affairs leads Skillen to question whether Christians have been so saturated with humanism that they no longer have anything uniquely Christian to offer.

The answer for anyone who accepts the *Bible* as God's direction to his people as a way to conduct their relationships as well as a road to salvation must be that yes, Christians do have a unique and priceless knowledge to bring to the political process. Certainly, if God intended His word to be a guidebook it must be sufficiently clear and specific to provide real guidance. Why then are Christians not united? Skillen does not tell us why Christians are not politically united. He does, however, suggest that the unique contribution of Christians to the political process should be to promote "public justice" as the norm for life in the public community.

"Public justice" is an abstraction to which all might adhere; however, without concise definition which Skillen does not provide, it leads us no closer to a unifying concept for Christians to politics. More helpful is the analysis of Dr. Zylstra which examines man's inalienable rights in the context of man's relationship to a creator God. Thus Zylstra suggests that foremost among these rights is the right of each man to respond to and fulfill his calling from God. Zylstra's approach provides a useful starting point for anyone seeking to define "public justice." True Christian political unity can be achieved only after a careful and prayerful study of Scripture. Books like this one should provoke thoughtful Christian political theorists to reexamine political philosophy in light of God's direction to man.

Skillen's book is more important for the questions raised than the answers provided. The final four chapters which describe the activities of the Association for Public Justice and offer suggestions for those desiring to enter the political fray can be skipped without loss. The only important statement Skillen makes regarding the practical aspects of the Christian's participation in political life is that we should undertake each act in the recognition that our actions are not God's will, but only our fallible response to God's will. The first three chapters of this book deserve a wide readership.

Reviewed by David C. Hjelmfelt, lawyer, 634 S. Mason, Fort Collins, Colorado 80524.

SCRIPTURE TWISTING: 20 WAYS THE CULTS MISREAD THE BIBLE, by James W. Sire. InterVarsity Press. 1980. 180 pp. $4.95

Do you know people who squeeze strange meanings out of ordinary passages of Scripture? Who think the Bible validates cults as readily as orthodoxy? Who are being pulled by persuasive text-spouters? Here at last is a book to help counter much nonsense proclaimed as biblical truth. It is a book that I, as both pastor and professor, have been hoping for for a long time.

As in Sire's other books (such as *The Universe Next Door*), the text is eminently readable, with clear and brief subsections. His points are aptly illustrated by specific references to doctrines of sects and cults popular today, including the Unification Church (Moonies), Jehovah's Witnesses, Mormons, TM, Christian Science, and more.

Sire begins with precise definitions of key terms and a statement of the purpose and limits of the book. While the book explains 20 "Misreadings" of Scripture, it is really an exercise in logic—a refreshing thing to see in an evangelical paperback—that instructs the reader in how to read literature in a way that respects the text and the world-view in which it was written.

Beginning with obvious errors, such as inaccurate quotation and ignoring context, Sire moves on to more subtle and thus more dangerous twistings, such as the figurative fallacy, ignoring alternative explanations, and virtue by association. Perhaps the most useful section for us who teach at a collegiate level, is the last section, world-view confusion, where it becomes apparent that many cults are simply trying to squash the Bible into a non-biblical metaphysics.

The most challenging section for orthodox readers, however, lies in Sire's demand that we, too, come to Scripture with a truly open mind, laying our concepts of Jesus and Scripture on the altar of the Word, so that we, too, may grow in the light that may yet spring forth from God's Word.

The book ends with a useful appendix in which each of the twenty misreadings are summarized. The book is well documented, and includes both a general index and a Scripture index.

I wish every thinking seeker after truth would take this book to heart.

Reviewed by James Walter Gustafson, Professor of Philosophy, Northern Essex Community College, Haverhill, Massachusetts

LIVING WITH UNFULFILLED DESIRES, by Walter Trobisch, Inter Varsity Press, Downers Grove, Illinois, 1979; 130 pp, $3.50.

The Trobisches, Walter and Ingrid, answer eighteen letters from questioning, hurting, and confused teenagers growing up in a world that is moving too fast. Finding the resources available to them were not offering clear guidance, they turn to "Dear Mr. Trobisch." His advice is biblically sound and compassionate, treating the letter writers as though they were his own children (they had five), and members of his church (he was a pastor).

Conjure up a teenage problem and Walter most likely has touched on it in this thin volume. The most frequent are daydreaming, petting, sex, masturbation, boy friends, girl friends, and lack of love from parents. He guides his correspondents into growing experiences, ultimately learning how to live a fulfilled life in spite of many unfulfilled desires.

