The influence of critical thinking on Christians belief and belief change with reference to the polarities of creationism and organic evolution
by Margaret Gray Towne

A thesis submitted in partial fulfillment of the requirements for the degree of Doctor of Education
Montana State University
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Abstract:
This research centered on the factors which inform the basis for belief and belief change among Christians relating to the subjects of creationism and organic evolution and particularly whether critical thinking was employed when beliefs were established or changed. Both quantitative and qualitative data were collected from 261 participants representing four different populations of Christians in northcentral Montana. Data were gathered from questionnaires, in-depth interviews, and the Watson-Glaser Critical Thinking Appraisal.

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A lack of understanding between belief in creationism and the Christian doctrine of creation was noted. Factors which contributed to or prevented belief and belief change were identified and related to belief formation and modification throughout the vicissitudes of life.

Recommendations include more acculturation in critical thinking throughout the lifespan and within all realms of life, including the sacred, and improved science education to prepare individuals for a complex and scientifically dominated world. More thorough instruction by the church on the varied literary forms of the Scriptures and the diverse means by which they can and should be interpreted may alleviate misunderstanding. Means by which evolutionary theory may be integrated into a Christian belief system are included as are suggestions aiding those who disseminate critical thinking skills or assist in belief change.
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MONTANA STATE UNIVERSITY
Bozeman, Montana
April 1995
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APPROVAL

of a thesis submitted by

Margaret Gray Towne

This thesis has been read by each member of the graduate committee and has been found to be satisfactory regarding content, English usage, format, citations, bibliographic style, and consistency, and is ready for submission to the College of Graduate Studies.

Date Chairperson, Graduate Committee

4/17/95

Approved for the Major Department

Date Head, Major Department

4/17/95

Approved for the College of Graduate Studies

Date Graduate Dean

5/2/95
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Signature: Margaret J. Terne
Date: 16 April 1995
This paper is dedicated to my father, David McFarlane Gray, who first introduced me to the Scriptures, encouraged curiosity, modeled the joy of learning and, where appropriate, had the courage and honesty to change.
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CHAPTER 1

INTRODUCTION

Background

A gulf has existed between the worlds of science and religion in the Western world for most of the 20th century, with each side ignoring, distrusting, or even holding the other in contempt. "Scientists distrust theologians dabbling in science, just as theologians distrust scientists barging into theology" (Dobzhansky, 1967, p. 114). "When a scientist writes about God, his colleagues assume he is either over the hill or going bonkers" (Jastrow, 1992, p. 9). On the other hand, Peacocke states, "A theology that marries the science of today may well be a widow tomorrow" (cited in Mangum, 1989, p. 11). At the very least, there has been suspicion, misunderstanding, and ambivalence between the two disciplines. "The warfare between science and theology is often a struggle to clarify to what extent causal explanations are compatible with or antagonistic to meaning explanations" (Mooney, 1991, p. 319). In recent decades this conflict has erupted in the classrooms and courtrooms of our nation.

The core of the debate between science and religion according to Lepkowski (1984) is that scientists believe "religion skews objective reasoning,
fuels repressive movements, and stifles freedom of thought" (p. 36) and that religionists insist "that science pursued from an agnostic or atheistic base feeds the growing materialism, narcissism, and violence of the current age" (p. 36).

Scientists are not always trained to wrestle with the questions of ethics, philosophy, and the relationship of their data to society. Their commitment to the scientific method can estrange them from matters of faith, transcendence, and the world of religion. Theologians, in turn, are trained more humanistically and some find the mindset and language of science to be somewhat foreign. They tend to be wary of the required belief reorientation and subsequent inevitable societal and institutional transformations which are demanded by the growing body of data which has been empirically derived.

This phenomenon is peculiar to the past one hundred or more years. Prior to the middle of the 19th century, most scientists of the Western world were outspoken and committed in their Judeo-Christian faith. In fact, in many instances, faith was the motivation behind their research. It was expected that science would provide new and convincing evidence for the reality of God (Pannenberg, 1992, p. 300). Newton once wrote that nothing could "rejoice" him more than his science should be used for the purpose of demonstrating the existence of a deity (Wertheim, 1994, p. 38).

The historian of science must be well aware that it is often the branches of science which seem to have the greatest theological impact that are most rapidly developed (astronomy at all times, geology in the late 19th century, physics in the 20th century). Pascal, Descartes, Newton, Leibniz, Darwin, Pasteur, Kelvin, Lyell, Einstein,
Schrodinger, Heisenberg, Eddington, and Jeans were all involved in theology as well as science. (Jastrow, 1992, p. 119)

Their scientific inquiries were seen as religious quests.

There is strong support for the thesis that science arose as a consequence of Judeo-Christian theology that viewed God as Creator and Supreme Ruler of nature, one who had not only brought the cosmos into being, but governed it by laws that reflected his faithfulness and consistency. The pioneers of science thus embarked on an unprecedented period of exploration with the attitude that God had given them a world to be understood and appreciated through science in much the way that theologians understood and appreciated God through the study of the Scriptures. This reverential attitude is seen in Francis Bacon, Isaac Newton, Clerk Maxwell, and the vast majority of their contemporaries. In this century it was profoundly the experience of Albert Einstein, of naturalist Louis Agassiz, and of physicist Werner Helsenberg. It is also the experience of neurophysiologist Sir John Eccles, and of astronomers Alan Sandage and Owen Gingerich. (Templeton & Herrmann, 1989, p. 7)

In England in the 1660s, the Charter for the Royal Society directed its Fellows in physics, chemistry, and biology "to pursue their studies 'to the glory of God the Creator and to the advantage of the human race'" (Poole, 1990a, p. 71).

What happened during this century which has resulted in the divisions between scientists and theologians?

The change came about as a result of a shift in the philosophy used by scientists, a shift toward antisupernaturalism. The idea of direct acts of creation was rejected in favor of an explanation of origins from a naturalistic point of view using only the laws of chemistry and physics. Nothing supernatural was involved in the new explanation. This trend was also accompanied by a general decline in "religious" faith. (Chittick, 1978, p. 19)

Moore (1983) assesses the problem as "a serious conflict in patterns of thought and belief. It is a conflict between those who espouse analyzing problems
by using data and logic and those who espouse traditional, and often supernatural, beliefs handed down from our forefathers" (p. 96). Some see it as a conflict of heart and mind and an irreconcilable dilemma because the two groups hold opposing world views.

Barbour (1993) suggests this conflict comes from the two extreme world views, scientific materialism and biblical literalism, which reside at opposite ends of the theological spectrum. He believes that each represents a misuse of science, both failing to observe its proper boundaries. "The scientific materialist starts from science but ends by making broad philosophical claims. The biblical literalist moves from theology to make claims about scientific matters" (p. 7). Barbour further states, with respect to evolutionary theory:

Creationists have raised valid objections when evolutionary naturalists have promoted atheistic philosophies as if they were part of science. Both sides err in assuming that evolutionary theory is inherently atheistic, and they thereby perpetuate the false dilemma of having to choose between science and religion. (p. 12)

Science attempts to explain the "how" of existence while the biblical authors seem more interested in the "why" and the "who." To understand the whole story, both disciplines are essential.

The 20th century has experienced an explosion of scientific discovery, and as phenomena which heretofore were attributed to God were explained rationally, some people have experienced an erosion in their faith. Lightning is now understood using the principles of electricity. The Germ Theory of Disease explains many illnesses, and former beliefs that attributed disease to having been
sent from God or the gods have been abandoned. It is now established that many diseases are prevented not by prayer or by living an exemplary life but by avoiding infectious microbes or getting vaccinated. To the faithful, prayer will always be important in the prevention and cure of disease, but it is now also understood that other factors such as cleanliness, good nutrition, and certain avoidance behaviors can play crucial roles in the presence or absence of illness. God can still intervene, but natural laws are operating and must be acknowledged and respected.

During pre-scientific ages humankind was greatly oppressed by a sense of helplessness in the presence of the vast forces of nature. Armed now with the knowledge of science, humans are no longer subject to the caprice of nature and superstition. Most farmers do not hold elaborate ceremonies to pray for rain or an abundant harvest as their ancestors did. They prepare the ground, select the best seed, irrigate and fertilize, all based on sound scientific principles. Before the dawn of modern science, nature was regarded as a realm of perpetual miracle, controlled by gods or God. Science replaced this view with one of natural laws which result in an orderly universe. To many, God is no longer needed to explain the universe (Munk, 1954, pp. 65-67).

The phenomenon of using a supernatural God to explain what is unexplainable is called "the God of the gaps." These "gaps" are areas of scientific ignorance or phenomena which cannot be understood by scientific reasoning. "Believers often take comfort by arguing that if science cannot explain why certain things happen, then God's actions may be inserted to fill the gap" (Huchingson,
Bube (1993) points out the weakness of this position in that any gap is vulnerable to scientific advance, and the obvious consequence is a retreating and weakening God (pp. 131-140).

An overview of the influential events in the history of the relationship between Western Christianity and science is included in Appendix A.

**The Need for Interchange**

While science has explained much, there remain questions for which science cannot provide answers. Astronomers have proven that the creation of the universe is the result of forces beyond the reach of scientific inquiry (Jastrow, 1992, pp. 89, 105, 107). Both science and theology have "come to a chastened sense of their respective limits" (Oakes, 1992, p. 534). Geologist Simpson (1949) established at the beginning of his book on the meaning of evolution that "evolution and true religion are compatible. It is also sufficiently clear that science, alone, does not reach all truths, plumb all mysteries, or exhaust all values and that the place and need for true religion are still very much with us" (p. 5). Neither science nor religion can provide an "all-encompassing view of the universe which would explain all the remaining enigmas of the existence of the universe or of the knowing beings born within it" (Oakes, 1992, p. 534). They are now forced to look at each other for additional insight.

Snow, according to Neidhardt (1974), suggests that a means of bridging the gap between science and religion would be compulsory courses in science at all
educational levels. Neidhardt recommends studying both scientific and humanist foundations. There one would find a common bond: an individual's dependence, as he or she creatively seeks to understand all of reality, on faith. "Faith is a valid component of all human knowledge, scientific as well as religious. . . . Faith correctly viewed is that illumination by which true rationality begins" (p. 92).

Ellis (1994) explains that the choices made in all applied science and technological applications depend on values and well thought-out ethical bases. Science is unable to provide the needed value system. "This point is fundamental: there is no scientific test possible for what is good and what is bad" (p. 5). Religion is needed to contribute guidance for wise usage of scientific knowledge.

Frightened first by the development of nuclear weapons and later on by the threat of ecological disaster and by the dangers involved in modern biochemical techniques, a sense of responsibility for the application of their work has led many scientists to look for moral resources that could be mustered in order to prevent or at least to reduce the extent of fatal abuse of the possibilities provided by scientific discoveries. (Pannenberg, 1981, p. 3)

Polkinghorne (1994) maintains that there are some questions which arise from science but which go beyond its narrow power to answer. As the rational beauty of the physical world is revealed as they investigate, scientists are struck with its wonder. To many this points in the direction of religion (p. 4). Ellis (1994, pp. 1-14) and Swimme (1993, p. 111) both forcefully state the need for collaboration between science and theology, and they suggest that major problems facing the global society (e.g., racism, environmental abuse, social unrest) have arisen because of the separation of these two disciplines.
Roy (1981), from a position of extreme urgency, speaks to the need for science and religion to interact. "Humankind must indulge in cultural genetic engineering or it won't survive. It must interbreed religion and technology" (p. 1). Roy earnestly believes that the prognosis for modern civilization to make it through the next century is very poor and is convinced that science-based technology and religion should mutually interact for human survival. For these two fields to be opposed to each other is a luxury we can no longer afford (p. 1).

Schmidt (1993) acknowledges the scientific way of knowing as being an incredible human accomplishment, enabling the understanding of our natural and social environments, but he believes that to remain deaf to other ways of accommodating the world is limiting.

The language and method of science, with its emphasis on objectivity, precision, quantification, and empirical verification, needs to be complemented by an openness to expressions of feelings, commitment and wonder. Science and mathematics may help build skyscrapers, formulate actuarial tables, and send spaceships to the moon, but the language of the heart does not speak in numbers. (p. 80)

Schmidt further suggests that science is narrowly circumscribed by adherence to natural explanations and a need to stick to the "facts" resulting in a limited mode of discourse. "Familiarity with other more intuitive, existential, evaluative, and revelatory ways of knowing and speaking offers a corrective to the limits of science" (p. 81). Schmidt observes that "from a religious standpoint the sacred is revealed or discerned in manifestations that seem more given than exacted, more waited on and listened for than willed or mastered" (p. 84).
van Huyssteent (1993) reflects on the complexity of the world, the search for truth, and the questions which remain unanswered:

Today theologians and scientists, whether they agree or not, and whether they even talk or not, are together in their awe for the way the powers of human reason and imagination manage far to exceed our demands for biological survival, and for the extraordinary ability of the human mind to represent aspects of the world that are inaccessible to our ordinary senses. But scientists are also teaching theologians something today: the baffling and puzzling incompleteness of all our attempts at finding meaning and intelligibility in our world. Our knowledge of the natural world stretches out in two directions: to the basic constituents of physical reality on the one hand and to the higher levels of biological complexity on the other. We should indeed be in awe in the face of the amazing and inventive creativity of the world in which we have evolved: the elusive and unpicturable basic subatomic entities out of which everything is made, including ourselves, have potentialities unknown and indescribable in terms of the physics that discovers and the mathematics that symbolizes them. Therefore, at both the extremes of our comprehension—the subatomic and the personal—we face such baffling depths that even scientists today speak of the mystery of the universe. (p. 114)

To integrate matters of faith and science in this modern world, members of both disciplines are encouraged to communicate, clarify terminology, and recognize limitations. If people are given time, capacity, and motivation, they will attend to and process information which is incongruent with their own. As individuals interact with others who hold conflicting beliefs about the same information understanding can occur on both sides if mutual respect is established, accurate data is presented, and appropriate processing is accomplished (Crocker, Fiske, & Taylor, 1984, p. 205). "If a belief structure cannot be disconfirmed, it is likely that possible belief structure change will come from the interaction with
others who see the same information a bit differently" (Walsh & Charalambides, 1990, p. 519).

Barbour (1993) acknowledges that science and religion are not independent from each other and that state engenders conflict but he suggests that constructive dialogue and mutual enrichment are the benefits which come as a result of this interdependence.

We do not experience life as neatly divided into separate compartments; we experience it in wholeness and interconnectedness before we develop particular disciplines to study different aspects of it. There are also biblical grounds for the conviction that God is Lord of our total lives and of nature, rather than of a separate "religious" sphere. (p. 17)

The process of bringing the scientific and theological communities into dialogue began formally when the American Scientific Affiliation was founded in 1941 by a group of Christians who were scientists. Table 1 summarizes the efforts over the years for dialogue and cooperation between the worlds of science and religion. Many organizations have originated within university and seminary communities and have contributed substantially to interdisciplinary exchange.

More and more scientists and theologians (Barbour, Ellis, Jaki, Margenau, Mills, Oakes, Polkinghorne, Roy, Russell, Van Till to name just a few) are writing on the relationship between science and religion and mutual understanding is developing. Representatives from both areas recognize the contributions made by the other and the necessity for harmony and understanding in this complex world. Conferences and seminars designed to include these separate
Table 1. Timeline Highlighting Science/Religion Cooperation.

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>1941</td>
<td>Founding of the <strong>American Scientific Affiliation</strong> (ASA), a group of Christian scientists considering the relationship between faith and science</td>
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<tr>
<td>1954</td>
<td>Founding of the <strong>Institute on Religion in an Age of Science</strong> (IRAS), with Harvard University astronomer Harlow Shapely as its first president</td>
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<tr>
<td>1966</td>
<td>Publication of the first issue of <em>Zygon: Journal of Religion and Science</em></td>
</tr>
<tr>
<td>1968</td>
<td>Founding of the <strong>Institute for Theological Encounter with Science and Technology</strong> (ITEST), St. Louis, MO</td>
</tr>
<tr>
<td>1981</td>
<td>Founding of the <strong>Center for Theology and the Natural Sciences</strong> (CTNS), Berkeley, CA</td>
</tr>
<tr>
<td>1987</td>
<td>&quot;The Church and the Scientific Community: A Common Quest for Understanding,&quot; letter from Pope John Paul II to international scientists convened at the Vatican Observatory</td>
</tr>
<tr>
<td>1988</td>
<td>Opening of the <strong>Chicago Center for Religion and Science</strong> (CCRS)</td>
</tr>
<tr>
<td>1989</td>
<td>First Ecumenical Roundtable on Science and Technology, held annually, with widening denominational participation</td>
</tr>
<tr>
<td>1989</td>
<td>Formation of the <strong>Center for Faith and Science Exchange</strong> (FASE), Boston, MA</td>
</tr>
<tr>
<td>1990</td>
<td>&quot;Preserving and Cherishing the Earth,&quot; an appeal for cooperation issued to the world's religious communities by an international group of scientists</td>
</tr>
<tr>
<td>1991</td>
<td>&quot;The Joint Appeal in Religion and Science,&quot; a response from American religious leaders to the scientists' appeal of 1990</td>
</tr>
<tr>
<td>1991</td>
<td>Grant awarded to CTNS in Berkeley by the National Institutes of Health to research the theological and ethical implications of the Human Genome Initiative. This is an historic first: a scientific research agency awarding a grant for theological research</td>
</tr>
</tbody>
</table>

*(God and Science, 1993)*
disciplines are available in a variety of settings and are well attended; professional journals are published; newsletters abound. In 1993, for the first time in history, an institution of higher learning dedicated a chair to the two disciplines of theology and science when Princeton Theological Seminary appointed a Professor of Theology and Science (Roberts, 1993, p. 6).

Pope John Paul II has endorsed interaction between the two disciplines stating that science "can purify religion from error and superstition" while religion "can purify science from idolatry and false absolutes" (Sheler, 1991, p. 58). There is optimism that the gulf will be bridged at least in part as such efforts expand and members of both communities are open to dialogue and work for greater understanding. Vatican astronomer Corbally is quoted saying, "Always, the great minds in science have had this spiritual dimension, and this is something the Church encourages" (Dricks, 1994, p. 18). The Catholic Church was once a symbol of dogmatic opposition to scientific ideas that clashed with theology. However, in recent years it has sponsored conferences on subjects once considered taboo, such as cosmology and human evolution, indicating that the church has itself evolved over the years (p. 18).

The Anthropic Principle

Another inducement for the interchange between science and religion is the widespread interest in the anthropic principle which is similar to argument from design (which holds that God exists because of the organized complexity of
creation; a device so complicated and well adapted could only be consciously made) (Appleyard, 1992, p. 241). The anthropic principle suggests,

Significant alteration of either physical laws or boundary conditions at the beginning of the universe would prevent the existence of intelligent life as we know it in the universe. If physical laws were altered by a remarkably little amount, no evolutionary process at all of living things would be possible; so these laws appear fine-tuned to allow the existence of life. (Ellis, 1994, p. 5)

Appleyard (1992) explains:

In its weak form this says simply that our observations and theories must take into account the fact that we are here. The universe must have lasted long enough for conscious, carbon-based life forms to have evolved so the results of our observations of its present condition must be conditioned by the passage of that specific length of time. In its strong form the principle says that all the astonishing coincidences of physics, chemistry and biology that have conspired to produce us indicate that the fact that conscious life has evolved is the central, unique fact about this universe. (p. 238)

Scientists and theologians are aware of a number of critical considerations which, taken together, produce a fairly tight series of constraints on the way the world must be in order that we could be here to contemplate it. It seems more than coincidental, many believe, that the very precise conditions for life, and intelligent life at that, just happened. Many ponder, research, and publish on this topic (Barrow & Tipler, 1986; Davies, 1988, 1992; Gilkey, 1959; Munk, 1954; Ross, 1991; Russell, 1989).

The basis for the anthropic principle is the observation that the intricate chain of events--from the Big Bang to the formation of galaxies, of stars, of such heavy atomic nuclei as carbon, of life--is very fragile in regard to small disturbances in the laws and forces of nature. For instance, if you postulate that the strong nuclear force that keeps nuclei together had been stronger or weaker by a small
percentage, the whole delicate chain would have burst. Life would have been much more difficult, even for stars. We seem to live in an optimal universe, optimal for most complex structures that we can imagine. (Gustafsson, 1989, p. 7)

Jaki (1978) relates the number of astounding cases of mimicry, parasitism, and adaptations of organs which, if explained by natural selection, amounts to explaining "miracles by magic." He accuses Darwinians of looking at such examples all too briefly and suggests that purpose is a nightmare in the Darwinian universe (p. 283).

Westhelle (1989) observes the large number of coincidences within the very minimal fractions of the first second. "From this remarkable coincidence comes the anthropic principle which says that what we can expect to observe must be restricted to the conditions necessary for our presence as observers . . . we are not mere chance outcomes of an evolution" (p. 33). Polkinghorne (1990) asserts "it is not just any old world which is capable of producing men and women" (p. 1). This principle has been around since Aristotle propounded the concept of teleology, or final causation, supposing that individual objects and systems subordinate their behavior to an overall plan or destiny (Davies, 1988, p. 6).

Bowker (1981) speaks of a more recent term, teleonomy, a word which has been evoked by the sheer pressure of data. It refers to the reality that "some features of the evolutionary process seem to exhibit goal-directedness or channelling, somewhat of the kind found in programmed behavior" (p. 107). Furthermore, Bowker states:
The continuity between science and theology is that what we observe in all cases in this universe, including ourselves, is the transaction and transformation of energy. Much of our analysis, therefore, focuses on the question of constraint: what is it that constrains an event (short-lived or long-lived, from a molecule or less to a mountain or more) into the particular outcome which presents itself evidentially and makes demands on our comprehension? What cannot be ruled out at present (i.e., on the basis of our present understanding of the universe and of ourselves) - and in my guess is unlikely ever to be ruled out - is the possibility that among the constraints, which control energy transacted through the human system into its outcomes, are those which are derived informationally from a resource external to the human subject, which has traditionally been characterized theistically - as God . . . The possibility cannot be ruled out that God can participate in the human programme, particularly where it is looked for in faith. (pp. 121-122)

Along with questions posed by theologians, many scientists also attest to the perplexities associated with evolutionary theory and the major questions which persist in spite of much research. They are not so quick to dispose of former beliefs.

Many of these biologists, in trying to understand evolution, are still wedded to the old-fashioned but highly enigmatic notion of chance. Almost all of them feel, however, that the original Darwinian concept needs some qualification, needs an invocation of some directedness, perhaps even goal-directedness, but they are embarrassed and unwilling to call it purpose or design. (Margenau, 1984, p. 32)

Robert Frost pondered this dilemma:

What had the flower to do with being white,  
The wayside blue and innocent heal-all?  
What brought the kindred spider to that height  
Then steered the white moth thither in the night?  
What but design of darkness to appall? --  
If design govern in a thing so small.
The Darwinian claim that all the adaptive design of nature has resulted from a random search . . . is one of the most daring claims in the history of science. It is also one of the least substantiated. No evolutionary biologist has ever produced any quantitative proof that the designs of nature are within the reach of chance. (Denton, 1986, p. 324).