Walter observes in the introduction, in the epilogue, and many times in between that the families and parents do not offer these teenagers the security, love and guidance they need during their transition years to adulthood. Several of the eighteen writers find strength and support in Christian faith and fellowship; still there are questions that need answering. They can't be turned loose at 16.

A few quotations may communicate Walter's gentle but firm style and encourage you to read the book. "What you should try out before marriage is whether you fit together in your hearts, inwardly, and this takes a lot of time—more than four and a half months." "I would like to warn you and urge you not to take the pill. At your age, it can certainly cause great damage." "You have also learned that too much kissing can make you numb.—A kiss is like money. It loses value if there's too much of it around." "This is why the longing (for a boy friend)—this good and precious longing—has to remain a longing at least for the time being. You have to learn to live with unfulfilled desires. This is the difficult art of your time of life."

Campus Life magazine calls this book one of the best 4 or 5 of the year. I agree and endorse it for teenagers *and* their parents.

Reviewed by Robert Carlstrom, (father of four) Columbia, Maryland.

Letters

Impressed by Articles on "Creation"

I was recently introduced to the *Journal ASA* and some of your excellent articles. I was especially impressed by the two-part article on "Creation" which appeared in Volume 32, Numbers 1 and 3, (1980). You have put so succinctly the arguments I have been using for years. You, though, express them so much better.

Would it be possible to get copies of this two-part article and any or all of the others in the series, "Science and the Whole Person," starting in 1976? I would be grateful to be able to add them to my library.

Anton L. Inderbitzen
Office of Scientific Ocean Drilling
National Science Foundation
Washington, D.C. 20550

Thanks for a Broader Perspective

I appreciate very much that you printed the letters from D. M. D'Aria and Tom Pittman in the December 1981 issue of the *Journal ASA*.

I have been reading the magazine for quite a while and believe they are the first such sentiments I have seen. Instead, what I have been seeing is exactly what Tom Pittman said in his first paragraph. This is probably the result of viewing things from my own perspective, but I don't see that that is any worse than for others to view things from their perspective.

I believe it is true that by far the most articles in the *Journal ASA* are from the academic community. It should be rather sobering that this same issue has the article by Jerry Bergman which says that it was the academic community more than the religious community that would not at first accept the heliocentric view of the universe, "because the new theory was so radically different from the view of the universe which had been accepted for hundreds of years." I wonder if that may be the situation with creation/evolution. The Christian academic, scientific and theological communities have worked so hard and so long to try to reconcile evolution and Scripture that now it is hard to give it up.

I am certainly no expert on this, but it is my understanding that Einstein's theory of relativity came about, at least partly, as a result of working to reconcile the new idea that the speed of light was independent of the speed or direction of its source. So it seems to me that it is a worthy objective to try to fit our world view into the biblical statements just the way they are written, excepting, of course, what may be plainly allegorical. And that decision as to what is allegorical and what is not, may be just where some of the difficulty lies.

I have the privilege of reading your magazine before sending it on to my missionary son, David Newquist, Ph. D. (atmospheric science), physics professor at Tunghai University, Box 365, Taichung 400, Taiwan. We serve as his Stateside mailing address.

Wayne E. Newquist
1220 W. 22nd Street
Kearney, Nebraska 68847

Author Responds to Critic

D. M. D'Aria has criticized my paper "Apparent Age and its Reception in the 19th Century" (*Journal ASA* Sept. 1980), characterizing it as a "misconstrued analysis" (Letters, *Journal ASA* Dec. 1981). Meaningful criticism is always welcome, but how accurate are his/her charges? I respond as follows:

D'Aria claims that "Krause ignores completely" differences in the use of apparent age by Gosse and more recent creationists. In fact, even though my paper is historical and not comparative, I commented at length on precisely these differences, summarizing with the statement, "Thus, apparent age as used by present day "creationists" does not correspond to its consistent use by Gosse, . . ." (note 34). I cannot see how I could possibly have been more explicit, yet D'Aria somehow has managed to miss this. D'Aria also feels that I do not recognize that the recent creationist version of apparent age is of a softer, less radical nature than that of Gosse, stating "they certainly do not fly off to the extremes of Goose." In fact, I specifically commented on this also, and further pointed out that in his interpretation of astronomical data Morris has utilized apparent age in a manner *more* extreme than any, to my knowledge, ever used by Gosse himself. (note 27, also discussed further in my Communication, JASA Dec. 1981). D'Aria charges that I find it "laudable" to criticize Gosse as "simple-minded." In fact, nowhere do I make such a judgment of Gosse. D'Aria charges me in addition with "suggesting that Genesis should not be taken too literally." Again, nowhere do I make such a suggestion. Evidently D'Aria both has not completely read the paper he/she criticizes and has failed to understand that the primary purpose of a historical study is *not* to prescribe what should have happened but rather is to describe and illuminate what in fact *did* happen. It remains to be seen whether this episode of the 19th century and the response it elicited has any relevance for us today.