Munk (1954) states that if it is difficult to believe in God as the creator of this mysterious universe, the belief in chance requires even more faith. The probabilities against chance are so vast from the standpoint of mathematics that one can be reasonably certain that the universe did not come in this way, and God is the most promising alternative. Chance is the rock upon which atheism always shatters (p. 72).

**Evolution: An Apparent Threat**

In spite of various efforts at rapprochement, there remain some significant areas of misunderstanding and even conflict between the disciplines of science and theology. A prime example of a gulf which remains between many Christians and the world of science is that surrounding the theory of evolution. When Charles Darwin published *The Origin of Species* in 1859, he precipitated a controversy which raged for many decades both on the European continent and in North America. "Seldom in the history of the Christian church have theologians reacted as violently to a nontheological book" (Pelikan, 1965, p. 37). The new theory rocked the basic life and faith assumptions of many and continues to impact some parts of Christendom to this day. "Biological hypotheses such as that of Charles Darwin . . . contributed to the apparent fallibility of religious insights" (Wells, 1962,
p. 62). "To admit the findings of science raised doubts of the inerrancy of the Bible, and hence science was the Antichrist to be defeated at all costs" (p. 303).

In the opinion of many theologians Darwin threatened the trustworthiness of the Scriptures by casting doubt upon the literal accuracy of the narratives in the book of Genesis . . . The traditional Christian definition of the image of God in man seemed to clash with the idea of his descent from earlier and lower forms of life . . . Faith in the direction of divine providence over nature . . . could not stand if Darwin was right. Darwin's suggestions about the descent of man appeared to make the Augustinian doctrine of original sin through the fall of one human couple untenable . . . All these Christian doctrines, and many others besides, seemed to lose their moorings when Darwin cut the rope between man and Adam. (Pelikan, 1965, pp. 38-39)

The claim that the Bible is a unique and infallible revelation from God had been challenged by Newtonian science before Darwin. It gave use to a mechanical philosophy where nature was understood as a law-bound system. This view was incompatible to the Hebrew concept of nature where events were referred to the will of God and the line between the ordinary and the miraculous was very thin (Greene, 1961, pp. 5-6).

The revolution in scientific thinking associated with the theory of evolution as well as the changes it brought to theological thinking has resulted in much confusion and division within the Christian community as well as between the worlds of science and religion. It has also served as a catalyst which has stimulated research in biblical criticism and hermeneutics which has resulted in new approaches to Scripture interpretation and this has resolved the contradictions between Scripture and science for many Christians. They have found it
unnecessary either to negate their beliefs in God or to distort the significant role of Scripture in their lives by relying upon a more figurative and less literal view of some of the Scriptures which deal with the natural world. Many have made a belief change and have undergone a paradigm shift from a creationist viewpoint to that of a theistic evolutionist viewpoint which incorporates divine initiative with natural law. They have felt secure that their faith would withstand the substantial and credible evidence coming from science. They do not fear that their creator God might be contradicted by observable data from his creation. They see science as a noble and enriching quest that helps to make sense of the world in an objective and methodical manner. They understand it does not deny a meaning behind existence (Davies, 1992, p. 21).

It should also be noted that many people have made belief changes from the evolutionist viewpoint to that of the creationist viewpoint. Some of the factors which result in both types of change are included in this research project.

At the outset it must be clarified that the theory of evolution speaks to the evolution of life not the origin of life which is a separate inquiry in the scientific world (Vogel, 1984, p. 1). The theory of evolution is supported by evidence from geology, paleontology, and many other fields of science. The current hypotheses on the origin of life, however, do not have the substantial level of credibility and support given the theory of evolution. Many scientists and Christians believe the premises of the theory of evolution but do not have the data to make claims about any origin theory. While some interesting experiments have been produced
pertaining to origins, no strong claims are made for the resulting hypotheses. In this research effort, the theory of evolution makes reference only to the evolution of life, not to its origin.

Statement of the Problem

Many people have been taught the literal interpretation of the Scriptures and with it the two creation accounts in Genesis Chapter 1 through Chapter 2 Verse 3 (see Appendix B) since childhood. This literal means of interpretation is fundamental to their belief and faith for it establishes for them the authority of all Scripture and, in this particular case, the role of God in creation. For many Christians, especially within the Protestant community, scriptural authority is the foundation of faith in God, for comfort and guidance in this life and for the hope of a life to come. Changing the way in which the Scriptures are interpreted is understandably met with strong resistance, and belief change, when and if it occurs, comes slowly and painfully. Any change, even positive change, is accompanied by stress (Cell, 1984; Kotter & Schlesinger, 1979; Watson, 1972).

Exposure to conflicting belief can cement one's beliefs even more securely especially if the belief is central to one's life rather than peripheral. Messages that are discrepant with existing beliefs seem to reinforce those beliefs (Slater & Rouner, 1992, p. 597). Also, people cling to initial beliefs to a degree that is normatively inappropriate, a phenomenon called belief perseverance (Ross & Anderson, 1982). Zemke and Zemke (1988) hold that "information that conflicts
sharply with what is already held to be true, and thus forces a re-evaluation of the old material, is integrated more slowly" (p. 58). If the factors which aid belief modification as well as those which present the severest challenges could be understood more clearly, adults could more adequately be supported and guided as they attempt to make significant paradigm shifts.

How are profound belief changes accomplished? What factors contribute to these changes and what barriers exist for others who seek to correlate what they learn in the science classroom with what they learn in family devotions, a church sanctuary, a city-wide seminar, or seminary classroom? Is there a relationship between a particular belief or one's educational level and belief change? Most importantly, what role does critical thinking play in these shifts?

Do Christians apply critical thinking skills as they establish beliefs within the faith? Do they critically think when they listen to teachers, pastors, or seminary professors? Are they comfortable applying critical thinking skills when they read religious books or listen to Christian radio? Do they feel it is appropriate to use such skills when they read the Bible? Is critical thinking a part of scientific research?

**Purpose of the Study**

A great deal has been written in recent years on the conflict among Christians between belief in organic evolution and creationism as well as in the fields of belief and belief change and critical thinking. One purpose of this study is
to combine these three subjects to determine whether critical thinking has a strong influence in establishing belief or directing belief change with reference to evolution and creationism and to identify what other factors may be operating to influence belief in these areas. Another purpose is to inform and aid students, parents, pastors, congregants, museum educators, seminarians, teachers or other interested persons in understanding the issues which surround the subjects of creationism and evolution.

The ultimate purpose is to shed light on a subject which has resulted in dissention and controversy, with the hope that Christians might be informed and more open to the many facets of this dilemma and as a result be more understanding and tolerant of one another's convictions. This could only have positive results for the Kingdom of God in this world.

Research Questions

This research is concerned with three problems:

(1) Upon what bases do Christians arrive at belief with respect to creationism and organic evolution? Is critical thinking utilized?

(2) How do Christians undergo belief change with respect to the subjects of evolution and creationism? Is critical thinking utilized?

(3) Is there a relationship between level of education, critical thinking skills, doubt or certainty, or type of biblical interpretation and belief in creationism or organic evolution?
Definition of terms

**Attitude:** Less stable than belief; determined by socio-cultural and psycho-biology factors and closely related to an individual's personality; may shift with new experiences and learning (Gordon, 1971, p. 246). The relation between two entities where one is a person and the other is a person or an object as well as the contextually defined relationship between them (Palmerino, Langer & McGillis, 1984, pp. 181-182). At times, used interchangeably with belief.

**Belief:** Relatively stable emotional and cognitive disposition, usually associated with major abstract issues, particularly religious or those of high emotional significance (Gordon, 1971, p. 245). One of the overt expressions of faith or an avenue to faith; the holding of certain ideas (Smith, 1979, pp. 12, 17-18). "Tools we use to make sense of the world" (Chaffee, 1985, p. 178). At times, used interchangeably with attitude.

**Creationism:** The belief that God created the world by divine fiat, ex nihilo (out of nothing), as is literally expressed in Genesis 1, in six 24-hour (solar) days, no more than ten thousand years ago; (Institute for Creation Research, undated). Plant and animal "kinds" were miraculously created and are essentially fixed (Moore, 1993, p. 43).

**Creation science:** "The scientific evidence for creation and inference from those evidences" (LaFollette, 1983, p. 15-16). See "Scientific creationism."
Critical thinking: The ability of the mind to objectively and effectively question its own assumptions and the sources underlying its belief; to shape belief by phenomena other than custom, fear, reward, punishment, or chance. The art of identifying and removing bias, prejudice, half-truths and distortions. "Critical thinking is disciplined, self-directed thinking which exemplifies the perfections of thinking appropriate to a particular mode or domain of thinking" (Paul, 1990, p. 33). Critical thinking is "the careful, deliberate determination of whether we should accept, reject, or suspend judgment about a claim--and of the degree of confidence with which we accept or reject it" (Moore & Parker, 1992, p. 4). "Critical thinking is reflective and reasonable thinking that is focused on deciding what to believe or do" (Ennis, 1985, p. 45). "Making sense of our world by carefully examining our thinking (and the thinking of others) in order to clarify and improve our understanding" (Chaffee, 1985, p. 33).

Christian Doctrine of Creation: The universe is the handiwork of a divine creator who brought it into being ex nihilo. "The Creator means the God of the historical revelation, the Father of our Lord Jesus Christ, the Triune God; and by "creation" it means that event which is founded in the revealed divine decree of Creation" (Brunner, 1952, p. 5).

Evolutionary naturalism: That form of naturalism which claims that the scientific concept of evolution provides a sufficient basis for rejecting the idea of divine governance of natural processes (Van Till, Young, & Menninga,
24


**Faith:** A personal surrender and conduct inspired by such surrender (Vine, Unger & White, 1985, p. 222); an engagement: to become involved. A total response; an attitude to truth; not merely a dedication to truth but an applauding of it and an acting in terms of it; (Smith, 1979, pp. 6, 12, 81-82, 129, 133). Faith is being sure of what we hope for and certain of what we do not see (Hebrews 11:1, New International Version, Holy Bible, 1973, p. 1262). "Faith is the state of being ultimately concerned, and the demands made by one's ultimate concern as well as the promise of ultimate fulfillment which is accepted in the act of faith" (Tillich, 1957, p. 2). In this research paper, when faith is mentioned it means personal surrender to God; a total response to God; being ultimately concerned about the Kingdom of God.

**Fundamentalists:** There are fundamentalists within many religious settings. When the term is used in this thesis it refers exclusively to fundamentalists within American Protestant Christianity who hold a conservative and more authoritarian theology and, along with affirming the fundamental tenets of Christianity, adhere to a strict belief in the literal interpretation, inerrancy, and infallibility of the Bible. See Appendix F for a further description and historical overview of this movement.
Mainline Protestants: A large segment of contemporary Christians representing the traditional theology of Protestantism who are associated with various denominations. This theology includes the fundamentals of Christianity: the virgin birth, substitutionary atonement, resurrection and second coming of Christ. However, among mainline churches there are many variations of belief on the subject of biblical infallibility and inerrancy. See Appendix G for a further description of mainline Christianity.

Naturalism: Similar to scientific materialism, this is a philosophical and religious perspective which is based on the assumption that the physical world is all there is, that there exists no divine being capable of influencing physical phenomena (Van Till, Young, & Menninga, 1988, p. 11). See "Evolutionary naturalism." Sometimes called evolutionism.

Opinion: Malleable dispositions towards an object, institution, person or artifact in the individual's world. Can be expressed relatively precisely when compared with attitudes or beliefs, and involves feelings as well as conditions. Can be arrived at casually, with or without examining the evidence (Gordon, 1971, p. 246).

Organic evolution: Changes in the structure, function and adaptation in living organisms over time and the underlying genetic changes such as mutations, processes of natural selection, and population dynamics such as nonrandom mating and genetic drift or other factors that explain how these changes occur (Curtis & Barnes, 1989, p. G-8). Such change can lead to success.
(adaptation) or failure (extinction) and can lead to new species of plants and animals. Evolution continues to take place today (Gallant, 1989, p. 165).

**Science:** Discipline characterized by its being guided by natural law, its being explained by natural law, its being testable by the empirical world, its conclusions are tentative and it is falsifiable (Overton, 1982, p. 938).

"Science seeks a systematic organization of knowledge about the universe and its parts. This knowledge is based on explanatory principles whose verifiable consequences can be tested by independent observers. Its investigators claim no final or permanent explanatory truths. Science changes. Verifiable facts always take precedence" (Knight, 1985, p. 118).

**Scientific creationism:** That perspective which proceeds from the claim that it is possible to employ the results of natural science to demonstrate that the universe was recently created in a mature and fully functioning form; that is, that the religiously derived concept of special creation can be validated by the results of scientific investigation (Van Till, Young & Menninga, 1988, p. 11). See "Creation science."

**Scientific materialism:** "Belief that the scientific method is the only reliable path to knowledge and that matter (or matter and energy) is the fundamental reality in the universe" (Barbour, 1993, p. 7). See "Evolutionary naturalism" and "Naturalism."
**Theistic evolutionism:** The belief that God created the heavens and the Earth and all that is therein using the processes of evolution, some of which are understood and some of which are not. May also be referred to as "progressive creation" or even "old earth creation" (H. M. Morris, 1995, p. 3).

**Theology:** "Critical reflection on the life and thought of the religious community" (Barbour, 1993, p. 6). The study of the nature of God and religious truth; rational inquiry into religious questions, especially those posed by Christianity (Morris, 1979, p. 1334).

**Theory:** "A detailed description of some facet of the universe's workings that is based on long observation and, where possible, experiment. It is the result of careful reasoning from those observations and experiments and has survived the critical study of scientists generally" (Asimov, 1993, p. 277).

**Theory of Evolution:** Scientific theory stating that organic evolution has operated and is operating in the living world. Pertains to the evolution of life, not the origin of life, which is a separate area of inquiry.

**Transformative learning:** "The process of learning through critical self reflection, which results in the reformulation of a meaning perspective to allow a more inclusive, discriminating, and integrative understanding of one's experience. Learning includes acting on these insights" (Mezirow, 1991a, p. xvi).
Limitations and Delimitations of the Study

Limitations

This study is limited to the extent that the Watson-Glaser Critical Thinking Appraisal is a valid measure of critical thinking and an appropriate instrument for this particular project.

There is also concern that participants clearly communicated what they believed and the bases upon which they established those beliefs and also that the data so revealed was accurately interpreted. The questionnaire and interview questions may not have gathered with precision the information of primary importance which was desired.

It is obvious and readily admitted that the scope of this work, including science, religion, belief, and critical thinking is too broad and deep to be exhausted by this present research effort. As Dobzhansky (1967) said of his book The Biology of Ultimate Concern, "It is to cover a canvas so broad that the whole cannot possibly be the specialized knowledge of any single person" (p. 11). As he expressed, "it is because of the urgency that we try, in spite of the vastness of the subject."

Delimitations

Delimitations of this research include the fact that participants were taken from a narrow geographical area (northcentral Montana). It is generally known that Christianity is expressed differently in word and worship in various regions of
the United States. If percentages of creationists versus evolutionists within the
Christian community were being studied, no doubt there would be a greater
number of creationists found in the southern regions of the United States, which
have a greater percentage of fundamentalist Christians, than does Montana.
However, when belief basis is being analyzed, as is the focus of this study, the
differences are presumed to be quite negligible between creationists from the
South or from the North or evolutionists from the East or the West. The various
ways that people arrive at and form beliefs is presumed to be quite consistent
within a general culture. In the event that geographical location does present a
variable, this study is so limited.

In addition, only avowed Christians were included and they were mostly
church members. Christians who were not members of churches were not
excluded but were not particularly sought. Participants came from four
populations of Christians. It is possible that the data would be different if other or
additional groups had been included.

This research was confined to the theory of evolution, not the theories
associated with the origin of life or of humans in particular.

Organization of the Study

This dissertation is organized into five chapters plus references cited and
Appendices A-L. Chapter 1 is an introduction which includes a background
overview, a statement of the problem, the purpose of the study, research questions,
the definition of terms, limitations and delimitations of the study and the organization of the study.

Chapter 2 contains the literature reviews. There are four areas of subject matter which impinge upon this research question and therefore this chapter includes four separate literature reviews: (a) creationism and evolution; (b) the identity, purpose, origin and interpretation of the Bible; (c) critical thinking and transformative learning; and (d) belief and belief change. All four of these areas are significant and relevant to this research, however part (b) is disproportionately lengthy because the key to this particular dilemma between science and the Christian religion rests on the comprehension of the origin, authority, and interpretation of the Bible. If this is not thoroughly understood, the problem of this research project cannot begin to be grasped or have any hope to be resolved.

Chapter 3 describes the methodology used in this study including general research design, a description of the population, and instrumentation.

Chapter 4 includes the findings with an introduction, demographics on the sample, and presentation of data from questionnaires and interviews.

Chapter 5 summarizes the findings, presents discussion, and states conclusions based on the findings. Recommendations for further study or action are delineated and explained, and reflections and applications for the Christian church are included.
CHAPTER 2

RELATED LITERATURE REVIEW

Creation, Evolution, and Creationism

Historical Perspective

Darwin, an avowed Christian in his early years, brooded over the implications of his data and postponed publishing his theory for many years. Gillespie (1979) noted that "Darwin and his colleagues were strikingly capable of impressive mental ambivalence over considerable periods of time" (p. 6). At one point, Darwin lamented "I am ... in an utterly hapless muddle. I cannot think that the world, as we see it, is the result of chance; and yet I cannot look at each separate thing as the result of Design" (p. 87).

Ultimately, toward the end of his life, Darwin stated in his autobiography the old argument of design in nature ... which formerly seemed to me so conclusive, fails, now that the law of natural selection has been discovered. We can no longer argue that, for instance, the beautiful hinge of a bivalve shell must have been made by an intelligent being like the hinge of a door by man. There seems to be no more design in the variability of organic beings and in the action of natural selection, than in the course which the wind blows. Everything in nature is the result of fixed laws. (Barlow, 1958. p. 87)

The Origin of Species made four basic claims. First, the inanimate world was not static, but dynamic; it was constantly changing and thus species now in
existence were different from those that had existed in the past. Secondly, the changes could be small and numerous or large and rare. Thirdly, all living organisms had evolved through the millennia from a single source. Finally, there were innumerable variations within a species and those individuals which survived possessed the variations which best equipped them to fight the battle of existence (Clark, 1984, pp. 122-123).

There were many who hinted at an evolutionary paradigm prior to Darwin. Cuvier (1769-1832) analyzed fossil bones and concluded that hundreds of animal species had become extinct and that there seemed to be an evolutionary trajectory to the biological world. Lamarck (1744-1829) believed the world to be much older than the 6,000 years described in the Bible and he also arranged the biological world in a sequence from humans to invertebrates. Smith and Lyell in the 1830s attempted to show that the Earth was formed through slow geological processes. Spencer applied the concepts of "natural selection" to human societies before Darwin applied it to the biological world (Wenke, 1984, pp. 13-15).

Creation, Creationism, and Evolution

The distinction between creation and creationism must be clarified. The former refers to the Christian doctrine of creation, which asserts that God is the creator of the universe and all that is therein, including life. It affirms the Scriptures which state over and over (see Appendices B-D) that God created the heavens and the Earth and all that is therein. In its most general sense it makes no
claims as to how God accomplished his creative work, although no doubt some Christian groups delineate precisely that the doctrine includes a spontaneous creation occurring over six solar days. Creationism, on the other hand, maintains not only that God created but it also embraces a belief in how God created, specifically, in six 24-hour days according to the account in Genesis 1. Creationism also includes additional beliefs in a catastrophic, worldwide flood, and a young Earth hypothesis.

Christians who believe in evolution attest to God as creator and suggest that this is one means by which God has accomplished the work of creation. Technically, they can be called "creationists" if a creationist is one who believes God is the creator. They are called "evolutionists" for that expresses the means of creation. The term "theistic evolutionist" asserts God as creator using evolutionary processes and distinguishes from a "creationist," a term generally applied to one who believes God is the creator but accomplished that creative activity in six 24-hour solar days.

Theologian Brunner (1952) clarifies the distinction between evolution and creation, a point clearly misunderstood by many in the Christian community. Evolution, even creative evolution, is a phenomenon which we are able to observe, something which is in the foreground of empirical fact, something which the botanist and the zoologist can establish over and over again in his researches. . . . But he can never thus prove creation. Creation remains God's secret, a mystery, and an article of faith, towards which the fact of creative evolution points, but which is never contained within it. What the scientist himself interprets, on the basis of his empirically established positions, as creative evolution, he believes, praying, to be God's creation. (p. 35)
Some comparisons of creationism and evolution are summarized by Radner and Radner (1982, pp. 6-7) in Table 2.

Table 2. Comparison of Creationism and Evolution.

<table>
<thead>
<tr>
<th>Creationism</th>
<th>Evolution</th>
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<tbody>
<tr>
<td>- God created living things according to their kinds</td>
<td>- Present format of life evolved from earlier forms through mutation, natural selection, genetic reconstruction, etc.</td>
</tr>
<tr>
<td>- Vegetation 3rd day</td>
<td>- Animal and plant species came into being during different geological periods, leaving behind a fossil record</td>
</tr>
<tr>
<td>- Sun/moon 4th day</td>
<td></td>
</tr>
<tr>
<td>- Fish/birds 5th day</td>
<td></td>
</tr>
<tr>
<td>- Cattle and creeping things 6th day</td>
<td></td>
</tr>
<tr>
<td>- Nothing mentioned about extinct species</td>
<td>- Many extinct species</td>
</tr>
<tr>
<td>- Catastrophism</td>
<td>- Uniformitarianism</td>
</tr>
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</table>

Kuhn (1970) asserts that what troubled most Christians during the 19th century was not the suggestion of evolution per se, but the accompanying proposition presented by Darwin in *The Origin of Species* that there was no set goal either by God or nature. All pre-Darwinian theories of evolution, those of Lamarck, Chambers, Spencer, and the German Naturphilosophen, had taken evolution to be a goal-directed process. "The belief that natural selection, resulting from mere competition between organisms for survival, could have
produced man together with the higher animals and plants was the most difficult and disturbing aspect of Darwin's theory" (pp. 171-172).

Some respected scholars of that period, such as Harvard botanist Asa Gray, did not surrender their faith to this new dogma. Gray grappled for years with the idea of evolution and the ramifications it carried for inevitably modifying his personal beliefs. Darwin's premier contemporary supporter in America, Gray held tenaciously to his faith, although his knowledge of evolution tested him severely. He "rejoiced in any proposed modification of the Darwinian theory that would lessen the iron rule of natural selection and open up possible areas for divine activity" (Gillespie, 1979, p. 117).