David J. Krause
Science Division
Henry Ford Community College
Dearborn, Michigan 48128

135 Years Later

The early American Congregationalist pastor Edward Hitchcock (1793-1864) was also the president of Amherst College and a first rate geologist who sought to harmonize Genesis with his science. He wrote several books of interest to ASA members; it was customary for him to handle the difficult questions of science/theology issues with skill and candor. His *Elementary Geology*, which went through several editions as a standard nineteenth century textbook, devotes several pages to a discussion of the age of the earth. The following is lifted from pp. 292f of the eighth (1847) edition:

"Some maintain that the fossiliferous rocks were deposited by the deluge of Noah.

Refutation. 1. That deluge must have been for the most part violent and tumultuous in its action on the globe: for the ocean must have flowed over the land in strong currents; and when it retired, urged on as it was by a wind, similar currents must have prevailed. But a large proportion of the rocks were evidently deposited in quiet waters. 2. If deposited by that deluge, the materials and entombed organic remains of the rocks ought to be confused and mingled together; whereas in both these respects they are actually arranged with great regularity into groups. 3. The period occupied by the Noachian deluge was vastly too short for the disposition of rocks seven miles in thickness, and with a great number of entire and distinct changes in their nature and organic contents. 4. The organic remains in the rocks do not correspond to the animals and plants now living on the globe. But this deluge took place since the creation of the present races; and, therefore, by this hypothesis, they ought to be found in the rocks. Hence they were deposited before that event.

Rem [ark]. An apology is due to the geological reader, for introducing a formal refutation of an hypothesis, which, to him, appears so entirely absurd. The apology consists in the fact, that many intelligent men are still found maintaining this hypothesis."

Sad to say, they still are.

E. B. Davis
4540 Gifford Rd., #16-G
Bloomington, Indiana 47401

Tentative Conclusions Based on Questionable Sources

In the abstract to his "The Establishment of a Heliocentric View of the Universe" (*Journal ASA*, Dec. 1981) Jerry Bergman promises an analysis "researched using both primary and secondary sources." However, the result seems instead to be a rather tentative collection of statements and conclusions virtually all of which are based on secondary and tertiary sources at best and a number of which are questionable. (Where was Copernicus a professor of astronomy? What, if any, "observations of the heavens caused him to accept a heliocentric view. . .?" If "the scientists strongly believed that the Copernican theory was ludicrous," what shall we call Copernicus, Kepler, Galileo, and their supporters? Roger Bacon lived 300 years *before* Galileo.)

Bergman is certainly correct in seeing this episode as something more than a simple Church-science confrontation, but surely he goes too far in his attempt to minimize the implications of Galileo's trial. For example, how can Bergman's conclusion that "The interference of the Church in his work was actually minor. . .," and particularly that he afterward "lived his life researching and writing about his theories." be reconciled with Galileo's formula of abjuration, which required him to "with sincere heart and unfeigned faith. . .abjure, curse, and detest the aforesaid errors and heresies. . .and swear that in the future I will never again say or assert, verbally or in writing, anything that might furnish occasion for a similar suspicion regarding me;", his later observation, "nor can I go forth to defend myself, there having been issued an express order to all Inquisitors that they should not allow any of my works to be reprinted which had been printed many years ago or grant permission to any new work that I would print. . .so that it is left to me only to succumb in silence under the flood of attacks. . .," and his complaint, after the manuscript of his *Discourses* has been taken from Italy and published in Holland, that "I have not been able to obtain a single copy?" (All quotes from Santillana, one of Bergman's sources).

In my opinion, a much more coherent analysis and interpretation of this episode will be found in an earlier *Journal ASA* paper, T. H. Leith's "Galileo and the Church: Tensions with a Message for Today" (Mar. through Dec. 1973).