Gray "tried to reconcile Darwinism with a cosmic purpose by contending that the apparent incompatibility was due to an unnecessary association of the idea of design with that of special creation" (Dupree, 1959, p. 260). "Why could not a creator work through the evolutionary process, his providence operating, as it were, on the installment plan" (Kennedy, 1957, viii)? "Both Darwin and Gray felt they must follow the chains of cause and effect through the facts of nature regardless of the unexpected path that journey might take" (Dupree, 1959, p. 260).

Gray maintained that true religion had nothing to fear from Darwin, and in fact could learn much from the perspective Darwinism provided. Evolutionary thought describes how a portion of the created order operates; but it neither says nor implies anything about the author of creation, his purposes, or his plans. Religion is still needed to make our picture of the world complete, Gray would
have affirmed (Rachels, 1991, p. 84). Biographer Dupree (1959) states that, at the end of Gray's life, "Science changed religion not at all, when all about cried revolution. Science was not a substitute religion. A humble believer in the Christian faith in 1846 or 1858, he was the same in 1887" (p. 417).

Still others, distinguished scientists such as Faraday, Maxwell, and Lord Kelvin, could not accept the theory of evolution (Ham, 1991, p. 67). American naturalist Agassiz, a contemporary of Gray, "refused to the bitter end to accept Darwinism or evolution in any form. To Agassiz, Darwinism was a crude and insolent challenge to the external verities, objectionable as science and abominable for its religious blasphemies" (Hofstadter, 1957, pp. 3-4). Many people of faith today find it equally difficult to embrace.

The scientists in the 19th century, as well as many people to this day, who tried to understand the theory of evolution and who were committed to the Christian faith were faced with the necessity of accommodating to a new paradigm. No one steps quickly and easily from one world view of science and theology to another. Belief structures are thought to be relatively resistant to change (Crocker et al., 1984, p. 198). When 19th century naturalists attempted to adapt to the changing scientific paradigms they found that "the new conception of science and nature developed within the practice of the old and grew out of the needs and internal tensions that developed in that practice. Its birth was a gradual process varying from naturalist to naturalist and taking more than a generation to be accomplished" (Gillespie, 1979, p. 4). Change, especially as it relates to something
so personal as faith, is resisted, and when it can be resisted no longer it often is accompanied by conflict and stress and may require considerable time (Watson, 1972). In The Interpreter's Bible, expositor Simpson (1952) states,

That collision between the new teachings and the old tradition seemed at first as shattering as an earthquake. Multitudes of men and women reacted in panic or in defiance, supposing that if their confidence in the literal exactitude of the first verses of Genesis should go, then their whole religious faith would be gone with it. Yet the new teachings had come not to blight religion but to stimulate it to new growth. If they seemed at first to break up old patterns of belief, the result was to lift men's eyes to mightier perspectives of the majestic works of God. (p. 462)

The theory of evolution required explanation and that was difficult for it was not completely formulated. Even today, though there are volumes of supportive, empirically derived evidence and a greater amount of rationality associated with it, much effort and considerable training is required to learn the data and their significance, and to weigh the arguments from all sides. Confusion reigns in part because many Christians do not separate what scientists say about the origin of life from what they say about the evolution of life and also it is not clear among many Christians that there is room for a Designer within the evolutionary paradigm.

The Fundamentalist Response

The group within Christendom which is troubled most by Darwinian evolution includes mostly fundamentalist Christians, primarily within the United States, who maintain that the record of creation in six 24-hour days, as found in the
first Chapter of Genesis in the Scriptures, is factual and literal truth (Morris, 1974). Interestingly, other biblical accounts which differ from the first Chapter of Genesis such as Genesis 2, Job 38, Psalm 104, John 1, and Proverbs 8 (see Appendix C) are not given the pre-eminence afforded the account in Genesis 1.

For many, the theory of evolution challenges the authority of Scripture, the belief in God as Creator, and even the very existence of an omnipotent, omnipresent, eternal Being who designed and governs the universe and life as we know it. Science, for them, has threatened to dominate or even replace religion with empirical data overriding faith. They believe there is even Scripture to warn against such eventualities. In the first book of Timothy (6:20-21) in the New Testament, the Apostle Paul warns Timothy, "Avoid . . . foolish arguments of what some people wrongly call 'knowledge.' For some have claimed to possess it, and as a result they have lost the way of faith" (Good News Bible, 1976, p. 287). Swaim (1953) maintains that this text has nothing to do with science but was applicable to the author's immediate situation, perhaps pertaining to the way the scribes interpreted the law or possibly it refers to the false beliefs collectively known as Gnosticism which the early church had to combat. He believes the Bible is being misread if this passage is interpreted to set up opposition between knowledge and faith (pp. 123-124).

Momentum for belief in the literal interpretation of Genesis gathered during the 1920s with the Scopes trial in 1925 which received national attention. Tennessee had already passed a law prohibiting the teaching of any scientific
theory which was contrary to the Bible. Wells (1962) maintains that the fundamentalists of that era, with few exceptions, did not even understand the theory of evolution but rallied to defend the literal interpretation of the Scriptures (p. 302). Hays (1957) summarizes the trial saying Bryan, the prosecuting attorney, felt that this was a fight between religion and atheism or agnosticism.

He never realized that it was a fight merely between a literal interpretation of the Bible and common sense. He rested religion upon the precise verbiage of the Book and insisted that religion would fail if those words were not accepted literally. Instead of accepting the spirit of religion or of Christianity, he accepted words, many of them wrong words, many of them representing improper translations, all of them representing the ideas of men of thousands of years ago who spoke the language and expressed the ideas of their time. Such views lead to the downfall of religion, not to its growth. If to be religious one must believe things that his mind will not accept, he must, perforce by human reasoning reject religion. (p. 36)

In the decades which have followed, research centers have been organized by creationists within the ranks of fundamentalism, most notably, in 1972, the Institute for Creation Research in El Cajon, California. Detailed and comprehensive histories of the creationist movement leading up to this organization are contained in Numbers (1992) and Moore (1973). "There are nearly 50 creationist organizations in the United States, another dozen in Canada and more in other countries from England to Australia and from Germany to India to Brazil" (Hyers, 1985, p. 411). Books, tracts, study programs, cassettes, films, and videos are available; periodicals are being published in abundance and field research projects and summer institutes are conducted. Curriculum is available for home schools for all ages of children. Well orchestrated seminars at college
campuses and in cities across the nation are presented which attract thousands of people and the organizers feel a deep sense of religious call.

Unfortunately, the public sees the problem as a creation versus evolution problem and the Institute for Creation Research encourages this perception (Gish, Bliss, & Bird, 1981, p. ii; Overton, 1982, p. 936). It is not. "Creation (as taught by virtually all Scripture scholars and as accepted by most Protestants, Catholics, and Jews) and evolution are not mutually exclusive concepts. The problem is not creation versus evolution but scientific creationism versus evolution" (Kenkel, 1985, p. 59).

Scientific creationism is the thesis that scientific investigation can validate the recent earth, special creation, and global flood hypotheses of creationists (Morris, 1974; Van Till et al., 1988).

Evolution (of itself) neither affirms nor denies a Creator. Evolution (of itself) neither validates nor negates creation. Evolution and creation are not essentially joined, nor are they mutually exclusive. . . . Evolution is science; creation is faith (in a Creator); each is looking at the origin of mankind and the universe from its own perspective. A person may espouse science, faith, both, or neither. (Kenkel, 1985, p. 62)

Many of the more conservative seminaries and Bible schools continue to teach creationism dogma and there is a growing network of fundamentalist private schools. The American Association of Christian Schools, with more than 1,000 member institutions, requires as a condition of affiliation acceptance of the statement "We believe in creation, not evolution" (Hyers, 1985, p. 411). This
statement infers that a belief in God as creator leaves no room for his method possibly being evolution.

Marty and Appleby (1993) state that students from fundamentalist schools perform quite well on the Iowa Basic, the SAT, and other standardized tests "but score poorly when evaluated on independent judgment, critical thought, and exposure to competing views on various topics" (p. 14). Rose (1993) describes "a pattern of instruction that tends to minimize critical thinking and to limit students' exposure to diverse materials and perspectives" (p. 463) among Christian schools. Students, states Rose, are not taught to think critically, to formulate significant questions, or to explore alternative answers, and they have little voice within the context of the classroom. This persists even on the high school level (p. 463).

There is a population of "closet six-day creationists" dispersed throughout Christendom, within the denominations of Protestantism as well as in Catholic congregations. As data from this research shows, members of these churches compose some of the attendees at creationist seminars. They also monetarily support the efforts of the creationist movement.

Fundamentalists who are creationists hold to a young earth hypothesis, believing the earth to be no more than ten thousand years old (Morris, 1974, p. 153). They deny the constancy of radioactive decay rates and hence the validity of orthodox age-dating methods (Knight, 1985, p. 117). They believe that the geological formations including mountain ranges, rivers and canyons, mass extinctions of the past, continental drift, and the great ice ages were caused by a
worldwide flood during the time of Noah (Ham, 1993, pp. 16-18; Morris, 1974, pp. 117-130).

Moore (1993) relates events in the life of Wonderly, a creation scientist and former head of the biology department of a fundamentalist college, who in the early 1970s attempted to alert his colleagues to the implications of data procured on corallines, marine animals that leave their skeletons to deposit and fossilize in reef formations. Reefs as thick as 4,610 feet have been discovered in the Eniwetok Atoll, Marshall Islands. The time for this deposition has been approximated at 170,000 years. This dating would be rejected by creation scientists who maintain that animals could not have begun to die until after the fall of Adam, a few thousand years ago.

Creation scientists can deal with this data in several ways: (1) such reefs were built up more rapidly in ancient times, leaving the appearance of age, or (2) concede that the death of some animals took place before the fall. Moore suggests that neither prospect seems likely to find favor in fundamentalist circles which leaves a third avenue of escape: ignore or suppress the data.

Wonderly's efforts to enlighten his colleagues led to accusations of infidelity. Eventually, he stated,

So many Christians are just accepting the young earth view because men of seemingly high educational stature are telling them that "science has now shown that the earth is probably very young," "the Bible says it's young," etc. This wouldn't be so bad except that along with it goes the claim that any other view is to be avoided--and the people who believe it avoided. (Moore, 1993, pp. 58-59)
Moore states that "postmillennial fundamentalist creationism demands a return to Old Testament law—it is unabashedly totalitarian and theocratic. There is no concept of 'natural law' in Genesis; no scope for 'the philosophy that all people have a right to their own opinions'" (p. 62).

It is not surprising that quite a degree of confusion reigns among sincere Christians as to where the truth resides and this dichotomous thinking has contributed its share to the splintering of Christians in America. At an Institute for Creation Research "Back To Genesis" seminar which this researcher attended on 24-25 September, 1993, in Great Falls, Montana, the seminar leader named several well established, respected Christian colleges and declared that faculty in their biology departments were sympathetic to evolutionary theory. A statement was read from a mainline denomination communicants' handbook which supported belief in evolutionary theory. These institutions were seen by the several thousand member audience as liberal (to them a negative, worldly position) and as teaching false doctrine. An "us" and "them" mentality is fostered by this kind of leadership.

The Institute for Creation Research publishes a list of colleges and seminaries which teach creationism and an institution is judged on the basis of this one area of belief. Individuals are pressured to take sides against the "secular humanists," many of whom are their brothers and sisters in the faith, who happen to espouse evolutionary theory.
Besides dividing the Christian community to some degree, scientific creationists have also impacted the attitudes and impressions scientists and others have toward the Christian faith. By making it clear that they believe the motives and methods of science are suspect, it is not surprising that many in the scientific community avoid them. Because they are outspoken and visible, their brand of Christianity is the only one seen by many non-Christians who, understandably, often reject the whole Christian religion in general. "Mainstream religions have become complacent and too often radical groups are seen as speaking for all Christians" (Crist, 1993). "Those representing a moderate and presumably normative position on the Bible and science have been napping" (Hyers, 1985, p. 412).

Creationists are aware of the respected scientists who sincerely believe the universe had no design and that everything from the big bang down to the development of life, to the self-actualizing brain of *Homo sapiens* arrived by chance. Along with Darwin, Dawkins (1987) attempts to explain why the evidence of evolution reveals a universe without design. Sagan (1980) declares, "The cosmos is all that is or ever was or ever will be" (p. 1). Rachels (1991) maintains, "We must realize that we are products of the same evolutionary forces, working blindly and without purpose, that shaped the rest of the animal kingdom" (p. 1). Monod (1971) states, "The ancient covenant is in pieces; man at last knows that he is alone in the unfeeling immensity of the universe out of which he emerged only by chance" (p. 180). Gould (1985) believes that the human species exists by virtue
of a long series of lucky evolutionary breaks "partly random and, in any case, not
designed for us or towards us" (p. 15).

Such strong statements of unbelief within the scientific community have not
gone unnoticed by Christians, and evolutionary science is seen by them as a serious
foe of religion. The stance of evolutionary naturalism is incorrectly equated to
evolutionary theory by many Christians and it has sometimes engendered intense
emotionalism and militant urgency.

If it is true that everything "just happened,"

then no one need take the Bible seriously, or even God seriously. If
God did not create the universe, why should it be thought that he has
a purpose for it or is in any way involved in our lives? If God did not
create the world, why should he get involved with it? If he did not
create the world, we would even have reason to doubt that he could
get involved with it. If he could, he would be an intruder into a
world that just happened and over which he would have no claim.
(Cole, 1985, p. 71)

Some Christians even go so far as to assert that the popularization of
Darwinian evolution is one of the strongest forces today that facilitates the
destruction of families and nations (Ham, 1991, Introduction). Deen, a Georgia
judge quoted by Pierce (1981, p. 82), states, "This monkey mythology of Darwin is
the cause of permissiveness, promiscuity, pills, prophylactics, perversions,
pregnancies, abortions, pornotherapy, pollution, poisoning and proliferation of
crimes of all types."

LaHaye (1980) maintains that,

The humanistic doctrine of evolution has naturally led to the
destruction of the moral foundation upon which this country was
If you believe that man is an animal, you naturally expect him to live like one. Consequently almost every sexual law that is required in order to maintain a morally sane society has been struck down by the humanists, so that man may follow his animal appetites. (p. 64)

Interestingly, theologian Tillich suggests that the trend in society away from religion was instigated by literalist, fundamental Christians.

The first step toward nonreligion of the western world was made by religion itself. This was when it defended its great symbols, which were its means of interpreting the world and life, not as symbols, but as literal stories. When it did this it had already lost the battle. (cited in Dobzhansky, 1967, p. 34)

The belief in spontaneous creation is vigorously taught in fundamentalist churches, seminaries, and private colleges and its belief basis is referred to as scientific creationism, a term some scientists call an oxymoron (Dickerson, 1990, p. 51; Taylor, 1992, p. 284). Creationists have had some success over the years in influencing public education including textbook and curriculum content. A major defeat came in 1982 when the U. S. District Court, Eastern District of Arkansas, prohibited the enforcement of Act 590 which stated, "Public schools within this State shall give balanced treatment to creation-science and to evolution-science" (Overton, 1982, pp. 934-943).

**The Nonliteralist Response**

In the early decades of the 20th century, especially with the rise of molecular genetics, many people became adherents of evolutionary thinking. As additional evidence was introduced from such diverse fields as geology,
paleontology, anthropology, biochemistry, embryology, anatomy, cytology, biogeography, and taxonomy, more scholars recognized its tenets as reasonable.

Not only were scientists drawn to the veracity of this body of evidence, but Christian and Jewish theologians as well. Christian scholars were determined that the church should not hide from the results of the critical study which had been fomenting. Fosdick delivered a series of lectures in 1924 at Yale University and concluded with these rallying words: "Have no fear of the new truth! Let us fear only our own lack of wisdom, insight, courage, and spiritual power in using it for the redemption of the souls and societies of men" (1958, p. 273). Mackay (1944), editor of the new journal, Theology Today, stated in its first issue,

The Bible, which was rediscovered by the Reformation, must be rediscovered again. Bibilolatry we must, of course, eschew. Intellectual integrity and the Bible itself demand that the rights of biblical criticism be safeguarded, and authenticated facts regarding the history and literary composition of the biblical records be joyfully accepted. But now more than ever, following the fierce scrutiny of the years, the essential unity of the Book stands out in bold relief, and the progressive revelation within it of God's redemptive purpose, which culminated in the life, death, and resurrection of Jesus Christ, and the subsequent descent of the Holy Spirit, has been transfused with new meaning. (editorial)

Shipley (1927), quoting Parrish, declared,

Religious authority, like the medieval mind, looks always backwards, toward the past. Its wisdom, its mysteries, its experiences with God, its miracles, its revelations, all took place centuries ago . . . But if God is the creative and controlling power of the universe, why confine His operations to the first few years of the Christian era? . . . Let us think out the interpretations for ourselves, untrammeled and de novo. Let us breathe the fresh air of this new morning without forever smelling the dust of obsolete libraries. (p. 10)
A popular and influential preacher of Plymouth Church in the 1880s, Beecher (1957), declared from his pulpit, "To the fearful and timid let me say, that while Evolution is certain to oblige theology to reconstruct its system, it will take nothing away from the grounds of true religion" (p. 19). Hofstadter (1957), referring to Beecher, agrees, "Theology would be corrected, enlarged, and liberated by evolution, but religion, as a spiritual fixture in the character of man, would be unmoved" (p. 13).

Beecher (1957) chided those Christians who said they knew their religion was true and did not wish to hear anything that threatened to unsettle their faith. "But faith that can be unsettled by the access of light and knowledge had better be unsettled. The intensity of such men's faith in their own thoughts is deemed to be safer than a larger view of God's thoughts" (p. 17).

Theologian Brunner (1952) states,

The Bible assumes that the plants and animals with which we are familiar are part of the unalterable original state of the world as God created it. The findings of Natural Science . . . force us to give up this idea entirely. Whatever may be our attitude towards the theory of evolution . . . , at one point the discussion has been closed forever, namely, that most of the forms of life which now exist did not formerly exist at all, that many of those which used to exist no longer do so, and that between the earliest and the present-day forms of life . . . there were very many others, so that those which now exist prove to be one of the many worlds of forms which followed each other in orderly progression. (pp. 32-33)

Brunner continues that "none of these scientific results affects ultimate questions at all . . . these questions are only raised by the narrative of the Creation
in the Old Testament, but not by the truth of the Biblical account of Creation” (p. 33).

Swaim (1953) pragmatically concludes,

There is no use in saying that we do not like the changes thus forced upon us . . . Regarding a fresh revelation of God’s truth, the question never is whether we like it, but only how soon we shall make it a part of our life and thought. (p. 164)

Historians note that there were great movements in biblical interpretation which sometimes lasted for centuries. Then society changed and new ways of interpretation arose. Interpretation follows need. Each age has tried to make the Bible relevant and no doubt new approaches will be seen in the future (Fischer, 1982, pp. 22-23). In this manner the Bible is a living book. No final and definitive statements can claim to explain it in all of its fullness. This historical perspective can be helpful to contemporary Christians who find new interpretations so threatening for they can see that such change and reinterpretation has been the norm down through the ages.

Dobzhansky (1967) states that an evolution of religion is not incompatible with possession of permanent and universal verities. The seeming incompatibility arises because of the failure to distinguish between what is permanent and universal and what are merely historical accretions in religious teachings (p. 111). James (1956) observes that religious history demonstrates how "one hypothesis after another has worked ill, has crumbled at contact with a widening knowledge of the world, and has lapsed from the minds of men. Some articles of faith, however,
have maintained themselves through every vicissitude, and possess even more
vitality today than ever before" (p. xii).

Many devout people have been able to integrate their faith and the data
from science into a tenable belief system. They find a creator God who is not
contradicted by his creation. Their reasoning is based upon a non-literal
interpretation of the Scriptural account of creation. Within the Protestant
community most of these people affiliate with the mainline denominations.

Simpson (1952) asserts,

If this world is not God's world, even the most frenzied arguments
could not make it so. But if it is God's world, we do not need to be
afraid of anything it actually reveals. All life is growth, and in
growth there are often growing pains. But these are profitable. It is
not the man of faith but the man of secret doubts, which he is trying
to smother, who will be afraid of unfamiliar facts and will try to
drown them out with clamor. Whoever really believes that he is
moving in God's world will go forward steadily to meet even its
dismaying revelations. (p. 462)

Lane (1923) believes that "the mutual distrust existing between science and
scripture is fatal to her" (p. 206). He quotes philosopher Paulsen who says with
reference to Scripture,

The proper attitude for her, however, does not consist in always
accepting the scientific and philosophical theories. What I offer, she
must say, is valid, whether Copernicus or Ptolemy, Darwin or
Agassiz, is right. The gospel is and has no system of cosmology and
biology; it preaches the kingdom of God which is to be realized in
the heart of man. (p. 206)

Van Till (1989) suggests a means by which the confusions between the data
of science and faith may be clarified. First is the world picture. This is a set of
particular concepts about the contents and behavior of the physical world. World pictures are not concerned with ultimate matters of religious import and they are not permanent. For instance, in the 16th century the work of Copernicus and Galileo brought about revolutionary changes in the prevailing world picture. The heliocentric solar system world picture replaced that of a geocentric cosmological picture. Scientific breakthroughs periodically require adjustments of world pictures. The data of evolutionary science have precipitated world picture change in many Christians.

World views, on the other hand, are a set of fundamental beliefs concerning the nature of reality. They concern the identity of an interrelationship among God, mankind and the rest of the world, and provide a framework and a context in which a person deals with questions of meaning and significance. A Christian world view would include, among other precepts, the following: There is one God. He is the Creator of everything else. Every other being or thing has the status of creature within the Creation.

As the Creation, the entire universe and all of its inhabitants are completely dependent on God for their existence, for their governance, for their value and for their purpose. This doctrine of creation expresses with strength and clarity the oneness of God, the distinction between Creator and Creation, and the Creation's complete dependence on God for all things at all times. (Van Till, 1989, p. 12)

Obviously Christian world views are distinctive and can be contrasted with other world views.
Van Till continues by contrasting a Christian world view with a Christian's faith. "To have a world view is to give assent to a set of statements. To have faith, however, is to make a personal commitment, to entrust one's self to the ultimate reality that is envisioned in a world view" (p. 12). Smith (1979) amplifies the definition of faith calling it "an engagement; the involvement of the Christian with God and with Christ, and with the sacraments and with the moral imperatives and with the community" (p. 5). The world view and the faith of the Christian remain stable and unwavering. The world picture is vulnerable to change and evolutionary theory has resulted in world picture modification in many Christians.

Because science educators were so seriously challenged in the courts in recent decades by fundamentalists who either wanted evolution out of the classroom or creation science in the classroom, they, along with other concerned citizens, have formed the National Center for Science Education, Inc. in Berkeley, California. This organization publishes explanatory pamphlets and reviews of creationist books as well as a journal, all of which help teachers, parents, and others assess creationist claims. There is a textbook program, a teacher training program, and a grassroots organization of dedicated citizens who are active on the local level.

Creationist Research vs. Evolutionist Research

A major distinction in how creationists and evolutionists do research is that the former have an a priori belief and they seek substantiation for it and tend to
ignore the data which negate the a priori belief. Theoretically the latter begin with no presuppositions, look for data open-mindedly, hypothesize on their merits alone, and follow where the data lead.

Gould (1994) notes that while science is supposed to be an objective enterprise, with common criteria of procedure and standards of evidence, it also is influenced by social preconceptions and biased modes of thinking. "The stereotype of a fully rational and objective 'scientific method', with individual scientists as logical (and interchangeable) as robots, is self-servin fantasy" (p. 14). To be sure, scientists are not perfect, but they are regularly challenged by and must answer to the rest of the scientific community if their conclusions are not correct or their methods faulty. Presumably the peer review sooner or later would expose defective research design, inaccurate data, or erroneous conclusions. The point is well made, however, that no human endeavor is free from all error. Hammond and Margulis (1981) maintain that "it is not facts or theories that are essential to the growth of science but rather the process of critical thinking, the rational examination of evidence, and an intellectual honesty enforced by the skeptical scrutiny of scientific peers" (p. 57).

Weinberg (1992) states that creationist authors stress selected arguments that support a preconceived belief and do not deal with other data which would contradict their thesis (p. 29). Spieth (1992) accuses a creationist author of ignoring large portions of relevant scientific literature and distorting and misrepresenting other parts (p. 45). Judge Overton (1982), who presided at the
aforementioned Arkansas trial, asserts that the creationist methods do not take data, weigh them against the opposing scientific data, and thereafter reach conclusions. . . Instead, they take the literal wording of the book of Genesis and attempt to find scientific support for it (p. 939). Van Till (1986) charges the creation science community with uncritically accepting data and drawing extrapolations without restraint thus clouding the credibility of the Christian witness to a scientifically knowledgeable world (p. 164). Wakefield (1988) accuses a creationist of making false conclusions because of preconceived ideas which blinded him to important facts and an unjustified expectation of what the data should show (p. 161). Skehan (1983), a geologist also trained in theology, states,

Creationism does a disservice to both science and religion since it rejects or ignores the vast body of scientific scholarship on the early history of the earth and Universe, as well as the great body of theological and archeological research on the early books of the Bible. (p. 307)

Siegel (1984) notes that another methodology of creationists is to defend creationism by criticizing evolution, "as if the untenability of the latter insured the correctness of the former; a confusion between falsifiability and falsification (i. e., between evolution's being capable of failing tests versus its actual failing of them)" (p. 350). Siegel also indict creationists for their lack of any positive research agenda. In the decade since he wrote some research projects have been commenced, and it remains to be seen what their contributions will be.

Donaldson (1988) summarizes the differences between evolutionary science and creationism: "True science asks: 'What theory of origins best accords with the
Creation science, in effect, asks: 'What theory of origins best accords with Genesis?'” (p. 110).

Evolution's Unanswered Questions

Part of the reason those with creationist belief have enjoyed success is that there remain significant and unanswered questions with respect to evolution. Seven such questions asked by creationists and others will be here identified. Many more are included in creationist literature such as Davis and Kenyon (1984).

The first concern is the incompleteness of the fossil record. Paleontologist Carroll (1988) explains with reference to animals that "perhaps no more than one in a million are so quickly buried that they may become fossilized" (p. 2). This certainly makes it difficult to obtain a complete picture of the progression of speciation. Serious perplexities result which in some cases probably never will be resolved, such as the rarity or absence of transitional forms in the fossil record. "The early stages of vertebrate history are poorly known, and significant gaps still separate many major groups" (p. 2). On the other hand, many gaps have been filled to a greater or lesser degree such as the hard-shelled clams, rhinoceroses, and apes as well as between reptiles and mammals (Pierce, 1981, p. 81). Cain (1988) makes a strong case for mammalian origins from synapsid reptiles, an excellent example of evolutionary transition (pp. 94-105). Cain specifically answers creationists' claims against the lack of transitional forms.
Some significant specimens of intermediates in whale evolution have been very recently reported (Pobojewski, 1994, p. 36) and a series of fossil mollusk species from northern Kenya has been discovered which details the steps of evolution from one species to another. Extensive and stratified deposits of a floodplain and delta offer a rare opportunity to follow the morphological changes in transitional fossil species over several million years. Many changes took place in relatively short periods (between 5,000 and 50,000 years) and therefore the data support the punctuated equilibrium model (Lewin, 1981, pp. 645-646).

Data pertaining to conditions of the early Earth do not arrive quickly and the story is by no means complete or entirely coherent. The reality is that conclusions will always be formed on the basis of some data which cannot be empirically proved for the universe is nonrepeatable. Controlled experiments cannot be designed for stars, planets, galaxies, and extinct species.

Clark (1984) explains that gaps do remain but it is "hardly surprising when one remembers that although the coelacanth, the 'fossil fish' of which a specimen was found living in 1938, has been in existence for 100 million years, and not a single coelacanth fossil has been discovered" (p. 320).

Paleontologists have some theories which might explain the lack of transitional forms in the fossil record. One is that of punctuated equilibrium whereby changes are thought to occur extremely rapidly at the time of the initiation of a new species, while most of their history passes with little change (Carroll, 1988, p. 570). The rapid change period would not afford the array of
fossils. This is in contrast to Darwin’s gradualism which would result in a continuum of change and should be supported by the fossil record.

Carroll cites work by Dobzhansky, Mayr, and Simpson, concluding:

The hazards of preservation and subsequent exposure impose another bias—against groups of animals that were rare or geographically restricted. This bias is particularly unfortunate, since most major evolutionary changes probably occurred in small, isolated populations that were subject to stringent selection pressure. Where information regarding transitional forms is most eagerly sought, it is least likely to be available. (p. 4)

A second concern to creationists as well as paleontologists is the lack of information which accounts for the rapid evolution that characterized the early diversification and radiation of groups. The great longevity of many groups and the minor evolutionary changes they exhibited poses a third problem (pp. 4-5).

A fourth concern is speciation, which needs more explanation (Mayr, 1957, pp. 371-388). Some insight into this phenomenon, as well as the second concern above, is given by Volpe (1985) who relates Carson’s findings of 26 species of picture-winged flies inhabiting the island of Hawaii in the Hawaiian Islands. The geologically very recent islands, formed by volcanic action, are less than 700,000 years old. Carson has inferred by analysis of chromosomal inversions that each of the species arose from ancestors which arrived at different times from other islands. After each colonizing event, distinct species have been formed. The migrant populations gave rise to new species rather than simply to new colonies of the parental species in an amazingly short geological period of time. The speed of
formation of new species of flies is of particular interest to evolutionary biologists and provides an example of organisms that indeed change very quickly (p. 234).

A fifth question concerns organs of extreme perfection and complication, such as the eye, which continues to confound those who struggle with evolutionary theory. Of what survival benefit is a half-formed eye? Vold (1985) presents three possible explanations, as set forth by Mayr, which may answer that question.

One possibility is that the new structure is a byproduct. That is to say, a genetic change which allows an organism to fit a particular environment may have an unrelated consequence. Unexpectedly, as it were, the particular structure in question emerges, e.g., sensitivity to light. Another possibility has it that the change may increase the ability of an organism to do what it already is doing. For example, perhaps an organism which has always had some sensitivity to light would be better served if that sensitivity were intensified; natural selection, then, culminates in the development of the eye. Finally, Mayr tells us that a structure might evolve which serves one function but turns out to serve another function as well—or better. Perhaps winglike front legs provided 'almost bats' with some advantage even while they remained grounded. Then, . . . these winglike front legs developed further and became useful for flight. (p. 165)

Paley (1992) observes, however, with respect to auxiliary structures of the eye:

In order to keep the eye moist and clean . . . a wash is constantly supplied by a secretion for the purpose; and the superfluous brine is conveyed to the nose through a perforation in the bone as large as a goosequill. When once the fluid has entered the nose, it spreads itself upon the inside of the nostril, and is evaporated by the current of warm air, which, in the course of respiration, is continually passing over it. . . . It is easily perceived, that the eye must want moisture: but could the want of the eye generate the gland which produces the tear, or bore the hole by which it is discharged—a hole through a bone? (p. 39)
Lane (1923) answers, "Any eye specialist can point out numerous ways in which the structure of the eye, wonderful as it is, might be improved to serve better its assigned function. In fact, every pair of eye-glasses bears mute testimony to this fact" (p. 31). Lane suggests that if the eye were created spontaneously, rather than having evolved, it would not be imperfect.

What of the giraffe's height? How have its many adaptations to height developed? It needs uniquely adapted arteries, veins, and blood pressure controls. How did these multifunctional adaptations occur (Davis & Kenyon, 1989, pp. 12, 13, 69-71)? These questions challenged Darwin as well. Some ask how the evolution of the sexes is explained? The genesis of gender is not understood but is an area of active research with several hypotheses being pursued (Sagan & Margulis, 1985, pp. 16-25).

A sixth factor which has hindered some from accepting the data of the scientific community is that scientists in the past have accepted some data as truth which have subsequently been proven false. Many of the books written by creation scientists "consist in large part of discussions of the supposed errors of evolutionary teaching" (Hyers, 1985, p. 413). In 1923, Lane wrote of the find in 1912 of a very ancient man, Eoanthropus dawsoni, found in the plateau gravels at Piltdown, near Fletching, in Sussex, England. The skull is carefully described and the human it represented introduced as being of higher type than any that preceded him, and, quoting Schuchert, Lane says this man was a "primitive slayer, though keener than any of his animal associates and was destined through the manufacture of better
implements to become a hunter of higher order" (p. 74). While this skull long puzzled anthropologists it wasn't until 1953 that scientists proved that the fossil was a hoax with an upper skull of a human and a jaw of an ape. This deceit was apparently perpetrated by an amateur biologist who claimed the discovery of a missing link (Moore, 1962, pp. 132-133). Creationists are quick to point out such deceptions of the past and they conclude it is a matter of time until present evolutionary belief is also disproven. Scientists regret the length of time it took to expose this falsehood but they note that it was the scientific community which identified and corrected the error, which is how science works.

Since parts of the theory will never be empirically demonstrated, and parts will continually be refined or disproven, there will be room for perpetual challenge by those who seek to look for weaknesses yet fail to acknowledge the overwhelming evidence that points toward the evolutionary process.

It must also be noted that creationists have published data which have been subsequently proven inaccurate such as their analysis of the "simultaneous occurrence" of dinosaur and human footprints in Cretaceous limestone near Glen Rose, Texas. Milne and Schafersman (1983), in a detailed response to the creationist claim that human and dinosaur footprints occurred together, state "creationist 'study' of the Paluxy tracks has been careless, amateurish and inconsistent." References are cited inaccurately and there are internal inconsistencies with both elementary and major errors identified. Koballa and Montague (1985) state, "Claiming that the tracks are evidence that dinosaurs and
humans lived at the same time, creationists fail to mention the extensive work of vertebrate paleontologists with fossil trackways, showing that the dinosaur footprints are real but the 'human footprints' are not" (p. 28).

Koballa and Montague also mention Gish's reference to the absence of fossil evidence for angiosperms in his book *Evolution? The Fossils Say No!* published in 1978. In 1976 several botanists revealed in published accounts the then recent findings of primitive angiosperm fossils. Gish either ignored this evidence or was not familiar with the current literature on this subject.

Finally, one of the most pervasive assertions made by creationists is that evolutionary theory runs counter to the Second Law of Thermodynamics or entropy law (Morris, 1977, p. 8) which states that the amount of order in a closed system cannot increase spontaneously. They fail to distinguish between closed systems, in which the second law operates, and open systems, in which evolution operates.

A living cell no more violates the second law than a General Motors assembly plant does. An assembly plant increases the order in the parts of a car by putting them together. It does so by using energy from the outside in conformity with the second law. A living cell increases its own order by using energy from outside the cell. (Vogel, 1984, p. 3)

Few people are capable of recognizing the fallacy of these statements of physics or are aware of the other inaccuracies perpetrated by creationist authors which persist for years and which are not acknowledged nor are corrections published.
Toffler (1984), in the introduction to Nobel winning physicist Prigogine and Stenger's book, states that the authors also undermine conventional views of thermodynamics by showing that, under nonequilibrium conditions, at least, entropy may produce, rather than degrade, order, organization—and therefore life. If this is so, then entropy, too, loses its either/or character. While certain systems run down, other systems simultaneously evolve and grow more coherent. This mutualistic, nonexclusive view makes it possible for biology and physics to coexist rather than merely contradict one another. (pp. xxi-xxii)

"It must be understood that Darwin's theory and all the others which have been advanced in explanation of the method of evolution may prove inadequate or even incorrect without in the least affecting the standing of the evolutionary idea itself" (Lane, 1923, p. 26). Darwin's theory of natural selection has been found to be inadequate to explain all the facts and phenomena of evolutionary change. Gould and Eldredge's punctuated equilibrium theory (Gould, 1993, pp. 223-227) helps interpret what may have been operating. There are, without doubt, other still unknown explanations. Paleontologist J. R. Horner (personal communication, October, 1993) asserts, "That evolution happened is clear. What is not clear are its mechanisms."

Science Defined

The fact that many pastors and theologians as well as church members have not been trained as scientists exacerbates this dilemma. The scientific method is difficult to define, for rather than a method it is a state of mind, a complex set of assumptions.
The key ideas are that most, if not all, things and events can be understood in terms of identifiable physical forces, and that the best way to identify and measure those forces is to conceive ideas and then expose them to rejection through scientific experimentation. (Wenke, 1984, p. 12)

While this sounds reasonable to most in the 20th century, history shows that it is a rather late and rare perception of the world. As Wenke states, "For most ancients and for many moderns, the world swarms with phenomena and forces that can never be understood by science" (p. 12).

Science uses scientific method which begins with a hypothesis which is then tested by experimentation, using controls for variables; data are collected and interpreted and a conclusion is drawn based on the data. The research procedures are published, open to review, repeatable, and falsifiable.

It is not well understood that science exists to disprove and it constantly does so as truth is tenaciously pursued. Darwin states in his autobiography

I have steadily endeavored to keep my mind free, so as to give up any hypothesis, however much beloved (and I cannot resist forming one on every subject), as soon as facts are shown to be opposed to it. Indeed I have had no choice but to act in this manner, for with the exception of the Coral Reefs, I cannot remember a single first-formed hypothesis which had not after a time to be given up or greatly modified. (Barlow, 1958, p. 87)

Einstein claimed, "No fairer destiny could be allotted to any physical theory than that it should itself point out the way to introducing a more comprehensive theory in which it lives on as a limiting case" (quoted in Popper, 1956/1983, p. 131). Scientists attempt to establish new relationships among principles already known. They strive to understand the pattern of nature, some of which is not yet
fully demonstrated. In this process, previously held theory is regularly negated.

That is the nature of the scientific process.

When we have put forward an idea or a theory in science, our object must not be to preserve it by seeking everything that may support it and setting aside everything that may weaken it. On the contrary, we ought to examine with greatest care the facts that would overthrow it. (Bernard, 1865, p. 40)

Scientists must see paradigm change as progress (Kuhn, 1970, p. 169). Science is a progressive, tentative activity and what is new and correct today may be later proven to be incomplete or just plain wrong (Lewin, 1989, p. VI). A weakness is not revealed when science is disproven but its strength is demonstrated as it clarifies truth.

Popper (1979) explains the importance and purpose of careful assessment of theories.

For our critical examination of our theories leads us to attempts to test and to overthrow them; and these lead us further to experiments and observations of a kind which nobody would ever have dreamt of without the stimulus and guidance both of our theories and of our criticism of them. For indeed, the most interesting experiments and observations were carefully designed by us in order to test our theories, especially our new theories. (p. 7)

Many people are not informed as to what scientists mean by a theory.

While a theory is not proven fact, it is more than a guess or hypothesis.

Theory both accounts for what one observes and constitutes the parameters within which one perceives reality. A good theory accords unity to one's observations while supplying problem-solving strategies that open new realms of inquiry. The alternative to theory is chaos; we would not even know which questions to ask. Naturally, any given theory may lack sufficient explanatory force either to establish it in the first place or to maintain it in the long run.
Evidence might be uncovered which contradicts it and leads to its eventual rejection. But theory is the starting point for all meaningful scientific activity and Darwin's theory of evolution ranks among history's most profound. (Vold, 1985, p. 162)

Brand (1987) describes theories as "valuable, practical tools, but that does not mean they are absolute truth. They may be only stepping stones in our search for truth" (p. 22). He characterizes a good scientific theory as being able to (1) explain and organize previously unrelated facts, (2) suggest experiments and stimulate progress, (3) be testable, and (4) predict the outcome of untried experiments (p. 22).

Many bodies of knowledge are termed theories, yet they represent much validated information. The Germ Theory of Disease, Atomic Theory, and the Theory of Gravity are examples. To describe any of these disparagingly as "only a theory" betrays an ignorance of what the scientist means by theory.

A further consideration which impacts the issues is that congregants in most churches are generally not familiar with the accumulated body of data which does exist that supports evolutionary theory. They do not have time or inclination to originally think on this subject and some are not encouraged or trained to critically think on questions pertaining to faith and life. Some are fearful of being exposed to the support for evolutionary theory. Often they only hear the extreme opinions of evolutionary naturalists such as Sagan, Dawkins, Monod, Rachels, and Gould, and then only partially. As a result, they have accepted positions promulgated by well-meaning pastors, seminary instructors, or other authorities whom they trust.
Unfortunately, a sincere, devout, and intelligent authority on faith and theology is not always qualified as an authority in science. Science educators take some responsibility for the confusion which exists among lay people, and even clergy, on this subject. Pierce (1981) quotes Moyer of the National Association of Biology Teachers who admits "we have done a botched job of teaching evolutionary theory" (p. 82) and chemist Doolittle who states, "The tragedy of it all is the state of science education in the country--it's simply, sadly, awful" (p. 82).

In other situations scientists are also largely to blame for the confusion as they have not always been careful to make clear distinctions between their scientific facts and their philosophical deductions. Some have taken delight in deriding the doctrines of the Christian religion and this has offended and alienated the devout (Lane, 1923, pp. 2-3). Eiseley (1946) suggests that scientists have been guilty of taking

the unwary reader by a hop, skip and jump from the little steaming pond or the beneficent chemical crucible of the sea, into the lower world of life with such sureness and rapidity that it is easy to assume that there is no mystery about this matter at all, or if there is, that it is a very little one. (1946, p. 199)

In turn, when a pastor assumes the role of expert in science, he or she may be responsible for misinformation, misinterpretation and, unknowingly, outright deception.

The primary basis, however, for the rejection of modern evolutionary theory is that when the Scriptures in Genesis chapter one are interpreted in a literal
fashion, there is overpowering support for the creationist belief from that acknowledged authentic source. There is no alternative but to believe the creationist model when the Scriptures are read unquestioningly and literally.

The Identity, Origin, Purpose, and Interpretation of the Bible

Introduction

For the Christian, there are two sources which provide information concerning the origin and history of the universe, of Earth, of life, and of subsequent species of plants and animals including humans. One of these sources is the Bible and the other is the natural world, including the rocks of the Earth, the surrounding cosmos, and the actual living forms present. A Christian's faith and commitment to the Bible as God's word demands that its witness be investigated and a Christian's inquiring mind demands the examination of the record in nature, God's work. If God is the author of the Bible and if God is the creator, then these two sources ought to substantiate and confirm one another. If they appear to contradict one another it would follow that one or the other is not being read correctly or perhaps both are being inappropriately interpreted.

The story which is written in the rocks, in the cosmos, and in nature is read and interpreted by scientists in such fields as geology, paleontology, astronomy, physics, molecular biology, genetics, biogeography, and mathematics. While these disciplines have developed immensely during the past century and much information can now be clearly deduced from the data of strata, fossils and rock
types, stars, galaxies, space, planets, the biochemistry, genetics, and anatomy of living forms, and the distribution of species, there remain a multitude of questions, and many of the mysteries in the natural world will perhaps never be fully explained.

The other source for information on origins is written in the Bible which is read and interpreted by Jews, Christians, and a host of other inquirers. Biblical scholars who diligently seek to understand its truths are found in all of these groups. This record is also difficult to apprehend.

There is a popular misconception abroad that the Bible is an easy book to understand. Anyone, however, who has come to this collection of various pieces of literature with any degree of seriousness has discovered that this idea is totally unfounded! Far from being an easy book to understand, the Bible appears to many as an inscrutable and forbidding mountain, totally strange and foreign, the face of which simply cannot be scaled. (Efird, 1982, p. 1)

Buttrick (1952) expresses the difficulty associated with understanding the Bible in suggesting that its "gold is given sometimes in nuggets, as in the 23rd Psalm or the Sermon on the Mount; but more often it comes in ore to be dug, smelted, and refined" (p. 165).

The Bible was written in a pre-scientific culture totally different from ours with a whole different world-view and set of assumptions about the nature of the natural world and about the relation (or lack of it) of cause and effect. (Easton, 1957, p. 34)

Adler and Van Doren (1972) state, "There have been more books written about how to read Scripture than about all other aspects of the art of reading together. The Word of God is obviously the most difficult writing man can read" (p. 294).
The Bible can be especially perplexing for modern, sophisticated and educated people who have been immersed in the contemporary scientific world view. The major critical issue is how to interpret this history.

It is suggested that much of the confusion which has arisen between science and the Scriptures with regard to evolution has been generated because neither the science nor the Scriptures have been well researched and understood by those who seek to defend one side and attack the other. Alexander (1986) asserts, "Most of us are both scientific and religious illiterates" (p. 295). Alley (1982) agrees:

Most Americans seem prepared to accept the Bible as some type of authority, but their general ignorance of its nature and content leaves them susceptible to manipulation by persons claiming a corner on the knowledge of both... The result is an ignorant flock. (p. 5)

It is essential that the identity and origins of the Bible are here included and the bases identified upon which its authority is grounded. Above all, the various means by which it is interpreted must be delineated and explained. Presumably, when both the biblical and natural records are read correctly, the uneasy relationship between the evolutionists and the creationists may be somewhat ameliorated.

Identity of the Bible

The word "Bible" derives from the Greek "ta biblia" which means "The Books" (Beare, 1962, p. 407). It consists of a library of 66 books written over a period of more than a millennium by numerous authors, some
known and some unknown. These writers inhabited the general region presently known as the Middle East. The Bible is often called the Holy Scriptures and it contains two testaments or covenants: the Old Testament, originally written in Hebrew, which covers almost two thousand years of ancient Hebrew history; and the New Testament, originally written primarily in Greek, which began to be written during the latter decades of the first century A.D. and was completed around 200 A.D. (Foreman, 1959, p. 7).

What is presently referred to as the Old Testament was the official collection of the holy scriptures of the Jews before becoming the first testament of the Christian Bible. The present Hebrew Scriptures have a different organization than the Protestant Christian Old Testament but they are identical in content. There are differences, of course, in how the Jewish and Christian communities exegete these Scriptures. The Catholic Bible contains additional writings called the Apocrypha which have been included as part of the Old Testament.