David J. Krause
Science Division
Henry Ford Community College
Dearborn, Michigan 48128

I have now read rather carefully Jerry Bergman's article in the December 1981 *Journal ASA*. I find it a rather weak article because (a) it is based primarily upon older secondary sources, and (b) the conclusion stated both in the abstract and in the large type on p. 229, is essentially unsupported by the main text of the article, and rests on some rather select quotations in the short concluding section. The paper thus conveys the impression that the conclusion was established in advance and the story line added subsequently.

Several rather minor errors might have been prevented, such as the misspelling of Wittenberg or the statement that Schönberg urged Galileo to disseminate his research, rather difficult since the Cardinal died in 1537.

Owen Gingerich
Center for Astrophysics
Harvard College Observatory
Smithsonian Astrophysical Observatory
Cambridge, Massachusetts 02138

Competitiveness and the "True Sin of Sodom"

I must compliment you and ASA on the consistently high quality of the *Journal ASA*. Your always balanced treatment of controversy (abortion, nuclear power, etc.) and your tolerance of ambiguity rather than certainty really deserve the warmest commendation. This is true even though I probably tend to track with that part of the Christian community that leans to the prophetic (rather than the priestly), with those who are against religious (and secular) *institutionalism* (Jesus rather than Peter?).

In your December '81 issue, there is a strange connection which can be drawn between Flynn's outstanding article on competition and Christian ethics, and McCauley's article on sexual abuse. The gross abuse of the competitive "instinct" in American culture, and the heretical attempt to link this abuse to a Christian root was well documented but perhaps understated by Flynn. It is an old doctrine that Christians are "reborn into a community" whose welfare along with the welfare of the poor, starving and lonely, must take precedence over self-advancement. The Dominican, Sebastian Moore, has put the proper reason for Christian's striving for excellence in a poetic expression: Christians, he writes, may strive "to be somebody for somebody." Flynn, in his fine critique of American sports competitiveness did not mention the much

older Western tradition as I was taught it in a British public school: "It matters not whether you win or lose, but how you played the game."

This ludicrous, sinful, culture-destroying competitiveness (the "Number One" syndrome) in America, even with respect to nuclear war will literally achieve that self-destruction soon, unless headed off by dramatic acts by dedicated Christians and others. It has led directly to the Reagan Administration's economics: "Survival of the fittest" economic Darwinism in absolute and direct contravention of biblical concern for the poor. Yet it has been supported by many who abhor biological Darwinism.

Now for the connection between the articles. McCauley's article on incest shows a misreading of the Bible's views on sex that is primitive. Nowhere in the Bible does it say that the sin of Sodom has something to do with male homosexuality. The reference to Gen. 19:5 refers vaguely only to what some of its citizens wanted to do in a visit to the big city. Elsewhere the Bible explicitly and unambiguously tells us what the sin of Sodom is, but 99.9% of the Bible-quoters are so personnally obsessed with sexual "sins" which their Lord never bothered even to mention during his entire ministry (e.g., homosexuality, pre-marital intercourse, abortion, polygamy, etc.), that they ignore the sin He clearly focussed on (neglect of poor, hurting, helpless). The sin of Sodom is in Ezekiel 16:49: "This was your sister Sodom's crime—pride, fulness of bread, and abundance of idleness was in her and her daughter, neither did she strengthen the hand of the poor and needy. And they were haughty. . . ."

Flynn has rightly connected American competitiveness with an economic life style and ethos which in at least one manifestation leads directly to the glorification of Sodomy.

Now a passing word on "incest." The undifferentiated use of this term to include say, totally coercive, physically pain-inflicting, parent-child sexual acts on the one hand, and the totally consenting (even legalized in Pharaonic marriage) sexual congress among adult brothers and sisters is pitifully naive. What the data from history and present studies are showing is that it is *coercion* which is morally wrong and psychologically damaging. "Sexual acts between consenting adults" is not intrinsically (unless other issues are involved such as lying or cheating) of sufficient importance to even have gained Jesus' attention. It is a fifth order effect on the moral fiber of the country compared to the first order effect of neglect of the poor (worldwide), the vicious hate-mongering now in process against the Soviets, etc.

The irony of McCauley's own "Conclusions" was lost on him. "The moral standards (*sic*) that help form the foundation of our Christian faith are crumbling before our very eyes. . . . Are we in fact quickly approaching the situation that Lot escaped in Genesis 19?" Escaped indeed! By fleeing Sodom which committed the sin of piling up riches while ignoring the poor, Lot escapes to commit incest twice!! (Gen. 19:33, ff)

My Christian (not Jewish) faith has the moral standards I find Jesus stressing, and by which I fail miserably: Loving others, even enemies (professional, USSR, etc.), concern for justice (in Nicaragua and El Salvador where Christian priests and nuns, thank God, fight against the U.S. government's excesses), sharing my worldly goods (tithing is a miserable cop-out), feeding hungry, housing homeless, etc. I thank God for the remnants of Christians and Jews and others who via their committed lives are shoring up *these* moral standards, the only ones the New Testament explicitly and unambiguously says really count.

Rustum Roy
Director, Materials Research Laboratory
Chairman, Science, Technology & Society Program
The Pennsylvania State University
University Park, Pennsylvania 16802

Example of Evangelical Excess

In Bergman's article, "The Genetic Basis of Homosexuality," *Journal ASA*, September 1981, we find an example of the lengths to which supposedly scholarly evangelical enterprises will go to fight against a biological basis for homosexuality. As is evident from his first sentence, Bergman fears such basis may leave no room for further rejection and oppression—but world history proves him wrong. He is an education teacher and his essay—he conducted no empirical research—is published by an *evangelical* organization, no matter what the organization's name may imply. He clutters the article with quotations from Pentecostal preachers, an Episcopal bishop, public opinion polls, popular periodicals, and some psychoanalytic material from the 30s, 40s and 50s. Misunderstanding the non-experimental nature of the old Bieber report, he claims foolishly that Bieber "demolished the long-standing belief that homosexuality was biological." The Bieber report, based as it is on some psychoanalysts' impressions about their patients in the 50s, could not have concluded *anything* about biology, much less "demolish" biological possibilities.

A glaring deficiency is Bergman's failure even to mention, much less to interact with, the many more recent findings of researchers supporting biological connections and sexual orientation etiology (e.g., the work of Dörner; Margolese; Ward; Goy and Resko; Parsons; Meyer-Bahlburg; Maccoby and Jacklin; Pillard, Rose and Sherwood; to name a few)—though this is not to say that their research is at all conclusive. (Dörner, for example, has demonstrated an interesting "neuroendocrine predisposition for homosexuality" in adults with normal testosterone production based on events at a critical period of differentiation in intrauterine development.) Does Bergman know that sperm banks refuse to accept gay men as donors because the physicians say it is still unclear whether homosexuality can be inherited?

Bergman's most fundamental failure, however, is that he does not seem to understand that whatever the complex of interacting influences for the etiology of homosexuality may eventually prove to be, the *final* pathway is biological. It is the brain.

Ralph Blair
Editor, *Review*, a Quarterly of Evangelicals Concerned, Inc.
30 East 60th Street
New York, New York 10022
Reprinted from Winter 1982 issue of "Review."

No Male Rights?

In reading the article on "Abortion" (*Journal ASA*, September 1981) I could find no evidence of a consideration for male rights.

The woman has a very biologic bond/claim to her child. As they say, possession is 9/10 of the law. She could leave and have the child on her own or abort. The male is not regarded after conception. He is dependent completely on her after conception as to whether the child is born.

The woman, being relatively dependent during pregnancy and

child rearing, will however, contract with the male for protection and support. The male provider in return has claim to the children in part. It is the only way he can have his own children—contractual law.

If the woman receives 100% legal right for decisions as to whether she brings a pregnancy to term, two people lose out—the fetus and the father.

Steve Billingsley
Rt. 202/206
Bedminster, New Jersey 07921

(Readers of the article mentioned will find the statement, "In many cases a false approach to abortion decisions may occur if all of the options are not explored. . . In husband-and-wife situations, or even in the case of an unmarried couple, the perspective of the father should be included in the total decision making process.")

Well-Informed but Without Wisdom

I was extremely disappointed to read the article on abortion in the September 1981 issue of *Journal ASA*, and I would like to address specifically some of the statements in the hope that this letter will be read with the same sincerity in which it is written.

The article begins in a manner which demonstrates both concern and enlightenment, but even in the opening paragraph there are signals which warn that Bube does not fully comprehend his subject. Forgive me if that sounds harsh, for clearly he is well-informed, but his knowledge is without wisdom.