The Old Testament was translated into Greek during the last two and a half centuries B.C. in Alexandria, Egypt (Pfeiffer, 1962, p. 499). The New Testament covers the events of the first century A.D., including the life of Jesus and the establishment of the Christian church. For Christians, the New Testament expresses the fulfillment of the prophesies and hopes of the Old Testament and is a continuation of God's revelation to humankind. "The Old Testament is interpreted by the New, and the New is understood through the Old, but the unity of its witness is grounded in the One Lord" (Childs, 1979, p. 671).
Translating the Bible from its original Greek and Hebrew so that it has meaning in the language and culture of the contemporary world has been a formidable challenge. The Hebrew in which the Old Testament was written was never widely spoken and today is known by comparatively few. The Greek of the New Testament was the universal language of the most civilized part of Europe and the Mediterranean world during that era but it has changed greatly and has become a minority language (Foreman, 1959, p. 7). "The attempt to translate an ancient language into a modern one always runs into troubles, for no language can ever bring out precisely what is said in another, though the general meaning may be quite clear" (p. 8).

None of the original manuscripts of the books of the Bible have survived. Ancient copies are available, however, and scholars generally agree that the English translations from them are quite accurate. It is important to remember that the English Bible is a translation, and cannot be the exact words of any of the biblical authors. The first English translation from Latin was completed by Wycliffe and his colleagues in 1382. The Hebrew and Greek manuscripts were not known to Christians until they were discovered in the Renaissance. Tyndale's version was available in 1525. In the years which followed, additional editions were completed including the Geneva Bible, brought to America by the pilgrims. Later came the King James Bible of 1611 (Swaim, 1953, pp. 32-33). Since language is constantly changing and finality is not to be looked for in versions, translation is a labor that necessarily must be done afresh for each succeeding age.
Along with the change in word meanings within a culture over the years, words in different languages do not have precise equivalents and this adds to the challenge and frustration for the translator. An excellent example of this evolution of word meanings is illustrated later in this paper in reference to faith and belief.

There are numerous English translations of the Bible presently available. Translators regularly incorporate the latest scholarship using newly discovered manuscripts and update the language using modern English so that readers can understand the Bible in their specific culture.

Since the Bible was written over a period of a thousand years by numerous authors of an entirely different culture some two to three thousand years ago, the difficulty in arriving at an accurate understanding of some of its precepts is compounded. The original purposes of these writings and the people to whom they were first directed must be thoroughly researched in order to understand their original message.

The Biblical writers were primarily, indeed exclusively, concerned with religion—with making known the ways of God to man. Consequently if the Bible is to be read aright, it must be read religiously. This is what is meant by saying . . . that in it we hear God speak. (Easton, 1957, p. 36)

Most would agree that the Bible was not written to be a book of science. Even Jonathan Edwards wrote, "The design of the Scripture is to teach us divinity and not physic and anatomy" (quoted in Swaim, 1953, p. 127).

The Scriptures which refer to creation are primarily found in the Old Testament, and therefore the Old Testament will be the focus of the present
discussion. There are references in the New Testament to creation and many are included in Appendix D along with additional references from the Old Testament.

The actual writing of parts of the Old Testament took place from ca. (circa) 1150 B.C. (the Song of Deborah, Judges 5) or a little earlier (some poems and laws) to ca. 125 B.C. (the book of Esther) or a little later (Psalm 2) (Pfeiffer, 1962, p. 500). Before being put into written form, the Old Testament was part of an extensive oral tradition in the Hebrew community for countless generations.

The Old Testament authors' ancestors were from the desert Semitic tribes of Sumer (modern Iraq) who invaded Canaan (Palestine) in the first half of the second millennium B.C. They followed a patriarch, Abraham, who felt called to a new land to begin a new nation of people (Genesis 12:1-4). Israel's origin was nowhere near the dawn of history. There were records of earlier cultures thousands of years previous to their organization (Bright, 1959, pp. 17-18). Mulder (1989) states, "The origin of the people of Israel and of their name is a matter about which we are completely in the dark" (p. 7). Not until the 13th century B.C. can a history of Israel begin. Before that they were seminomadic wanderers, unattested by contemporary record and leaving no tangible trace of their passing (Bright, 1959, p. 41).

After a period of wars, famine sent the Israelites to Egypt where they were enslaved. Sources disagree on the dates but they finally re-entered Canaan, the Promised Land, somewhere around the 14th to 12th centuries B.C. (The New Revised Standard Version of the Bible, Introduction, 1989). Their conquest was
achieved and eventually, ca. 1000 B.C., King David, followed by Solomon, established a short-lived empire. Solomon built the first temple ca. 950 B.C. and when he died the empire split into two kingdoms, Israel in the north and Judah in the south. By the seventh century, the Assyrians conquered Israel and the people were dispersed. In 587, Nebuchadnezzar destroyed Jerusalem and took the people into Babylonian captivity. The Persian King Cyrus returned the Jews to Palestine in 420, and they rebuilt the temple. Other groups conquered them in the following centuries, and finally they came under Roman control in 63 A.D. The literature of the Bible powerfully reflects these political vicissitudes (Severy, 1967, pp. 440-441).

The Bible was not shaped in isolation. It was always shaped and reshaped in serious confrontation between Israel and those, inside and out, who wanted to alloy her faith. Again and again, emerging events put new questions before Israel's memory and insisted upon fresh answers from the believing community. (Brueggemann & Wolff, 1975, p. 11)

Table 3 presents an overview of Israelite history.

Finegan (1962) describes one dimension of Israelite culture, helping moderns understand the setting in which the Bible developed:

There was science in the ancient world, for both the Babylonians and the Egyptians made important advances in such fields as mathematics, astronomy, geology, chemistry, and medicine. There was philosophy in the ancient world, for the Greek thinkers left all succeeding Western philosophers in their debt. But the Israelites . . . were not primarily scientific or speculative in their concerns. They were . . . deeply concerned with the mystery of existence, with the purpose and meaning of their history as a people, and with the meaning and purpose of the life of man. (p. 11)
Table 3. Time Scale of Israelite History.

<table>
<thead>
<tr>
<th>Date</th>
<th>Historical Event</th>
<th>Date</th>
<th>Historical Event</th>
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<tbody>
<tr>
<td>B.C.</td>
<td></td>
<td></td>
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<tr>
<td>1300</td>
<td>Exodus from Egypt, Moses; conquest of Canaan, Joshua</td>
<td>600</td>
<td>Ezekiel</td>
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<td></td>
<td></td>
<td></td>
<td>Babylonians sack Jerusalem</td>
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<td></td>
<td></td>
<td></td>
<td>Exile in Babylon</td>
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<td></td>
<td></td>
<td></td>
<td>Second Isaiah</td>
</tr>
<tr>
<td>1200</td>
<td>Invasion of the Philistines</td>
<td>1100</td>
<td>Cyrus begins Persian Empire</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Haggai and Zechariah</td>
</tr>
<tr>
<td>1100</td>
<td>Deborah</td>
<td>500</td>
<td>Second temple built; Nehemiah rebuilds Jerusalem</td>
</tr>
<tr>
<td></td>
<td>Saul founds monarchy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1000</td>
<td>David rules United Kingdom</td>
<td>400</td>
<td>The Law accepted as Scripture</td>
</tr>
<tr>
<td></td>
<td>Solomon rules United Kingdom</td>
<td></td>
<td>Alexander conquers east</td>
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<tr>
<td></td>
<td>First temple built</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Division of Kingdom</td>
<td>300</td>
<td>Egypt rules Palestine</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>The Prophets accepted as Scripture</td>
</tr>
<tr>
<td>900</td>
<td>Asa King of Judah</td>
<td>200</td>
<td>Syria rules Palestine</td>
</tr>
<tr>
<td></td>
<td>Ahab King of Israel</td>
<td></td>
<td>Maccabees</td>
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<tr>
<td></td>
<td>Elijah</td>
<td></td>
<td>Hasmonean rulers</td>
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<td></td>
<td>Elisha</td>
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<tr>
<td></td>
<td>Jehu's revolution</td>
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<tr>
<td>800</td>
<td>Jehoash King of Israel</td>
<td>100</td>
<td>Romans conquer Palestine</td>
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<td></td>
<td>Jeroboam II King of Judah</td>
<td></td>
<td>Herod the Great</td>
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<tr>
<td></td>
<td>Amos</td>
<td></td>
<td>Third temple built</td>
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<tr>
<td></td>
<td>Assyrians take Samaria</td>
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<td></td>
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<tr>
<td></td>
<td>Isaiah</td>
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<tr>
<td></td>
<td></td>
<td>A.D.</td>
<td></td>
</tr>
<tr>
<td>700</td>
<td>Hezekiah King of Judah</td>
<td></td>
<td>Jesus’ ministry</td>
</tr>
<tr>
<td></td>
<td>Manasseh King of Judah</td>
<td></td>
<td>Paul’s ministry, letters</td>
</tr>
<tr>
<td></td>
<td>Zephaniah</td>
<td></td>
<td>Gospel of Mark written</td>
</tr>
<tr>
<td></td>
<td>Josiah’s reform</td>
<td></td>
<td>Romans destroy Jerusalem</td>
</tr>
<tr>
<td></td>
<td>Jeremiah</td>
<td></td>
<td>The writings close OT canon</td>
</tr>
<tr>
<td>100</td>
<td></td>
<td></td>
<td>Last NT books written</td>
</tr>
</tbody>
</table>

(Buttrick, 1962, inside front cover)
During the historical era when first the oral and then the written traditions occurred, the primary questions were not whether a god or gods existed but what kind of a god was he and what did he (they) require? The gods all had names and the God of the Hebrew people was called Yahweh which became Jehovah (Efird, 1982, p. 2).

The Bible is one of the oldest books in the world, and it is also one of the newest. It is old; for the latest parts of it were written 1,800 years ago, and much of it hundreds of years before that. But it is new; because it is read with new interest continually by living men, and in its old pages new needs are freshly met. (Bowie, 1934, p. 15)

The Bible is not a safe book if you are looking solely for consolation. It is too authentically human to allow an escape without a response. It is a disturbing book when it asks us to join the human race and confront ourselves. It even asks us to confront the God who is presented in its pages (Fischer, 1982, pp. 4-5).

The Bible is a perpetual best seller "averaging thirty million copies a year--perhaps one hundred and fifty billion in all since Gutenberg invented the printing press in 1453 and made the Bible his first project" (Boadt, 1984, p. 11). It has been read by more people than any other book, having been translated in whole or in part into several thousand languages and dialects.

Why is this book which is difficult to read, overwhelming in length, and written by people who have long disappeared still in such demand? Without doubt it is because the Bible deals with the great questions of life:

Where did we come from, and where are we going?

What does life mean, and what should we do with it?
What is wrong and what is right?
Who is God, and where shall we find him?
How can I live and die happily? (Bowie, 1934, pp. 15-16)

The experiences of the biblical characters parallel our experiences. The questions they asked are our questions:

If a man die, shall he live again? (Job 14:14)
What do you think of the Christ? (Matthew 22:42)
Who are you, Lord? (Acts 9:5)
What shall I do, Lord? (Acts 22:10)
Why does the way of the wicked prosper? (Jeremiah 12:1)
Why are you cast down, O my soul? (Psalms 42:5)

To the extent that we really ask such questions we find ourselves involved with the search for their answers in the Bible. The men and women of the Bible got their answers in the blood, toil, tears and sweat of a tragic history. Answers emerged from the rough and tumble of life and it is in the rough and tumble of our lives that we discover how right the Bible's answers are. (Brown, 1955, p. 16)

All through the Bible runs a golden thread--the desire after God (Bowie, 1934, p. 16).

Animals, as far as we can tell, have no higher spiritual longings: they build no temples, confess no sins, offer no prayers, compose no hymns, and write no theologies. The human soul, on the other hand, has a depth and height of need and longing which only the quest for God can satisfy. (Munk, 1954, p. 20)

Throughout the Bible people seem bent on trying to escape from God. And in spite of this, God continues to seek after those same people, refusing to give up, continuing the pursuit in spite of countless rebuffs and evasions.
It has all the excitement and thrill of a detective story, in which the
detective relentlessly chases the criminal through chapter after
chapter. . . . The search culminates in the New Testament, where the
claim is made that God has so desired fellowship with man that
finally he has not just sent emissaries or ambassadors or prophets or
representatives—in Jesus Christ he has come himself. (Brown, 1955,
p. 15)

The same search is occurring today, Brown asserts, which is why the book
lives. The Bible is still a means by which God seeks us out today (p. 16).

Bultmann states:

It is the word of God which calls man away from his selfishness and
from the illusory security which he has built up for himself. It calls
him to God, who is beyond the world and beyond scientific thinking.
At the same time, it calls man to his true self. For the self of man,
his inner life, his personal existence is also beyond the visible world
and beyond rational thinking. The Word of God addresses man in
his personal existence and thereby it gives him freedom from the
world and from the sorrow and anxiety which overwhelm him when
he forgets the beyond. (Johnson, 1987, p. 303)

While other great and sacred books have sought to answer the questions of
origins, purpose, and destiny, many believe that the Bible comes closer to revealing
the answers than any of the others. It deals with real people: how they thought,
lived, blundered, doubted, trusted, believed. No one is left out. The wise and the
foolish, rich and poor, faithful and treacherous, the pitiful and the prosperous, the
innocent and the guilty, the spendthrift and the miser, the players of practical jokes
and their discomfited victims, the sorry, the tired, the old, the young, misled and
impetuous girls, young men who lusted and young men who loved, friends who
counted no cost for friendship, bad and good mannered children (Chase, 1944,
p. 5).
To enter into the world of ancient Israel as it is disclosed to us in the pages of the Old Testament is to enter the same world of human actions and motives, loves and hates, passions and sins, hopes and fears, as we ourselves know: the people and the situations which confront them are recognizable "everyman" and the situation of "everyman." This is one reason why the Old Testament can still come alive for—and speak to—the perceptive and receptive mind today. (Farmer, 1952, p. 8)

Little by little it reveals God through its stories.

And at last, out of all the lesser crowd, one great Person arises, splendid with God's shining—like some snow-clad mountain which, above the valleys still in shadow, stands crowned with the beauty of the risen sun. That one is Jesus. He is the climax of the Bible story. He is the final meaning which shows the partial meaning in all the rest. Looking at him and experiencing his spirit, men in every time have said, "This is what God must be like." (Bowie, 1934, p. 16)

"From the earliest period of its history the Christian church has regarded the Scriptures as being in some sense the special revelation of God, and therefore as being in some sense the final standard or norm of Christian truth" (Farmer, 1952, p. 3). Reformer Calvin exclaimed, "As far as Sacred Scripture is concerned, however much froward men try to gnaw at it, nevertheless it clearly is crammed with thoughts that could not be humanly conceived" (McNeill, 1960, p. 83).

People read the Bible because they are looking for God and they are looking for meaning. They believe God speaks through its words and that the words are inspired, having a divine or supernatural influence. "The grounds of its acceptance are its inherent spiritual power, the conviction it produced that it truly expressed the will of Jehovah, . . . The book was not imposed merely by royal authority; the people also 'stood to the covenant'" (Hastings, 1951, p. 112).
The Bible is also a sort of bridge, a channel, a telephone line, a wave length, along which the Word of God comes to us. The Bible conveys the Word from God to us. The Bible, moreover, becomes the Word in the sense that a sonata of Beethoven "becomes" music to the man who wakes up to it for the first time. Strictly speaking, the music does not change, it is what it always was; but one particular listener now hears what he once could not hear. Noise has become music. So the Bible, long a dead book to a non-reader, or even to a reader, may one day come alive, as the message from God to him. And when it does, it is the Word of God. (Foreman, 1959, p. 17)

Brown (1955) describes the Bible as a special delivery letter with each person's name on it. It is more than a record. It is a call, an invitation, an urgent message (p. 17).

The Bible is also respected for its profound influence on Western culture including its art, philosophy, literature, music, law, ethics, and language; from Michelangelo's frescos in the Sistine Chapel, the Durer and Rembrandt engravings, the music of Bach and Handel, the literature of Milton and Bunyon to democratic institutions, hospitals, universities, and the beginnings of modern science. All are unthinkable without the Bible (Houston, 1980, p. 148). The Bible placed an indelible stamp on writers from Bacon, to Lincoln, to Bunyon, Milton, William Blake, Whittier, T. S. Eliot, Emerson, Thoreau. "Without it the words of Burke and Washington, Patrick Henry and Winston Churchill would miss alike their eloquence and their meaning" (Chase, 1944, p. 9). Without a knowledge of it the best of much of our literature would be poorly understood and the development of characteristics of the English language would remain obscure.
To all English-speaking peoples the Bible is a national as well as a noble monument, for much of their history is securely rooted and anchored within it. In 17th century England it nurtured the Puritan revolt and paved the way for the Bill of Rights. In 17th and 18th century America it supplied not only the names of our ancestors but the stout precepts by which they lived. It was the source of the convictions that shaped the building of this country, of the faith that endured the first New England winters and later opened up the Great West. It laid the foundations of our educational system, built our earliest colleges, and dictated the training within our homes. In the words alike of Jefferson and Patrick Henry, John Quincy Adams and Franklin it made better and more useful citizens to their country by reminding a man of his individual responsibility, his own dignity, and his equality with his fellow-man. (pp. 9-10)

The Bible dominates much of modern religious thought, and includes the most complete history of the ancient past that we possess. Above all, it is believed by millions to be God's revelation (Boadt, 1984, pp. 11-12).

The Origins of the Old Testament

It is suggested that when pre-scientific human ancestors first demonstrated the possession of a higher reflective intelligence which is associated with being human and language developed, they began to ask questions, much as children ask questions as they progress in mental development. Where did we come from? What happens after death? How did the world begin? What is our purpose? Where does the sun go at night? From where does rain originate? From the beginning, humans wondered about the things that no one knew.

The world’s literature is littered with attempts to make sense of the past and to set forth the nature of culture, but few of these ideas have withstood the test of time. Ancient Middle Eastern views on this subject, especially as presented in the comparatively late form of the Old Testament, envisioned a static, created world in which great
changes came about through divine intercession, and where the ultimate explanation of events was God’s will. (Wenke, 1984, p. 10)

Most human societies have answers to these questions. The answers vary in detail but are remarkably similar among the various primitive peoples. People and the world exist because they were brought into being by a series of creative acts, usually by supernatural beings or forces. These accounts and explanations are known as origin myths. "Until the rise of modern science, origin myths provided the only kinds of answers possible to such questions. Thus, myths embodied the state and limitation of human thought about origins for more than 99% of human history" (Carneiro, undated). Myths are usually religious beliefs and the element of explanation gives them some scientific qualities. Science tests explanations and proves or disproves them whereas myths are accepted with no need for verification.

Perhaps the more gifted invented the myths in which some few, faint glimmerings of truth were almost hopelessly buried in superstition. "These myths contained strange mixtures of man’s imaginings, longings, dreams, vague memories, accounts of natural events greatly magnified together with legends of ancestral heroes, and authority" (Munk, 1954, pp. 33-34). Story-telling is one of the oldest cultural manifestations of man. Story-tellers invented hymns, chants, jingles, and tunes to assist the memory. The community would join together and listen to gifted story-tellers who may have had singers who could recite the story in verse (Diringer, 1982, p. 15).
Swimme (1993) believes the stories humans told around the evening fire for most of the last 50,000 years helped humans initiate their young into the universe. The rituals, the traditions, the taboos, the ethics, the techniques, the customs, and the values all had their core in a cosmic story. The story provided the central cohesion for each society. Story in this sense is "world interpretation"—a likely account of the development and nature and value of things in this world. (p. 110)

"Humans," he continues, "enter this world and awaken to a simple truth: 'We must find our story within this great epic of being'" (p. 111).

Barbour (1974) suggests that myth serves to accentuate our humanity. It addresses the meaning of human existence. "In broad terms a myth is a story which is taken to manifest some aspect of the cosmic order" (p. 20). Myths, he states, take into account the perennial problems confronting humans. Alexander (1986) shows how the Genesis myth, for example, speaks of weakness, awareness of good and evil, and relationship with a transcendent deity.

Taken symbolically, the myth reveals the creation's mystery and humanity, the sense that life can have a meaning that transcends the very real human world in which it is set. It speaks of the morality of relationships, of the goodness of honesty and trust, of the evil of lying and deceit. Taken literally, as a set of propositions, the myth loses its mystery and this moral force. It is reduced to a set of mundane statements about and justifying what is—and nothing more. (pp. 295-296)

Palmer (1992) explains that we all inhabit mythological worlds, interpreting "reality" by means of stories. We explain away uncomfortable issues such as "What are we?" and "Why are we here?" He credits Jung with pointing out that we create cosmologies in which we find a comforting or reassuring place, and if we didn't do
this we would be crushed by the sheer "awe-ful-ness" of the universe. Palmer suggests that the Genesis myth tells us more about the Hebraic understanding of their world than about the creation of life. "Now there is nothing in itself wrong with such storytelling. The problems come when we don't realize we are telling such stories and then the stories begin to exercise a control over us" (p. 2).

Niebuhr (1957) observed,

Religion had no right to insist on the scientific accuracy of its mythical heritage. From this position a retreat was necessary. That part of mythology which is derived from pre-scientific thought, which does not understand the causal relations in the natural and historical world, must naturally be sacrificed in a scientific age. (p. 89)

He further states that there is a permanent as well as a primitive myth in every great mythical heritage which deals with the supra-scientific rather than the pre-scientific and that permanent part must be preserved while the primitive part is sacrificed. Rue (1993) and Busse (1993) give additional insight into Christian myth.

Theologian Bultmann explains the myth as being "primitive science, the intention of which is to explain phenomena and incidents which are strange, curious, surprising, or frightening by attributing them to supernatural causes" (Johnson, 1987, p. 293). Mythological thinking has God residing up in Heaven. What does that mean? It expresses the idea that God is beyond the world, transcendent. For modern man, "above in the universe" has lost meaning but the idea of a transcendent God is still significant (p. 294).
The world view of the Scripture is mythological and is unacceptable to modern man whose thinking has been shaped by science. Bultmann explains that "the contrast between the ancient world-view of the Bible and the modern world-view is the contrast between two ways of thinking, the mythological and the scientific" (p. 301). He strongly believes:

To de-mythologize is to reject not Scripture, which is the world-view of a past epoch, which all too often is retained in Christian dogmatics and in the preaching of the church. To de-mythologize is to deny that the message of Scripture and of the Church is bound to an ancient world-view which is obsolete. (p. 300)

De-mythologizing is an hermeneutic method, a method of interpretation, of exegesis. To those who fear it may dissolve the message of Scripture into a product of human rational thinking, and that the mystery of God might be destroyed, Bultmann assures them:

Not at all! On the contrary, de-mythologizing makes clear the true meaning of God's mystery. The incomprehensibility of God lies not in the sphere of theoretical thought but in the sphere of personal existence. Not what God is in himself, but how he acts with men, is the mystery in which faith is interested. This is a mystery not to theoretical thought, but to the natural wills and desires of men. (pp. 304-305)

Bultmann further explains that "God's word is not a mystery to my understanding. I cannot truly believe in the Word without understanding it. But to understand it does not mean to explain it rationally" (p. 305). He suggests that he also cannot explain love or friendship but can only thankfully receive them and enjoy them.
In the same manner I can understand what God's grace means, asking for it as long as it does not come to me, accepting it thankfully when it does come to me. The fact that it comes to me, that the gracious God is my God, remains forever a mystery, not because God performs in an irrational manner something that interrupts the natural course of events, but because it is inconceivable that he should encounter me in his Word as the gracious God. (p. 305)

Diringer (1982) describes the character of early stories and histories:

It is notable that in the oral traditions of primitive people there is no conception of accuracy or originality or plagiarism; lines or passages would be added or omitted, or other changes introduced. Generally, the importance of events was exaggerated; various episodes were connected with some great natural phenomenon or historical event (such as the Flood or the Trojan War). (p. 15).

It may be safely affirmed that no ancient civilized people or modern primitive tribes preserved any distinct recollection of their own origin. All experience shows that what may be transmitted by memory and word of mouth, consists mainly of heroic poems and ballads in which the historical element is so overlaid by mythology and poetry that it is not always easy to distinguish between fact and fancy. (p. 16)

Leadership within the tribe might have developed with some becoming the equivalent of medicine men or shamen. These in turn gave rise to the later priests, prophets, and chieftains. Their words were respected and were not questioned. Legends and stories abounded and a strong oral tradition was established. After many centuries the stories were revised, refined, possibly embellished, and with the invention of writing were committed to a more permanent record on papyrus scrolls beginning around 950 B.C. (Bowie, 1934, p. 18). The first stage in the development of the Old Testament, then, was the oral tradition and it was roughly before 1000 B.C.
The Egyptians had invented hieroglyphics and the Sumerians had invented the cuneiform script which appeared as wedge-shaped strokes inscribed with a stylus on clay tablets. Creation myths are known from hieroglyphic inscriptions carved inside the pyramids of the Sixth Dynasty (23rd century B.C.), as well as in later texts, one of which is inscribed on four wooden coffins and dated ca. 2000 B.C. (Diringer, 1982, p. 121). Thousands of Sumerian clay tablets have been preserved and have been dated from approximately 2000 B.C., and a considerable number were developed in the latter half of the third millennium B.C. Literature from these tablets has been divided into several categories: (1) numerous epics; (2) myths of origins dealing with the creation of the universe as well as of man; a paradise myth; the deluge and other myths; (3) divine hymns, songs of praise and exaltation of the deities as well as self-laudatory royal hymns; (4) lamentations for the destruction of cities or of the country of Sumer as a whole; and (5) proverbs, aphorisms; fables and didactic compositions (pp. 90-91). While the Jewish were captive in the sixth century B.C., it is suggested they picked up Chaldean (the dominant tribe) or Babylonian (the capital city) views of cosmic history based on nearly 3,000 years of thought dating back to the Sumerians (Asimov, 1981, p. 2).

Kaiser (1970) lists several subjects which have been found to be common to the literature and culture of both the Hebrews and the ancient Near East and Babylonians. Part of that list follows:

(1) The three accounts of creation (Genesis 1:1-2:4a, Genesis 2:4b-2:25, Proverbs 8:22-31, and other allusions found in prophetic and poetical books of the Old Testament).
(2) The serpent and the Garden of Eden  
(3) The Cain and Abel conflict  
(4) The flood  
(5) The Tower of Babel (p. 51)

Kaiser states, "For each of these subjects or topics there are parallels to a greater or lesser degree. The two most famous are the Gilgamesh Epic (Babylonian flood) and the Enuma Elish (Babylonian Genesis)" (p. 51). Kaiser details all of the sources for the various parallels. Scholarship, to date, suggests the biblical stories are not all original with the Hebrews but were adapted and modified from their surrounding cultures.

The ancient Hebrews used cuneiform writing before the Hebrew alphabet evolved some time between 1400-900 B.C. (Hastings, 1951, p. 111). Instead of needing thousands of pictures representing objects and actions an alphabet uses symbols which represent sounds and is much more efficient, necessitating just several dozen symbols. The Hebrew alphabet was probably influenced by Egyptian writing and that of the Semites who occupied the area prior to the arrival of the Hebrews and who had already developed an alphabet (The Magic of Words, 1975, pp. 166-167). It is still unclear, however, who invented the first alphabetic writing. Proto-Sinaitic inscriptions have been dated to 1600 B.C. (Anderson, 1969, pp. 30-32).

Following the oral stage, a second stage in the formation of the Bible occurred from approximately 1000 to 760 B.C. with the writing of the first books.

These might well be called the bible before the Bible, for some of these books are mentioned by name in our Bible, and a few even
Among these are the Book of Jashar, the Book of the Covenant (preserved in Exodus 20:22-23:33), the Records of Nathan, the Records of Gad, and the Records of Solomon. Both the stories of the hero Joshua commanding the sun to stand still, and of David’s lament over the sad fate of Saul and Jonathan, come from the Book of Jashar. (Munk, 1954, p. 80)

There were no copyright laws and ancient authors felt free to quote anyone at any time without permission or credit. Materials were thus accrued from a variety of sources within the culture or from the various surrounding cultures. This national literature consisted of tales of origins, annals of the kings, deeds of the heroic age, oracles of the shrines, priestly liturgies, popular religious songs, and wisdom of the sages (Jeffery, 1952, p. 33).

The next stage began ca. 760 B.C. and continued until about the middle of the second century B.C. During this period the actual books of the Old Testament were written and edited. Among the Israelites several types of literary endeavor slowly developed to form a body of writings preserved in a fixed form:

(a) fragments of early song, (b) archives and chronicles, (c) laws, (d) prophesies, (e) history, (f) cult books, (g) wisdom books (p. 33). The first book was the Book of Amos, and it was followed by the writings of other prophets during the Babylonian captivity. "These writings were not immediately regarded as Scripture--far from it. As a matter of fact, the prophets were usually disregarded and even persecuted by their shortsighted contemporaries" (Munk, 1954, p. 80). It is most fortunate that their writings were even preserved. The last books to be written were Daniel, Esther, and the Book of Psalms (p. 81).
The final stage in the formation of the Old Testament canon began as early as 621 B.C., thus overlapping with the previous stage. During this period some of the books containing what would be called holy Scriptures were recognized as being part of the canon.

The first of these was the Book of Deuteronomy which King Josiah made the law of the land in 621 B.C. The first Bible, then, consisted of only one book; but as time went on four other books were added so that about 400 B.C. it had grown to five. These are the first five books of our Old Testament and are known as the Pentateuch. (Munk, 1954, p. 81)

Table 4 shows the length of the oral tradition before it was reduced in various stages to written form. Many authors believe the oral tradition continued to the final canonization during the time of Ezra (Anderson, 1975, p. 21).

<table>
<thead>
<tr>
<th>Period</th>
<th>Dates</th>
<th>Stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patriarchal Period (Abraham and after)</td>
<td>ca. 1800-1300</td>
<td>Beginnings of oral tradition</td>
</tr>
<tr>
<td>Mosaic Period</td>
<td>ca. 1300-1250</td>
<td></td>
</tr>
<tr>
<td>The Israelite Confederacy (Joshua and Judges)</td>
<td>ca. 1250-1000</td>
<td>Israelite story shaped orally</td>
</tr>
<tr>
<td>Period of the Monarchy (David to fall of nation)</td>
<td>1000-587</td>
<td>Beginning of written Pentateuchal tradition</td>
</tr>
<tr>
<td>Period of exile and restoration (to Ezra)</td>
<td>587-400</td>
<td>Completion of Pentateuchal tradition (Canon)</td>
</tr>
</tbody>
</table>
Gradually more books were added and by the time of Christ, the canon of the Old Testament was completed, having taken almost five centuries. It is significant to note that not all books were unanimously accepted and there was some doubt about whether Esther, the Song of Solomon, or Ecclesiastes should be included (Munk, 1954, p. 81).

The Hebrews' stories came from a primitive period and represent a combination of historical fact and legend reflecting the culture and ethics of the time, but there is also a progressive evolutionary development in the Bible of man's understanding of both God and ethics. This was the basis for the sacred books many regarded as inerrant and directly inspired from God (Easton, 1957, p. 37).

"Every sentence in the Old Testament was profane literature before it became canonical sacred scripture" (Simpson, 1952, p. 499).

The first compilers of the Jewish Scriptures were not governed by any nervous fear lest they should include material that was not perfect. They gathered together everything they could discover which seemed to them to express what their fathers had believed about God, and about this world they lived in, and about the meaning of life. (Bowie, 1934, p. 19)

They included two separate and conflicting creation stories and left them there, side by side, for all to read. They pictured an anthropomorphic God who could be heard walking in the garden in the cool of the day (Genesis 3:8), who planted a garden (Genesis 2:8), made garments (Genesis 3:21), formed with dust, breathed into the first man's nostrils (Genesis 2:7), talked with them (Genesis 3:9, 11, 13)
and to a snake (Genesis 3:14), who needed a day of rest (Genesis 2:2), and made a rainbow to help him remember (Genesis 9:15); and a serpent which could speak (Genesis 3).

They featured a flood narrative (Genesis 6-9), similar to a story which harkens back 5,500 years before present (Severy, 1968, p. 16) from the contemporary Babylonian culture, but the Hebrew account is marked by a clearer insight into the character of God. Their rendition purged the story of all suggestion of polytheism and divine caprice and represented the catastrophe as having been sent by Yahweh to punish human wickedness (Simpson, 1952, p. 446). Their one and only God related to them directly and reasonably, had given them rules, and expected them to abide by them. The idea that God could and would enter the affairs of human history was one that became quite characteristic of Hebrew ideology (Efird, 1982, p. 8).

There are also sagas of battle (Judges 7) and adventure (I Samuel 17) and accounts of human love (Ruth), friendship (I Samuel 20), and religious commitment (Daniel 3, 6). Some of the stories of Israel’s history report mighty miracles such as when Joshua commanded the sun to stand still (Joshua 10:12-13). Spong (1991) points out the primitive view of the cosmos as seen in this story about Joshua.

The sun cannot be ordered to stop, for it is not journeying through our sky. Rather, the earth is turning on its axis. If, out of an inadequate cosmological knowledge, Joshua really caused the earth to cease turning, the gravitational effects would have destroyed this
planet forever. From every side, this story is based upon pre-scientific conclusions. (p. 30)

The pre-scientific world of the Scriptures also speaks of the sun "rising" (Mark 16:2) and "setting" (Mark 1:32) as it certainly appeared to be doing just that.

Other stories include exaggerations of heroic exploits as when Samson killed a thousand men with the jawbone of an ass (Judges 15:15). Genealogies (Genesis 36, Numbers 1-3), prophetic oracles (Hosea, Amos, Isaiah), wit (Proverbs 25-7), memoirs (Nehemiah), maxims (Proverbs), and biographies (David in I and II Samuel) are included. The Hebrews recorded their laws pertaining to their relationship with God (Exodus 21-22) as well as their rules for buying and selling, sanitation (Leviticus 11-13), and everyday community behavior. They wrote the details of how they built the tabernacle (Exodus 25) and how they performed worship (Leviticus 1-9). "Some of these ancient writings are literary masterpieces, but none of their authors expected to have his book canonized as scripture" (Pfeiffer, 1962, p. 499).

[Scripture] consists of a body of writings of different age and authorship, formed by a gradual process of selection, and little by little acquiring sanctity and authority. The writings assembled in such sacred books are of various kinds, some historical, some didactic, some hortatory, some perhaps magical, but they gain their authority because the community feels that in them is enshrined something that is of vital significance for the practice of religion whose sacred books they are. (Jeffery, 1952, p. 32)

Presently, Jewish, Protestant, and Catholic scholars theorize that the Pentateuch (the first five books of the Old Testament) is a composite work in which several traditions or "sources" have been blended together. According to
this hypothesis, which rests on the critical labors of more than two centuries of intensive study, there are four main literary strands which have been designated by the symbols J, E, D, and P. These strands of tradition were woven together until the Pentateuch reached its final form about 400 B.C. They are summarized in Table 5. Many fundamentalists hold that Moses was the author of the Pentateuch and reject this thesis and the scholarly base upon which it is established. A defense of the Mosaic authorship is offered by MacDonald (1992, pp. 25-27).

<table>
<thead>
<tr>
<th>Source</th>
<th>Description</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>J</td>
<td>A Judean source, coming from the time of the early monarchy, which refers to the divine name Yahweh (sometimes spelled Jahweh)</td>
<td>ca. 950 B.C.</td>
</tr>
<tr>
<td>E</td>
<td>An Ephraimitic or North Israelite source which favors the use of the divine name Elohim</td>
<td>ca. 850 B.C.</td>
</tr>
<tr>
<td>D</td>
<td>A source, best represented in the book of Deuteronomy which reflects the style and theology of the period of Josiah's reform (621 B.C.)</td>
<td>ca. 650 B.C. &amp; later</td>
</tr>
<tr>
<td>P</td>
<td>A source, marked by the style and cultic interests of the priestly circle, which comes from the period after the fall of the nation in 587 B.C.--that is the time of the Babylonian exile</td>
<td>ca. 550 B.C. &amp; later</td>
</tr>
</tbody>
</table>

Canonization

Canonization is accorded writings which are believed to have divine revelation. The Greek word "canon" originally meant "reed." It has evolved to mean something straight, direct, or firm like a reed. Eventually its meaning
included a tool for measuring, a rule, standard, or model. The church fathers used the word "canon" for the biblical law and articles of faith, and for a list of the divinely inspired books (Pfeiffer, 1962, pp. 498-499). Childs (1986) defines Scripture as authoritative writings and the canon is restricted to a dogmatic decision through which the limits of Scripture are defined and fixed. The interaction between a developing corpus of authoritative literature and the community which treasured it must be appreciated (p. 58). "The heart of the canonical process lay in Israel’s search for identity" (p. 59). "Many a literary work was in circulation and eagerly read for centuries before it became canonical, i.e., was included in the 'canon' (the authoritative guide for the religious society)" (Koch, 1968, p. 10).

Who has, or had, the authority to decide what writings should be included in the canon (Bible)? For every legitimate prophet during Old Testament times there were hordes of false prophets. Upon what bases were materials chosen to be preserved as holy writ and others deemed unworthy of such status? This is called the problem of the canon. Canonization status was usually given by some council or convocation of recognized, authoritative church leaders. Before final decisions were made, a long period of time elapsed as the writings "proved" themselves, so-to-speak. Writings did not become adapted as Scripture immediately upon being written.

Several stages can be identified in the process by which the biblical writings became part of the canon. Initially, the original writers recorded their texts. Then
came the editing, arranging, and collecting of these writings. Finally, the decisions for canonization were made.

Out of a vast body of national Hebrew literature the books of the Old Testament were selected because of their literary beauty or their nationalistic appeal, because they contributed to keep alive the nation and the worship of Jehovah. The men responsible for collecting and canonizing the Law, the Prophets, and the Writings were convinced that every word in them was divinely inspired by God. In reality, of course, only the prophets (including Moses, according to Deuteronomy 18:18, Hosea 12:13-14, and Numbers 11:24-30), in moments of ecstatic trance, experienced divine inspiration, feeling themselves filled by the divine spirit and uttering God's words; in normal conditions, if they were sincere, they could not utter divine oracles (Jeremiah 28:10-14). (Pfeiffer, 1962, p. 500).

There is much uncertainty among scholars as to sequence, dates, and even the definition of the canon. It is an active area of research. "To extrapolate a history of canonization from a highly complex and obscure literary process remains a very fragile and tentative enterprise" (Childs, 1979, p. 54). "Its terminology, history and function remain highly controversial" (p. 57). "Because of the lack of historical evidence, it is extremely difficult to determine the motivations involved in the canonical process" (p. 62). Most scholars do agree that the Pentateuch took shape at the time of Ezra in the fifth century B.C. when the Jewish captives were released from Babylon and returned to Jerusalem (p. 63).

Today, however, all the bibles of the religions are subject to the scrutiny of scientific criticism. The end result is that thoughtful men no longer believe any are infallible. This does not mean that sacred books have no value, or that they can be discarded without loss. Nothing could be farther from the truth. As sources of enduring religious insight, they are priceless; but they must be studied critically as well as devotionally if they are to continue to contribute to the spiritual life of modern man. (Munk, 1954, p. 35)
The Interpretation of the Bible

Farley (1994) notes that "when something has been around long enough and is a matter of almost universal consensus, the fact that it is an interpretation, one among many possible ways of seeing and thinking, becomes invisible" (p. 91). The fact that it may not be the only possible way of seeing something becomes clouded and it seems to be the "right" and "true" way. Everything humans do, think, and believe is interpretation and it reflects our acculturation, gender, and experience. When the Bible is interpreted these factors interplay and it is helpful to be cognizant of the particulars which have contributed to such interpretation. Only from that point can the interpreter be free to modify and control the interpretation.

Brown (1955) outlines four means which have been used to interpret the Bible. One way is allegorically. An allegory is a story with hidden meanings, and many Christians, especially the Early Church Fathers, used this method. For example, they would take the story of the Good Samaritan and assign meaning to each participant. The "certain man" was Adam, they might say. The robbers were the devil, the Good Samaritan was Jesus, and the inn was the church. A story about neighborliness becomes a drama of the whole Christian message of salvation (p. 17-18).

Since religious language must always make use of imagery, the method of allegorical interpretation can sometimes serve a useful function. The danger is that one who is not a scholar and expert can "twist" a story to mean whatever he wants it to mean, and not only
may the real point of the story be lost, but utterly false meanings may be "read in." (p. 18)

A second means of interpretation is to take the Bible literally as almost a mysterious magical reference book which contains the very words of God. Since the words are believed to be the very words of God, they are presumed to be infallible, inerrant and literally true, and therefore of equal profit and value. Literalism would interpret the record of the six 24-hour day creation or the worldwide flood as historical fact.

Some might modify this position and hold to the inerrancy and infallibility of the original manuscripts only, suggesting some errors may have crept in through translation and transcription down through the centuries. This concept of "verbal inspiration" does not mean exactly the same thing to everyone.

Those who hold the view commonly designated as plenary and verbal inspiration claim that the biblical writers were divinely secured against any and all mistakes by virtue of their divine inspiration, and affirm, further, that that which constitutes the Bible a divine book is the fact that the Holy Spirit so dominated and guided the minds and pens of those who wrote as to make their writings free from mistakes of any and all kinds, whether it be mistakes of history or chronology or botany or biology or astronomy, or mistakes as to moral and spiritual truth pertaining to God and man, in time or eternity. According to this view of biblical inspiration, whatever the Bible says must be true because it is God's own Word; what it says is what God says. (Eiselen, Lewis, & Downey, 1929, p. 27)

Literalism, as far as the Christian Church is concerned, is a comparatively recent development. It may have arisen after the Protestant Reformation when many reformers, in a continual repudiation of the absolute authority of the Pope
turned more and more to a belief in the absolute authority of the Scriptures (Brown, 1955, p. 18). Swaim (1953) traces the popularity of literalism as a response to Darwin's theory soon after it was presented in the 19th century (p. 124).

"Religious language must resort to symbolism, imagery, and poetic description on certain occasions, and such use of language loses its religious significance if taken literally" (Brown, 1955, p. 19). For instance, a problem with this view arises when one attempts to deal with a story where a woman "gets her man" by seducing her father-in-law (Genesis 38) and becomes a religious heroine or the story of an acknowledged "man of God" who sacrifices his daughter for victory in battle (Judges 11:29-40). Educated people of the 20th century ask incredulously if God can really be speaking to them in stories like these (Easton, 1957, pp. 36-37).

Other problems with this means of interpretation arise when the science of the Bible is considered. For instance, the Bible assumes that the plants and animals with which we are familiar are part of the unalterable original state of the world as God created it. Scientific data demonstrate that the forms of life existing now did not previously exist and that others which formerly existed no longer do so (Brunner, 1952, p. 32-3).

It is also significant that no animals or celestial bodies are mentioned in the biblical account of creation except those with whom the writers were familiar. No protozoans or other microbes or extinct species such as dinosaurs were included,
nor were asteroids, nebulae, black holes, or other planets. Domesticated animals were mentioned as though they were created as such. Science attests to domestication being recent and from wild stock which would have been "in the beginning." The biblical writers appear to be confined to their own life experience, just as normal, uninspired writers are, and they include the fallacies and limitations common to any "uninspired" writer.

At the time the Bible was written it was believed that the Earth was flat and that a sea lay under it (Psalm 136:6, Psalm 24:1-2, Genesis 7:11). The heavens are described as a tent or an upturned bowl above the flat Earth (Job 37:18, Genesis 1:6-8, Isaiah 40:22, Psalm 104:2). The Earth is described as stationary (Psalm 93:1, Psalm 104:5). A sea was above the sky (Genesis 1:7, Psalm 148:4). There were windows in the sky through which the rain came down (Psalm 78:23, Genesis 7:11) (Fosdick, quoted in Moody, 1970, p. 493). The Scriptures speak of the sun "rising" and "setting" as it appeared to them that it came up and went down. All of these images are not accurate scientifically.

The Bible is not a book of science. If this fact had been acknowledged and remembered, many a conflict that has brought discredit on both science and religion could have been avoided. The 139th Psalm is true whether the earth is flat or round. . . . Science, however necessary, is sensate, and cannot sound the depths. It is of the analytic mind, and therefore cannot serve the wholeness of man's nature. It can give some answer to "How?" but none to "Why?" Only faith can say why, and every man must live by some faith. . . . The Bible is not a book of science. It has mightier business on hand. (Buttrick, 1952, p. 166)
Some suggest that to demand accurate science of the Bible is to embarrass it. To demand the flawlessness of God in the writing is to ignore numerous inconsistencies and inaccuracies.

In his book written to help students understand the Bible, Stott (1972) establishes at the beginning that the purpose of the Bible is not scientific.

Science (or at least natural science) is a body of knowledge painstakingly acquired by observation, experiment and induction. The purpose of God through Scripture, however, has been to disclose truths which could not be discovered by this empirical method, but would have remained unknown and undiscovered if He had not revealed them. For instance, science may be able to tell us something about man's physical origins; only the Bible reveals man's nature, both his unique nobility as a creature made in the Creator's image and his degradation as a self-centered sinner in revolt against the Creator. (p. 14)

Stott states also that "a tentative acceptance of some form of 'progressive creation' need not in any way detract from man's uniqueness" (p. 63).

The Scriptures are composed of prophesy, poetry, law, allegory (a comparison story with a veiled meaning), metaphor (a figure of speech in which a word or phrase that literally means one kind of object is used in place of another), proverb, riddle, symbolism, parable (a comparison), simile (one thing is likened to something else, usually using the word "like" or "as"), and myth, as well as literal and historical content. "It is always of critical importance to know exactly with what type of linguistic usage one is dealing and to apply the appropriate canons of interpretation" (Hyers, 1984, p. 14). The Bible was not written as a science book although much of its science is accurate; it was not written for its literary content.
although it expresses exceptional beauty; it was not written as a philosophy book although its wisdom is most profound. It was primarily written as a book of salvation. Its whole sweep is to express relationship between the Creator and the created. "When one surveys the history of science/religion controversies, one finds linguistics confusion to be a major source of misunderstanding and conflict" (p. 16).