The statement is made, "Like many other issues of this type, the abortion issue calls for a neither/nor approach to ethics that excludes extreme positions and enables us to deal with a real and imperfect world in a meaningful and compassionate way." First of all, there simply are no "other issues of this type." While there are numerous issues which deserve our emotional as well as our political involvement, abortion, by its very nature, stands as a category of its own.

A "neither/nor position" is an irrational phrase which is impossible to put into practice. Can the law reasonably be ambivalent toward slavery, murder, child abuse, rape, or any other crime? There are many of us for whom abortion is absolutely synonymous with killing babies. The only difference is the age of the children in question. To ask us to take "a neither/nor approach to ethics" is to ask us to abandon all sense of morality. The implication that only such a middle ground approach is "meaningful and compassionate" strikes a nerve in those of us who care for both the mother and the child with every ounce of our being.

In the sixth paragraph Bube draws a rather inappropriate conclusion: if ". . . once a human life has been started. . .any attempt to terminate this development is tantamount to destruction of a human life," then it is logical to conclude "that efforts at birth control by any means might well be suspect." Such logic is entirely false. There is no comparison whatsoever between preventing a life from beginning and terminating its development once it has begun.

The comment is made that Bube is ". . . considering possible grounds for granting an abortion to someone who desires it, not grounds for forcing abortion upon someone who chooses not to request it." Certainly the thought of forced abortion is intolerable, but no more intolerable than the thought that a mother who "desires it" may be granted the right to end the life of her child no matter what the "grounds." That sort of reasoning could be equally applied to any law which seeks to impose the morality of one group onto another (as all laws do). If, for example, it is against my principles to abuse my child, I will thank you not to force me to do so. But if I know for a fact that my next door neighbor is beating his children, do I have any right (or obligation) to ask the law to intervene? Would it not be easier not to get involved? And if his children should die from his abuse, should that concern me if he never forces me to beat my own children?

The list of indications for abortion deserves attention:

1. *Non-psychiatric medical risk of a pregnancy to the woman.*
This is not really an argument in favor of abortion at all. When a woman is pregnant, there are always two patients, two lives to be considered—that of the mother and that of the child. It is the responsibility of the doctor to save life, not to end it. In the rare case where the mother's life is actually threatened by the pregancy, removing the child from the womb is an act of saving her life. In most cases it is not a matter of choosing the mother over the baby, but choosing life for one or death for both. If the child is young enough, he will probably die from this operation, since he cannot survive outside his natural environment, but the *Purpose* of the operation is to save life, not to destroy.

In the even more unusual case where there really is a choice between the mother's life and that of the child, the decision rests with the physician, family, and the mother. Most would probably choose to let the mother live, but it is exactly the same moral decision as the one faced by the captain of a sinking ship in determining who will get into the lifeboats. The decision is an extremely difficult one, but it has nothing whatever to do with the "humanness" of any individual.

2. *Threats to the mental health or psychiatric condition of the woman.*
There are two problems with this argument.
a. The terms "mental health" and "psychiatric condition" are so vague that they are practically without meaning. Unfortunately this excuse for abortion has become a catch all in which all sorts of abortions have been justified.
b. The second problem is stated clearly within the article itself: "this time the dilemma does not pit human life against human life, but the *life* of the fetus against the *personal wholeness* of the mother." "Personal wholeness" is another vague and immeasurable term. How can we even begin to weigh one person's well being against another person's very right to exist? The natural extension of this argument has already led to the wholesale slaughter of the unborn; what is to prevent it from going beyond that? Bube states that "a third human life is involved." His reasoning suggests that if another human being threatens our well being, it is our right to destroy that other life. Can such destruction ever improve our well being?

3. *Abnormality of the fetus.*
We have just come through 1981, "The Year of the Disabled," yet we continue to cheapen the value of human life by saying that if a person does not measure up to our standards of wholeness or perfection, then that person does not have the same values as a "normal" human being. I *know* that all of us want our children to

be able bodied and of sound mind, but we have no more right to kill our handicapped children before they are born than we do after they have been with us for twenty years.

4. *Rape.*

a. Studies have shown that pregnancy resulting from rape is extremely rare. It is so rare, in fact, that it is practically non-existent. This argument is usually used as an exception clause, but has more than once led to further liberalization of abortion laws.

b. If a woman is treated medically shortly after she's been raped [and this is standard operating procedure], it is possible to prevent fertilization. This is *not* an abortion.

c. Since this does happen, even though it is unlikely, we cannot ignore the one-in-a-thousand rape victim who does become pregnant. But how do we best offer her our support? Certainly not by inviting her to do violence to another individual. Violence done to one person is never compensated for by violence done to another. That mother is in a very undesirable circumstance, but we should encourage her to look upon her child as an innocent party in the crime that has taken place. Her own humanity has been violated and she needs our support, not our quick solutions.