Hyers affirms the extraordinary literary quality of the Scriptures but maintains:

_Bible authors would have been dismayed by the suggestion that they had a literary purpose. . . . Indeed it could be argued that the Bible is on guard against literature, and against all other 'words of man's wisdom' that might offer to the reader a refuge from the tremendous onsets of God._ (p. 166)

An additional problem associated with interpreting Scripture as inerrant and literally true is that some parts are definitely honored more than others; there seems to be a ranking whereby some books or sections seem to be more inspired than others. There was more message in the parables of Luke than in the laws of Leviticus; more theology and instruction for living in Romans and the other epistles than in Judges. Proponents of this method of interpretation must answer why the different parts of the Bible have different importance and value if all were inerrantly inspired. What are the bases upon which they judge which parts should be read literally and which are to be taken as parable or allegory? Everyone, for example, would admit that Jesus meant something very profound and nonliteral when he said "I am the door" (John 10:9) or "I am the vine" (John 15:5) or when he was called the Lamb of God (John 1:29). What interpretation is given to Psalm
47:1, "Clap your hands, all you nations"? Upon what basis can one be certain that Genesis 1 and 2 must be interpreted literally?

Buttrick (1952) states that the doctrine of verbal inerrancy has "repelled thousands of youth who might otherwise have been won to eager study of the Scriptures" (p. 166) and that the response to people should be as Jesus' was of similar doctrines, "You nullify the word of God by your tradition" (Mark 7:12-13) (New International Version, 1973, p. 1053). The Apostle Paul wrote that the letter or "written code kills, but the spirit gives life" (II Corinthians 3:6) (p. 1209).

Jesus' approach to every problem was vital rather than legal. In directing our study of the Bible, then, the Scripture encourages us to search out the spirit rather than merely look at the letter. It is possible to be thoroughly conversant with the letter of the Bible and miss its spirit completely. (Swaim, 1953, p. 114)

An example where Jesus elevates the Scripture from legalism and literalism is found in Matthew 12:1-14 (see Appendix E).

Poole (1990b) warns, however, that incorrect interpretation can be a means "of ducking the implications of biblical teaching which are far from ambiguous" (p. 69), and he also suggests that "it's the spirit, not the letter that counts" can be inaccurately applied by readers who wish to ignore some biblical truth.

"Sometimes 'interpretation' and 'the spirit' are oddly imagined to sanction the complete opposite of what the letter actually says, particularly when what it says is unpalatable" (p. 69). Once again, the challenge and difficulty in correctly interpreting the Scriptures is noted.
Some would say that Christians who interpret the biblical creation accounts literally and as an inerrant Word have not only misunderstood science but are unsophisticated in the textural and historical criticism of the Bible as well.

"Criticism involves a rational and a questioning approach to the material being studied" (Denbeaux, 1958, p. 22). The scholar assumes the role of a seeker rather than a knower. The searcher is willing to admit initial ignorance and "he yields to the book, whether it makes him uncomfortable or not" (p. 23).

The whole difficulty here lies in the fact that we try to use the Bible in ways for which it was never intended. The Bible as we know it is the work of many writers, writing at widely diverse periods in human history. The contributions of these multitudinous writers are almost inextricably mixed, although modern Biblical scholars have done much to untangle the intertwining strands. All of the writers had this in common: They were interested in religion, not science, and they did their writing long before anyone knew anything about modern science. If in writing of religion they had occasion to refer to science they inevitably did so in terms of the science known in their day. So if we piece together these scattered references to the physical world we obtain a picture of the world and solar system as these people thought them to be. (Moody, 1970, pp. 492-493)

Wells (1962) summarizes the position of literal inerrancy when he states, "Historical, critical, and philological analyses of the Bible make Fundamentalism, at the point of biblical inerrancy, a pretty indefensible position" (p. 305).

The third method of biblical interpretation according to Brown (1975) is to interpret the divine-human book critically. Those who hold to this means would say that while the Bible is the Word of God, it is not the words of God. The divine element is present throughout the Scriptures, and it is expressed in the content and moral truths; that these words speak to the head and heart and conscience with
the voice of God. That is the element in it which many Christians recognize as divine. Its appealing and potent quality in behalf of virtue, holiness, brotherly love, and whatever else is Christlike and Godlike makes the book, however human, designated as divine. The Bible is a record of the revelations God made to devout patriarchs, prophets, poets, wise men, psalmists, and apostles. In this sense it might be said that the Bible, instead of being itself God's primary and original revelation, is, rather, the result of revelation. The revelations came before the Bible came (Eiselen et al., 1929, pp. 27-30).

Greene (1961), quoting Abbott, explains that the Bible was viewed as "a collection of literature, containing in a pre-eminent measure the growth of the consciousness of God in the human soul, as interpreted by the pre-eminent religious leaders of a pre-eminently religious people" (p. 27). He (Abbott) further suggests that the authors of the Bible were not divine amanuenses transcribing a supernatural message, that revelation was not handed down from above. It was a progressive human discovery of moral and spiritual truth under divine tutelage and inspiration. The writers of the Bible played a pre-eminent role and were lifted above ordinary men in power of perception and expression, but they by no means transcended the limitations of human nature. In science and philosophy, they were children of their time and race (pp. 27-28).

This means of interpreting the Scriptures recognizes that they are a combination of historical fact and legend and they must be seen in the light of the situation in which they were written. Many writers composed the Scriptures using
numerous and various literary forms such as allegory, songs (love, marriage, harvest, work, victory, drinking, watchman), poetry (both secular and religious), parable, historical account, novelette (a long short story), saga, hymn, myth, law, codes, letters, laments, legends, fairy tales, fable, and prophesy (Brongers, 1989, pp. 98-164). Serious Bible study helps identify the particular literary form and aids in the correct interpretation of the meaning.

Since the Bible is a collection of writings originally recorded in Hebrew and Greek from another time, place, and culture, a serious student first becomes acquainted with the traditions, cultural and geographical contexts, history, and language of that period. "The Interpreter must go back wholly in spirit to those remote centuries of the East and with the aid of history, archaeology, ethnology and other sciences, accurately determine what modes of writing the authors of that period would be likely to use, and in fact did use" (Boadt, 1984, p. 13). After this background is understood the religious development of a particular passage can be explored.

To interpret and understand the sacred writings, the particular people to whom they were written and the various historical settings in which they lived must be considered. The reader must also try to understand what the text is trying to say in relation to the background of the writer (Denbeaux, 1958, p. 13). This information sheds insight into the purposes for and messages of the various texts. Study with this rigor requires a serious time commitment, a certain level of training
in theology and language as well as skills in critical thinking. It demands much research, thought, and discriminating judgment.

There has been increasing insistence among scholars and truth-seeking people of faith that the text of the Scriptures should be studied rigorously using the best techniques of scientific analysis. Dating, authorship, literary unity, and historical reliability should be scrutinized. Archaeological and linguistic evidence have also been utilized in interpreting the Bible (Brueggemann & Wolff, 1975, pp. 13-15, 21).

The scholarly study of biblical texts is known as biblical criticism, which is usually divided into two allied disciplines: textual (or lower) criticism and historical (or higher) criticism. The former attempts to recover as closely as possible the exact original words of the Bible, finding the best text available. The latter seeks to understand what went into the writing of a biblical text, such as who the author(s) were, dates of composition, original purpose, the style, cultural influences, and possible oral antecedents (Ginsberg, Loetscher, Maccoby, & Zicarelli, 1992, p. 120). These disciplines, developed in the 20th century, help the student of Scripture envision the writings in their original setting.

The discipline of textual criticism is used by those open to deeper and more scholarly research on the Scriptures. It originated among the Greeks as they studied the Homeric epics and its revival in the 18th and 19th centuries with respect to the Scriptures began in Germany and has flourished in the 20th century. Textual criticism has two main processes: recension and emendation. "Recension
is the selection, after examination of all available material, of the most trustworthy
evidence on which to base a text. Emendation is the attempt to eliminate the
errors which are found even in the best manuscripts" (Metzger, 1968, p. 156).

If the only reading, or each of several variant readings, which the
documents of a text supply is impossible or incomprehensible, the
editor's only remaining resource is to conjecture what the original
reading must have been. (p. 182)

Textual critics use the science of paleography which is the classification of
manuscripts according to their age in the light of their handwriting and other
indications (p. 157).

As Grobel (1962) asserts, "All literature invites criticism; all important
literature demands it, if the writing in question is to be used reliably (as for history
or law) or worthily (as for artistic production) or in genuine reverence (as for
religious or ethical guidance)" (p. 407). Criticism is the power of discernment,
without which articulate thought is impossible. It is misunderstood to be
disparagement, for criticism can be the highest form of appreciation,
discriminating appreciation.

These fields of inquiry developed as scholars became less satisfied studying
Scripture in its present form and sought to understand it from its beginnings. This
scholarship expresses the power of honest study over the subjective opinions of
men.

In order to discover the roots of the religious ideas and how they had
evolved, it was not enough to ascertain with the literary critics how a
particular piece of literature was composed or who were its authors. It was especially necessary to inquire about the background of the
texts and the religious ideas of the authors, to search for the origin (sitz im Leben) of the forms and genres (Gattungen) that were used, and to trace the origin of the motifs and theories in the documents (Stoffgeschichte). (Houtman, 1989, p. 176)

Such research has revealed through archaeology, for instance, that when Israel appeared on the world scene there was already an advanced civilization in the ancient Near East. It has become evident that there was a lively cultural exchange during that era and that Israel was intimately linked with the culture and history of the world of its contemporaries. Among other significant information provided through critical research has been the discovery of a Babylonian story of creation and a Babylonian account of a flood which are surprisingly similar to the Genesis accounts. In addition, the discovery of the laws of the Babylonian king Hammurabi which have close resemblance to the laws of Moses have been of great interest (p. 176).

One of the problems associated with a more diverse method of biblical interpretation is that it can become difficult to discern which is literal fact and which is not, and this can be dangerous for it tends to rob the Bible of its authority. Christians who follow this type of biblical interpretation strongly claim that the Bible is filled with messages, promises, and warnings to them from God and that He guided the writers, the translators, and the interpreters. They respect this collection of writings as their guide for life and truly believe that God continues to speak through its inspired word. They do not claim its inerrancy or infallibility throughout, but they study it, live by it, and acknowledge it as the means by which
God continues to relate personally to them. It is not idolized but seen as a means by which they link to God, who is the object of their worship. They are open to fresh insight and revelation. It is a living book.

Popper (1956/1983) maintains that "the growth of knowledge consists fundamentally in the critical revision of our beliefs; a fact that establishes that we are not bound to our fundamental beliefs" (p. 155). This continued revelation gives life to the Bible and to faith and is not to be feared but welcomed. It encourages the ability of transcending some of our beliefs and thereby comes growth and liberation (p. 155).

Brown's (1955) fourth method of biblical interpretation is to read the Bible as actors who are involved in the biblical drama of God's search for men and women. This means looking at the Bible as a living book, addressed to us; we are not spectators, but participants. It means that when Jesus said to the disciples, "Who do men say that I am?" we are being asked that question. The story is our story (pp. 21-22). This method of interpretation can be combined with the first, second, or third method.

Easton (1957) outlines three principles which will guide serious Bible students in their study of the Scriptures. (1) Recognize that some truths cannot be expressed literally and to try to do so is to take the real meaning out of them. (2) If God is going to speak to humans in any meaningful fashion, he must speak to them in terms that they can understand, that is, in terms of their own experience.
(3) Faith speaks only to faith and the Bible speaks the Word of God only to those who go to it in faith and expectancy (pp. 38-43).

Jansen (1968) suggests four important things about understanding the Bible: (1) The Bible is primarily a confession of faith in a God who has entered human history to claim and to renew mankind, (2) the Bible speaks of promise and fulfillment, and the New Testament cannot be understood apart from the Old Testament, (3) God continues to speak through the words of Scripture and the full truth of the Bible is found only in commitment, and (4) the whole story reminds us that "God is His own Interpreter, and He will make it plain." The latter is facilitated through the Holy Spirit (pp. 15-16). Although God is his own interpreter, Jansen continues, the student of Scripture must bring a disciplined mind and a receptive heart to this task. Faith offers no shortcuts to responsible reading of the Bible (pp. 16-17).

Interpreting means finding what is actually said by a passage. It is very easy to "read into" a passage something that was not intentioned. The process of exegesis is the careful analysis of Scripture, aiming at accurate description of meanings within the text. It derives from the Greek "to lead out" and is the antithesis of "reading into" the text (p. 17). Exegetes study original languages to determine as carefully as possible the original meaning of the text.

Jansen warns of dangers the interpreter faces: (1) assuming too quickly that the Bible says what we think it should say, (2) hearsay: letting others do our interpreting, (3) long distance: avoiding personal involvement by keeping the Bible
in the past, (4) separating "critical" from "devotional" reading, (5) interpreting words out of context, and (6) confusing unity with uniformity (not imposing on the Bible a uniformity that is not there yet looking for the unity of faith that is expressed amid the diversity of expression) (pp. 19-27).

The Two Genesis Creation Accounts

The two stories of creation found in Genesis are entirely different, conflicting in detail and chronology at many points (see Appendices B and C). Fritsch (1959) compares them as seen in Table 6 (pp. 20-21, 27).

Spong (1991) notes that in the Genesis 1 story the creation is by divine fiat "Let there be" while in the Genesis 2 account God "molds from the dust."

Furthermore, he points out the strong patriarchal overtones of the second account: the man was created first and in the image of God but the animals came from the ground, were for the purpose of finding a helpmate for the man, and the woman came from a rib of the man. It does not mention that the woman was made in God's image and it particularly notes she was made as a helpmate for the man (p. 29). None of this is included or inferred in Genesis 1.

Skehan (1983) compares the Genesis stories, believed to be written between 400 and 500 B.C., with a Babylonian epic known by its opening words 'Enuma elish' meaning "when on high." This Babylonian creation myth dates from at least 2,000 B.C. and was one of many cosmogenies current in the ancient Near East. The similarities are striking, suggesting a strong influence on the Hebrews by
Table 6. Comparison of the Two Genesis Creation Accounts.

<table>
<thead>
<tr>
<th>Genesis 1:1-2:4a</th>
<th>Genesis 2:4b-23</th>
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<tbody>
<tr>
<td>- &quot;P&quot; or priestly author(s) who views the universe as God’s temple in which the</td>
<td>- &quot;J&quot; author(s) refers to God as Jehovah (Jahweh in German) or Yahweh</td>
</tr>
<tr>
<td>created beings worship their Creator</td>
<td>- More vivid and exuberant</td>
</tr>
<tr>
<td>- Creative activity of God expressed in orderly progression</td>
<td>- Style more simple</td>
</tr>
<tr>
<td>- Sabbath sanctioned by Deity as a day of rest</td>
<td>- Author less interested in matters pertaining to worship and ritual</td>
</tr>
<tr>
<td>- Man, the crown of God’s creation, presides as divinely appointed high priest</td>
<td>- Conception of God more anthropomorphic (He molds clay, breathes, plants, builds)</td>
</tr>
<tr>
<td>- Creative acts compressed into a schematic pattern of six days</td>
<td>- No schematic pattern of time</td>
</tr>
</tbody>
</table>

**Order of Creation**

1. Light  
2. Firmament  
3. Dry land; vegetation  
4. Luminaries  
5. Birds; fish  
6. Animals; man(kind)  

**Order of Creation**

1. Man  
2. Garden of Eden  
3. Trees, including the Tree of Life, and the Tree of the Knowledge of Good and Evil  
4. Animals  
5. Woman  

**Similarities**

- The one true and living God is the sovereign Lord of Creation  
- This Lord is prior to, and distinct from the finite, material universe  
- God is the one, true, personal and loving God whose existence is unquestioned and whose authority is unchallenged.  
- Man is the crown of God’s creation with dominion over the animals, one placing man at the end as the creative culmination and one placing man at the beginning showing all created beings (including woman) as being subservient.
the surrounding, more established Babylonian culture. The Enuma elish had, among other things, primeval chaos with darkness, light emanating from the gods, creation of the firmament, dry land, luminaries and man. The gods rested and celebrated at the end (p. 313). There is also evidence that the Hebrews were influenced by other creation stories which were prevalent in the surrounding cultures (Sarna, 1972, p. 2).

In spite of these similarities, there are significantly different messages in the separate accounts. For instance, the Enuma elish pictures creation as a struggle between the gods and forces of chaos whereas the biblical account stresses the one God's effortless activity (Skehan, 1983, p. 313). The Genesis narratives are non-political, non-cultic, and have no ritual drama, all of which were essential characteristics of the pagan religions. There are no stories about events in the life of the creator—no theobiography. He was pre-existent. There is no physical link between the world of humanity and the world of the divine. The biblical creation account is a prologue and merely opens the historical drama that subsequently unfolds. It establishes unequivocally the inescapable sovereignty of God and the subordination of all creation to the supreme creator (Sarna, 1972, pp. 4-12). None of the creation stories could in any modern sense of the word be scientific accounts of the origin of the physical world.

Biblical man, despite his undoubted intellectual and spiritual endowments, did not base his views of the universe and its laws on the critical use of empirical data. He had not, as yet, discovered the principles of methods of disciplined inquiry, critical observation or analytical experimentation. Rather, his thinking was imaginative,
and his expressions of thought were concrete, pictorial, emotional, and poetic. (pp. 2-3)

What then is the purpose of the Genesis stories? Their point is not scientific, but religious. They exclaim loudly and clearly that the world and all that is in it was created by a divine, omnipotent Creator, not by many gods, as was believed in the world at that time. What is more, that Creator desires relationship with the created, another revolutionary idea. The morality expressed in the Genesis accounts attests further to its religious significance. The Genesis texts are religious, not scientific or historical. Their meaning goes much deeper than merely being a record of a temporal happening. Their meaning spans time into eternity.

Brown (1955) lists four important religious messages which are powerfully presented in these creation stories:

(1) They are stories about God.

(2) All that is, is dependent on God.

(3) Creation is good.

(4) Since God created the world, there is meaning and purpose behind it (pp. 57-59)

Yes, the first chapters of Genesis are great religion. Why worry about the fact that they are not valid science? Acceptance of the Bible’s religion is in no way dependent upon acceptance of such scientific allusions as it chances to contain. It is just as possible to worship a God who works through natural laws, slowly evolving life on this planet, as it is to worship a God who creates by sudden command. (Moody, 1970, p. 496)

The creation texts are then seen as examples of the attempts of ancient peoples to comprehend the world by the limited information and tools at their disposal. Since we are in possession of superior
knowledge and instrumentation, we have gone beyond these earlier views, more or less as brick buildings have gone beyond straw huts or sheepskin tents. (Hyers, 1984, p. 16)

Toward the end of the 19th century, form critic Gunkel clarified the difference between Genesis chapters 1-11 and real history in the following points:

(1) Genesis 1-11 originates in oral tradition while history is found in literate societies and in written documents of actual events.

(2) Genesis 1-11 deals with personal and family stories while history concerns itself with great events of public interest.

(3) Genesis 1-11 depends on the imagination of the raconteurs while history must be traced back to first-hand evidence.

(4) Genesis 1-11 (and this is the "most significant" criterion) narrates the impossible (origin of stars after the planets, derivation of all the streams of the earth from a single source, a chronology of 2,666 years from creation to the Exodus, all the animals in the ark, Ararat the highest mountain) whereas history narrates the possible.

(5) Genesis 1-11 is poetic by nature and intends to delight, inspire, and elevate while history is prose which seeks to inform.

(6) Genesis 1-11 is different in form from the classical example of true Hebrew historiography in I Samuel 9-20 whereas history is identical in form and style to those searching, uncomplimentary documents of David's Court in I Samuel 9-20. (Kaiser, 1970, pp. 50-51)

This summarizes the understanding modern scholars have of this literature: a primeval history reflecting its Near Eastern origins (mainly Babylonian) from which it was borrowed (Kaiser, 1970, pp. 50-51).

What should equally sincere Christians do when they disagree in various aspects of Biblical interpretation?
We should be humble enough to re-examine them ourselves in the light of sound principles of interpretation. And we should be mature enough to discuss them with one another without rancour. If then we still disagree, we must regard such disputed points as being secondary in importance and respect one another with mutual Christian love and tolerance. We should also rejoice that in all the central doctrines of the faith we remain agreed, for in these the Scripture is plain, perspicuous and virtually self-interpreting. (Stott, 1972, p. 219)

Conclusion

To understand the two sources which speak to the subject of origins, a Christian must be familiar with the data generated and interpreted by a variety of scientists as well as that which is contributed by historic and text critics, and other biblical scholars. This requires intense discipline and time-consuming research, and most Christians do not have the time, interest, or skills to do such a study justice. They rely on scholars, teachers, pastors, authors, and other leaders to do this study for them. Since both studies are difficult and impossible to totally conquer, no one possesses all knowledge of the important subjects of origins and development. Consequently, there exists a variety of interpretations, some based on more scholarship, objectivity, and insight (and even scholars debate the meanings of some biblical passages or physical phenomena), and some which include personal opinions, preconceived ideas, and biases. The conscientious and critically thinking student reads across the spectrum of materials in order to critically discern and prayerfully access where the truth resides, and retains an
open mind, ready to objectively consider additional, novel information as it subsequently and inevitably is presented.

**Critical Thinking and Transformative Learning**

**Background**

The intellectual roots of critical thinking go back to the teaching of Socrates 2,400 years ago. Other scholars in more recent centuries such as Voltaire, John Henry Newman, John Stuart Mill, and William Graham Sumner have variously articulated his insight (Paul, 1990, p. 2).

The educational goals in the United States during its early decades did not include critical questioning and analytic thinking. Students were taught the "3 R's," some basic catechism, and patriotic history. By 1900 the average North American spent little more than two years in school. Between 1917 and 1934, as a result of the Army Alpha Tests given to inductees into the armed forces, it was determined that the average U. S. citizen was somewhere between 13 and 14 years of age intellectually (Paul, 1990, pp. 3-5).

Even today it is questionable whether Americans have been challenged to think for themselves beyond the most primitive levels. There continues to be an overemphasis on rote memory and recall of facts and an absence of training in active, independent, self-directed learning where students are instructed how to gather and assess data rigorously and critically (Paul, 1990, p. 6). Meyers (1986) explains that "colleges and universities came to ... focus more on the transmission
of information, largely because of the advances in the sciences and concurrent changes in educational goals" (p. 1).

Paul (1993) decries the status of education in the United States, describing "the unending dominance of unimaginative teaching; students in their turn, episodically memorizing, reiterating, parroting, ignoring, avoiding, hiding and opining; in their hearts and minds heedless, . . . inconsistent, . . . passive, . . . apathetic, . . . confused, dogmatic" (p. xiii). There is reason to suggest that most Americans still do not exhibit critical thinking skills in many areas of their lives and that there is need for increased training for educators so they may impart these skills to their students.