5. *Incest.*

Do they really "need to be delivered from the *consequences* of their environment?" That may solve an immediate embarrassment, but it will accomplish nothing. These girls need desperately to be delivered from their *environment*!

6. *Population control.*

I can't even believe this was said. The argument is abominable.

7. *Eugenic control.*

I cannot understand the statement that this need not have the negative image of association with Hitler's plans' for a super race. How does it differ? Perhaps it differs in motive, since he wanted his super race to rule the world and we merely wish to avoid the inconvenience of having to care for the non-productive members of society. We may even say altruistically that we wish to spare them a life of misery. But aren't we still judging them to be less valuable than we?

The distinction between "wholly human" and "fully human" is nonsensical. By this reasoning, it would be lawful to kill anyone, since *all* of us are in the process of becoming. And if coming to faith in Christ is the criterion for being fully human, then we may treat as only potentially human those who do not yet know Him; and we may assume that if we do know Him we can stop growing, for we have now fulfilled our human potential.

Bube's solidification of the abstract concept of "personhood" is very convenient for his argument, but it cannot change the abstract nature of the idea he is trying to relate. A statement such as, "It is . . . appropriate to view early abortion as the ending of human life, but not as the ending of personal life" smacks of "pure science" ideologies in which the individual is irrelevant.

On the bottom of page 164 Bube begins the sentence, "If spontaneous abortion (miscarriage) can be consistently viewed as the will of God, it would seem that induced abortion in the early stages of pregnancy can also be viewed as the will of God expressed through human agents." Have we forgotten that natural death occurs at every age? How could we possibly reason that since many people die at age 16 (or 60 or 86), it would therefore be an expression of God's will for us to "terminate" others of the same age?

If justice were in force no one would yet have legalized aborting babies, since no one has yet proven that they are not human beings ("wholly," "fully," or otherwise). And the burden of proof lies with those who would pass such judgment. For if there is any reasonable doubt, must we not give these children the benefit of that doubt? I truly believe that the evidence in favor of the children will overwhelm you.

The two questions which Bube feels dominate the issue really avoid it altogether. Rather, we should be asking ourselves: (1) Is an unborn baby a human being? [and if we cannot be absolutely sure of the answer, what is our obligation?] (2) Are there any circumstances which justify the un-provoked killing of fellow human beings?

There is no magical distinction between the first trimester and the third. There is only an aging process begun at the moment of conception and continuous until the moment of death.

Bonnie J. Mansell
807 S. Catalina Ave., #3
Redondo Beach, California 90277

Response by the author:

I fear that in her zeal for the sanctity of human life, a concern with which I most heartily agree, Mansell has read into this article problems that are not there, and has failed to read out of the article those statements upholding the sanctity of human life. The article clearly states, for example, that abortion at any stage should not be granted at the whim of any person, even the mother, that the rights of the woman "over her own body" terminate when she voluntarily enters into intercourse, that fetal personhood must be defended against arbitrary abortion, and that reasons such as not being wanted cannot be taken as automatic sanctions for abortion. I will try to respond briefly to a few specific items in Mansell's letter.

The claim that "there simply are no other issues of this type" perhaps betrays the limited vision that characterizes the criticisms made. As a matter of fact the issues that arise in euthanasia, in vitro *fertilization, research on fertilized human ova, and various facets of genetic engineering are exactly the same kinds of issue as abortion. In each the sanctity of human life needs to be both defined and defended.*

A "neither/nor" position properly understood is hardly irrational, and is, in fact, most moderate. It specifies that we avoid both the absolute dictum of abortion under any condition on the one hand, and abortion under no conditions on the other hand.

Part of Mansell's difficulty is defined by her own statement, "There are many of us for whom abortion is absolutely synonymous with killing babies." I grant the historic accuracy of the statement, but that does not necessarily guarantee its ethical correctness. Mansell obscures the issues involved consistently throughout her letter by referring to fetuses, regardless of age or stage of development, as "babies," "children," "human beings," and "persons." But it is precisely the suitability of the application of these labels as more than emotional and psychological stimuli that is under question.

As stated above, I explicitly eliminate as acceptable the right of a mother "who desires it" to end the life of her conceptus "no matter what the grounds." To argue that I favor this position is not to read the article objectively.

The "abominable" argument relating to the use of abortion for

population control is not even hinted at in the article. Instead under this heading I report what is indeed the fact in the world today and point out that the use of abortion for population control is highly undesirable.

Mansell's categorical rejection of the distinction between "wholly human" and "fully human" as nonsensical can be attributed only to her lack of understanding of what these terms are trying to express. This is not surprising since space was not taken in the article on abortion to work this out, a previous article having been devoted to this subject. Needless to say, none of the implications suggested by Mansell is valid.

Mansell may desire to dismiss the statement, "It is. . .appropriate to view early abortion as the ending of human life, but not as the ending of personal life," because it smacks of reductionistic scientific ideology to her, but the definition of "person" cannot be so easily dispensed with. Within the context I have developed in which any abortion is a tragedy, not to recognize the correlation between the development of biological structure and personal life is to close one's eyes to the reality of the created universe in which we live.

If we are to maintain that genetically human material not possessing the biological apparatus required for the most elementary expression and experience of consciousness is nevertheless equivalent to a human person, we make travesty of the meaning of words and attempt to treat the world that is as if it were some other world of our own invention.

In spite of our disagreements, I am thankful there are people in the world who care as much as does Mansell about these issues. I hope only that her caring does not in some cases lead to more suffering and inhumanity to human persons than she is seeking to avoid.

Eliminate the Tube

The *Journal ASA*, September 1980 issue contained a book review of Jerry Mander's *Four Arguments for the Elimination of Television*. Having since read this book, I must write a few comments that the reviewer failed to make.

Jerry Mander's book is important because it is an attempt to show that all technological development is not acceptable, and that in fact some technology should be eliminated. While David A. Kloosterman of The Upjohn Co. has difficulty accepting Mander's arguments, I do not. Kloosterman wrote of Mander,

"Jerry Mander gerrymanders his research so as to include any and all data which support his preconceived notions and exclude all data which do not. Towards anti-television data he is completely without skepticism: science, pseudo-science, pop-psychology, science-fiction, Eastern mysticism, Indian religious beliefs, and personal experiences all are equally acceptable as data sources insofar as they coincide with his ideas."

In the light of Kloosterman's professional affiliation and religious confessional position, Mander's argument is no more "pre-conceived." Mander's use of religious information, so-called pseudo-science, and personal experience have an important place in his argument because his is an argument that encompasses his experience as an advertiser, as well as the religious impact of television. While Mander's underlying apologetics for animistic religion is distracting, I believe that Christians can learn much from his book. His is an excellent humanistic critique of idolatry and the political manifestations of our communications technology. His warnings about "how we turn into our images" is a clear contemporary recognition of the biblical warnings against idolatry. The admonitions of the prophets against overflowing ourselves with information not about God hang in my mind as I read Mander's political argument.

While Mander gives Christianity a bad rap, it is only because Christianity's perspective on biology, chemistry and physics has been overwhelmed by a nature/grace dualism. If he was shown what the Bible says about stewardship, he might very well give his profession of faith. The point is, Mander attempts to provide a broad argument against television because all of his empirical data and his religious presuppositions tell him it is wrong. As a Christian, my presuppositions also tell me that we should also call for the elimination of the Tube. It is time that we see that the command of the Bible to "love" has political, economic and technological ramifications. We must recognize that God's command to "have no other gods before me" also includes science. We must be conformed to the image of His Son (Rom. 8:29), not the sun.

Rick Hawksley
Graduate Student, Architecture
Kent State University
Kent, Ohio 44242

Founded in 1941 out of a concern for the relationship between science and Christian faith, the **American Scientific Affiliation** is an association of men and women who have made a personal commitment of themselves and their lives to Jesus Christ as Lord and Savior, and who have made a personal commitment of themselves and their lives to a scientific description of the world. The purpose of the Affiliation is to explore any and every area relating Christian faith and science. The *Journal ASA* is one of the means by which the results of such exploration are made known for the benefit and criticism of the Christian community and of the scientific community.

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ROBERT L. HERRMANN, P.O. Box J, Ipswich, Massachusetts 01938.

ASSISTANT EXECUTIVE DIRECTOR:
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EDITOR, AMERICAN SCIENTIFIC AFFILIATION NEWS:
WALTER R. HEARN, 762 Arlington Ave., Berkeley, California 94707.

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