Paul (1990) states that interest in critical thinking in the United States can be traced back to and beyond Glaser's *An Experiment in the Development of Critical Thinking* (1941) and his design with Watson of the Watson-Glaser Critical Thinking Appraisal (1940) (p. 1). Reilly (1947) records that the National Institute for Straight Thinking was founded in 1932 (p. x).

A statement by Lane in 1923 exemplifies well the lively thinking which had been occurring in some minds even before then. Referring to the data being generated by the science of his time, he spoke to all Christians:

> The author has attempted to maintain the scientific attitude of mind, which consists in an honest endeavor to receive the truth whatever its nature and source, in a determination to secure all facts essential to the question at issue, with the intention of testing every hypothesis by application to further facts and relations, discarding each hypothesis whenever it becomes untenable by reason of contradictory phenomena, and of arriving at final judgments only
when there seems no escape from them; in a spirit of tolerance for the opinions of others whether in accord or in disagreement with his own, a spirit which seeks to account for them rather than to ridicule or denounce them; in short, with a freedom from acrimony, blind partisanship and prejudice to seek the truth that makes men free.
(p. 6)

In 1933, Dewey gave the term "reflective thought" to higher order thinking and defined it as "active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusions to which it tends" (p. 9). This definition implies that something is believed on the basis of evidence, proof, warrant. Dewey defined that basis as "ground of belief." It is not believed on its own account but is substantiated through something else (p. 11). Non-reflective belief, on the other hand, rests on tradition, misinterpretation, custom, limited knowledge, whim, authoritative decree, myth. It is not challenged and often results from laziness or lack of courage or curiosity to find a basis. Dewey was on the track of critical thinking in the '30s.

In the decade of the '40s, Reilly (1947) wrote, "Although we can often see that the conclusions of another person are false, extravagant, prejudiced, or one-sided, each of us is inclined to feel that his own thinking is quite reasonable" (p. 6). He further stated that "anything that you believe because you were born in a certain family, city, state, or nation, and are identified with certain economic, political, educational, social, business or religious institutions, is a prejudice and
open to question" (p. 18). Objectivity is difficult even for the conscientious thinker and continual assessment is obligatory for critical thinking to exist.

Reilly suggests the following rules for securing evidence:

1. Expose yourself to sources of evidence on all sides of the question.
2. Appraise the validity of your evidence from the standpoint of its source and the means used for gathering it.
3. Guard against the formation of opinions or premature judgments while in the process of examining evidence.
4. Keep the mind open and hospitable to new evidence on any side of the question.
5. Set up a balance sheet on each possible solution, stating your evidence for or against that course of action.
6. Weigh the relative importance of positive and negative evidence in each case. (pp. 101-104)

Dressel and Mayhew (1954) wrote about critical thinking in the decade of the '50s and characterized it as the ability to (1) define a problem, (2) select pertinent information for a solution, (3) recognize stated and unstated assumptions, (4) formulate and select relevant and promising hypotheses, and (5) draw valid conclusions and judge the validity of inferences (pp. 179-181).

Ennis (1962) noted in the early '60s that up to that point there had been a lack of careful attention to the concept of critical thinking and that no comprehensive, thorough, up-to-date treatment of the concept was available (p. 81). He described it as follows:

1. Grasping the meaning of a statement.
(2) Judging whether there is ambiguity in a line of reasoning.

(3) Judging whether certain statements contradict each other.

(4) Judging whether a conclusion follows necessarily.

(5) Judging whether a statement is specific enough.

(6) Judging whether a statement is actually the application of a certain principle.

(7) Judging whether an observation statement is reliable.

(8) Judging whether an inductive conclusion is warranted.

(9) Judging whether the problem has been identified.

(10) Judging whether something is an assumption.

(11) Judging whether a definition is adequate.

(12) Judging whether a statement made by an alleged authority is acceptable. (p. 84)

Hullfish and Smith (1961) also concluded at that time that thinking has not been honored generally in the schools; nor has the total enterprise been too imaginative. Textbooks that pile fact on fact, while neglecting—especially in the human area—the problems to which they are relevant and around which conflicting ideas and values cluster, have dominated the scene. Education has not been notably successful as a liberating, intellectual enterprise. (p. 9)

Paul (1987) notes that Passmore agreed in 1967 with these writers claiming that the object of teacher training during that period was to "turn out teachers who will firmly discourage free critical discussion" (p. 374). Popper (1965) at the same time was cognizant of the significance of critical thinking and believed it should be an educational ideal, the hallmark of intellectual inquiry, especially scientific
inquiry, stating that "criticism and critical discussion are our only means of getting nearer to the truth" (p. 151).

In the decades of the '70s, '80s, and '90s, critical thinking found its place in textbooks, journals, classrooms, seminars, curricula. In spite of the fact that it has been written about extensively and supposedly taught over these years, many continue to indict public education for the scarcity of critical thinking and are convinced that the majority of Americans still do not implement critical thinking skills in their daily lives. These skills are not easy to learn and employ and constant attention is required if one seeks to be a consistent critical thinker.

Adler (1987) suggests it may be because "teaching critical thinking challenges students personally and socially and intellectually. Consequently, educating for the development of a critical intelligence, if it is done well, faces singularly difficult hurdles" (p. 247). Sternberg (1985a) claimed that there hadn't been much improvement since Hullfish and Smith's observations of the '60s in that "the problems people really face tend to differ from those in the critical-thinking programs" (p. 194). This suggests that although critical thinking may be learned, it is not transferred to regular everyday living.

Presently there are definite glimmers of change appearing within the educational community. Critical thinking has become a movement whose epicenter is in North America. Research projects, educational manifestos, and mandates abound, and curricula are being restructured (Paul, 1990, p. 18). In 1986, the State of California instituted a graduation requirement in its 19-campus
California State University system intended to achieve "an understanding of the relationship of language to logic, leading to the ability to analyze, criticize, and advocate ideas, to reason inductively and deductively, and to reach factual or judgmental conclusions based on sound inferences drawn from unambiguous statements of knowledge or belief" (p. 1). No doubt this model will be duplicated in other states and institutions.

It is encouraging to see the following in Phi Delta Kappan, journal of a leading national education fraternity:

Today we are asking teachers to stop teaching students isolated factors, to stop emphasizing rote learning, and to stop just covering material and preparing for multiple-choice tests. Instead, we are asking them to start teaching students how to apply skills, how to understand concepts and solve problems. (David, 1991, p. 40)

It is not uncommon for many disciplines to include seminars on critical thinking at their professional meetings. This researcher has seen respiratory therapist, nurse, and conservationist conference schedules which included workshop approaches to critical thinking, and without doubt other disciplines are including speakers and offerings in critical thinking as well as their usual technical seminars and presentations. In-service workshops for elementary and high school teachers are offered throughout the country by specialists in the field. A variety of manuals and videos are available for individuals and groups to help them in their teaching and personal use of critical thinking skills. Centers for critical thinking have been established, such as The Center for Critical Thinking and Moral Critique, Rohnert Park, CA, and The Institute for Critical Thinking, Upper
Montclair, NJ. These organizations publish journals and books, produce videos, support research, and host international conferences on critical thinking. Numerous states have organizations whose goals are the furtherance of critical thinking.

**Thinking and Critical Thinking**

It is appropriate that the definition of thinking be addressed at this point. Beyer (1987) defines it in its broadest sense as "the search for meaning," the mental process by which individuals make sense out of experience (p. 16). It is a complex phenomenon involving at least three components: (1) one or more cognitive operations, (2) certain kinds of knowledge, and (3) certain attitudes or dispositions (p. 17). Chaffee (1985) describes thinking as an active, organized process directed toward a purpose and something that can be developed and improved (pp. 30-32). Ruggiero (1991) defines it as "any mental activity that helps formulate or solve a problem, make a decision, or fulfill a desire to understand. It is a searching for answers, a reaching for meaning" (p. 2). He lists mental activities such as observation, remembering, wondering, imagining, inquiring, interpreting, evaluating and judging which are included in the process of thinking and these often work in combination (p. 2).

The difference between good thinkers and poor thinkers, according to Ruggiero (1991, p. 4), is summarized in Table 7.
Table 7. Differences between Good Thinkers and Poor Thinkers.

<table>
<thead>
<tr>
<th>Good Thinkers</th>
<th>Poor Thinkers</th>
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<tbody>
<tr>
<td>- produce more ideas</td>
<td>- produce fewer ideas</td>
</tr>
<tr>
<td>- see problems from many perspectives before choosing one</td>
<td>- see problem from limited number of perspectives</td>
</tr>
<tr>
<td>- consider many investigative approaches</td>
<td>- take the first approach that occurs to them</td>
</tr>
<tr>
<td>- produce many ideas before turning to judgment</td>
<td>- judge each idea immediately</td>
</tr>
<tr>
<td>- willing to take intellectual risks, be adventurous, consider zany ideas, use imagination and aim for originality</td>
<td>- overly cautious in thinking, unconsciously make their ideas conform to the common, the familiar, and the expected</td>
</tr>
</tbody>
</table>

Ruggiero believes the human mind has two phases, producing ideas and judging ideas, and both are closely associated with critical thinking (p. 4). "Good" thinking, from his perspective, leads into or forms a foundation for critical thinking. Many authors have attempted to define critical thinking and, in addition to those included in the "Definitions" section and those already presented, the following statements may help communicate the broad aspects of critical thinking.

Hitchcock (1983) maintains that
good critical thinking keeps one from being seduced by rhetoric such as propaganda, rumor, half-truths, advertising. It can be distinguished in that it is based on reason which is self correcting as opposed to such things as intuitive hunches, feelings, tradition,
authority, habit, mystical experience, religious revelation, instinct, emotion and direct observation which are not self-correcting. (p. 3)

Siegel (1980) believes critical thinking "is best thought of as an embodiment of the ideal of rationality" (p. 8). The critical thinker is always seeking reasons for judgments, conclusions, evaluations, opinions. It is principled thinking characterized by impartiality, nonarbitrary judgment, and objectivity. In light of these qualities Siegel strongly advocates teaching students "how reasons are assessed, what principles govern such assessment and why such principles are adhered to" (p. 8).

When we are thinking critically, we step back from the forward-looking inferential path to reflect, analyze, question and doubt. Biases must be scrutinized; implicit assumptions must be brought to the fore. The price of the greater objectivity is time, effort, information, and conflict with other cognitive arms. (Adler, 1987, p. 249)

Apps (1985) believes critical thinking is prompted by a person "realizing that something is wrong, that there is a certain discomfort in one’s life, that things could be better, that a societal situation could be different" (p. 157). Often major life transitions trigger reflective thinking which result in change (Brookfield, 1987, pp. 24-25).

Critical thinking calls into question the assumptions underlying our customary, habitual ways of thinking and acting and then enables us to think and act differently on the basis of these critical questions (p. 1). In addition to being able to challenge old assumptions, critical thinkers also explore and imagine alternatives, being willing to face and fairly assess ideas, beliefs, or viewpoints.
which they have not regarded previously. They identify contradictions in arguments, "distinguish bias from reason and fact from opinion" (pp. 11-12). They are able to justify reasons for belief and can provide evidence in the support for such belief. They do not simply trust instincts.

Paul (1990) states that critical thinkers shouldn't accept as true everything taught as true. They shouldn't assume their experience is unbiased. They need to form, they are not born with, intellectually sound standards for belief, for truth, for validity. They need to cultivate habits and traits which integrate these standards into their lives. (p. 44)

Some of the characteristics Paul assigns to critical thinking include clarity, precision, specificity, accuracy, relevance, consistency, logicalness, completeness, fairness and adequacy (p. 51). An integrated critical thinker employs such strategies as thinking independently, being fair-minded, suspending judgment, being intellectually humble and having intellectual courage; also having a confidence in reason and the ability to recognize contradictions and make interdisciplinary connections and be able to transfer insights into new contexts (pp. 307-308).

Brookfield (1987) describes critical thinkers as those who appreciate creativity, are innovators, and who exude a sense that life is full of possibilities. They see the future as open and malleable, not static, and have the self-confidence to change certain aspects of their world. He, like Paul (1990), includes humility as a characteristic of the critical thinker (p. 5) and outlines four phases in the process of critical thinking. First, a trigger event prompts some type of reaction. Next is
the appraisal period where the concern is identified, followed by the exploration phase when the individual searches for ways of dealing with the life discrepancy. Finally, there is the phase where alternative perspectives are developed and new ways of thinking are employed (p. 26-27).

McPeck (1981) suggests that skepticism is critical thinking’s most notable characteristic; the ability to consider alternative hypotheses and possibilities. Skepticism requires experience and knowledge of the field in question (pp. 6-7). "Learning to think critically is in large measure learning to know when to question something, and what sorts of questions to ask. Not just any question will do" (p. 7). Astute questioning requires insight into the problem and comes from an informed questioner. In religious circles, skepticism is often equated with weak faith and questionable commitment. Individuals who are skeptical threaten the status quo and established belief and are to be discouraged or avoided.

Critical thinking is extremely important for young adults in that it is basic to their maturation as adults. Mezirow (1991b) states that "overcoming limited, distorted, and arbitrarily selective modes of perception and cognition through reflection on assumptions that formerly have been accepted uncritically is central to development in adulthood" (p. 5). Brookfield (1987) agrees. "Thinking critically--reflecting on the assumptions underlying our and others' ideas and actions, and contemplating alternative ways of thinking and living--is one of the important ways in which we become adults" (p. x).
According to Yinger (1980, p. 27), factors that can affect critical thinking are (1) knowledge and experience, (2) intellectual skills and strategies, (3) attitudes and dispositions, and (4) the thinking environment such as the teacher’s attitude and the emotional and physical setting.

Critical thinkers diligently strive to achieve autonomous thinking by weighing the alternatives with an open mind. Conclusions are eventually drawn, sometimes painfully and sometimes slowly and it is not uncommon for the critical thinker on this journey to feel very much alone. At times these conclusions contradict previous beliefs of the individual or the accepted beliefs of the masses.

Some researchers believe that critical thinking cannot be transferred from one area of thinking to another. McPeck (1981) states, "There is, moreover, no reason to believe that a person who thinks critically in one area will be able to do so in another. The transfer of training skills cannot be assumed of critical thinking but must be established in each case" (p. 7). He postulates that no one can think critically about everything. Critical thinking about an historical question requires, first and foremost, the skills of an historian, and for a scientific question the skills of a scientist (p. 9). McPeck suggests that the logic of one academic discipline is different from another and that critical thinking is subject-area specific. This idea was examined in the present study to determine whether Christians transfer critical thinking skills learned in the marketplace to their religious lives.

Swartz (1987), however, disagrees with this thesis. There are, he says, "Common practices and common skills relating to knowledge and rational belief
that cut across these broad disciplinary boundaries" (p. 270). Swartz believes the thinker uses different skills in different settings but this variation is not determined by subject areas. Therefore, teachers "should help students not only to acquire the skills of a good critical thinker but to develop facility in using them in all appropriate contexts" (p. 283). Teachers must teach for transfer, developing a "spirit of critical thinking" which enables the skills learned to be adapted and applied to the varied areas of life.

Paul (1990) holds that critical thinkers do not allow the somewhat arbitrary distinctions between academic subjects to control their thinking. When considering issues which transcend subjects, they bring relevant concepts, knowledge, and insights from many subjects to the analysis. They make use of insights into one subject to inform their understanding of other subjects. (p. 337)


Jesus saw that the "how" was more important than the "what."

So on this occasion he is interrogating his inquisitor not merely about the contents of his reading but about the manner of it. Does he read in order to confirm his prejudices, or to form his opinions? Does he read in order to confute his opponents, or to find out what and whom he ought to oppose? Does he read through the eyeglasses of tradition, everything colored by what the fathers taught, or does he read in the glad confidence that there is more light yet to break forth from God's holy Word? (Swaim, 1953, p. 16)
In Acts 8:30, also in the New Testament, Philip asks an official of the Abyssinian court who was reading the scroll of the prophet Isaiah, "Do you understand what you are reading?" In this case Philip desired that the content was clear to the reader. These two questions are asked over and over as seeking people read the Scriptures, for critical thinking skills can aid, in fact are essential, in the understanding of Scripture.

**Transformative Learning**

Some kinds of learning result in changes in the learner, stimulating action which results in a personal metamorphosis. Often this learning is triggered by a situation that is emotional and meaningful to the learner and it motivates the individual to undertake change to achieve homeostasis. This is transformative learning. It can occur in stages and can result in revolutionary change of being and thought (Cavaliere & Sgroi, 1992, p. 7).

Mezirow (1991a) describes the situation whereby traditional sources of authority are unchallenged, and the old ways of viewing the world become cherished and are sources for solace and security (p. xiii). When adults are taught to examine the paradigms in which they have been acculturated, a process of critical self-reflection occurs and this has the potential for inducing profound changes in thinking, relating, and ordering one's world. Such transformative learning results in action.
Some adults become aware that their basis for opinion, values, interpretation of the world, feelings, beliefs, means of parenting, and problem solving have been culturally assimilated rather than intentionally learned.

"Transformative learning is aimed at helping the individual become more aware and critical of assumptions in order to actively engage in changing those that are not adaptive or are inadequate for effective problem solving" (Kitchener & King, 1991, p. 159). Adults cannot, however, be totally free of the past (Mezirow, 1991b, p. 2).

The learning provided by a particular culture and that of the unique parents which individuals have had is the learning that has been rewarded. Adults can be bound by the approved ways of seeing and understanding in which they have been acculturated and this can limit further learning (Mezirow, 1991b, p. 1). The individual needs to learn to negotiate meanings, purposes, and values critically, reflectively, and rationally instead of passively accepting the social realities defined by others (p. 3). Mezirow believes:

We allow our meaning system to diminish our awareness of how things really are in order to avoid anxiety, creating a zone of blocked attention and self-deception. (p. 5)

Reflective learning involves assessment of assumptions and becomes transformative whenever assumptions or premises are found invalid and new schemes are employed to replace them.

Adults do not always undergo transformation alone, but often experience changes in groups and social movements. They learn that transformation can have
not only cognitive but deeply moral and religious motives and the support of others experiencing the same adjustments facilitates transformative change.

Kitchener and King (1991) acknowledge that transformative learning which leads to developmental change does not occur without disequilibrium and can be uncomfortable and even frightening (p. 168). They allow that since "transformative learning is aimed at helping the individual become more aware and critical of assumptions in order to actively engage in changing those that are not adaptive or are inadequate for problem solving it can often bring stress" (p. 159).

A classic example of transformative learning resulting in struggle is that of Freire who attempted to increase adult literacy throughout Brazil prior to the military coup of April 1, 1964, which eventually resulted in his exile. Freire saw the people as being objects instead of subjects of their own history. His efforts in Brazil, and later Chile, became models for numerous grass roots efforts throughout the United States (Heaney & Horton, 1991, p. 84).

To the extent that man loses his ability to make choices and is subjected to the choices of others, to the extent that his decisions are no longer his own because they result from external prescriptions, he is no longer integrated. Rather, he has adapted. The integrated person is person as subject. In contrast, the adaptive person is person as object adaptation representing at most a weak form of self-defense. If man is incapable of changing reality, he adjusts himself instead.

Adaptation is behavior characteristic of the animal sphere; exhibited by man, it is symptomatic of his dehumanization. (Freire, 1973, p. 4)

Freire helped the people intervene in the decisions that affected their lives instead of being onlookers. The changes were difficult.
The new perceptions did not prevail easily or without sacrifice; the old themes had to exhaust their validity before they could give way to the new. Thus the dynamic of transition involved the confusion of flux and reflux, advances and retreats, and those who lacked the ability to perceive the mystery of the times responded to each retreat with tragic hopelessness and generalized fear. (p. 9)

Another notable facilitator for transformative learning was Horton, who founded the Highlander Folk School in Tennessee in the early 1930s. He helped adults in the South learn about issues which impacted their communities and subsequently witnessed their empowerment to initiate action to change unjust systems (Highlander Research and Education Center, 1989, Introduction). Education plus group support enabled individuals to experience the exhilaration, the pain, the responsibility, the liberation, and reward of being agents of change. The transformative learning which took place at Highlander rippled far beyond its boundaries.

Many other examples can be enumerated where adults, as a result of emancipatory education involving critical thinking skills, were seen to express their new beliefs in collective action. The women’s movement is a national example, the struggles in South Africa an international one. In many cities and communities across America transformed adults are involved in change. "A mind that is stretched to a new idea never returns to its original dimensions" (Oliver Wendell Holmes).

The critical thinking that Mezirow (1991a) believes leads to transformation is concerned with assessing the basis for what a person does, justifying decisions,
and having reasons for belief. Critical thinking, he says, is informed by reflection and indeed is the same as reflective learning (p. xvii). Kitchener and King (1981) have researched the progression adults take in moving toward reflective thinking, or reflective judgment as they term it. They suggest that adults develop an increased ability to evaluate knowledge and defend ideas and opinions and follow a seven-stage model which expresses a sequence of increasingly complex methods of justification of beliefs. It demonstrates how people's conception of the nature of knowledge, of reality, and their concepts of justification change over age and educational levels. How do people explain and justify their beliefs? How does one arrive at a particular point of view, and why does one hold that view instead of an alternative view? The seven-stage model is summarized, in brief, in Appendix H. It is grounded in the underlying assumptions of the cognitive development perspective as expressed by Piaget and Kohlberg and reflects assumptions about the process of learning to think and reason (King, 1992, p. 6).

Belief and Belief Change

Background

In the English vocabulary of the late 20th century the terms attitude, opinion, knowledge, faith, and belief and even the word religion are often used interchangeably and definition distinctions can be blurred. To help clarify the meaning of belief, the other terms will first be discussed and belief then seen in contrast to them.
**Attitude.** The term "attitude" has many meanings, ranging from an ethical principle of doing unto others as we would have them do to us to a pronounced feeling of being for or against something (Dressel & Mayhew, 1954, p. 210). It is linked to the affective or emotional domain and may be held and based solely on an emotional feeling, being completely uninformed.

Wyer and Goldberg (1970) state, "Beliefs and attitudes may both be considered to be statements concerning either the membership of an element in a given category, or of the relationship between members of different categories" (p. 102). They define a category as a verbal symbol which is used to represent one or more cognitive elements such as objects, events, or ideas. Rokeach (1976) defines an attitude as a "relatively enduring organization of beliefs around an object or situation predisposing one to respond in some preferential manner" (p. 112).

Most researchers into attitude study agree that attitudes (a) develop through experience with an object, (b) predispose one to act in a predictable manner with respect to an object, and (c) consist of positive and negative evaluations (Palmerino et al., 1984, p. 179).

Wyer and Goldberg (1970) make no theoretical distinction between attitudes and beliefs. "Fundamentally, ... a subject's reported attitude toward an object is interpretable in terms of his judgment of the object's membership in a cognitive category. To this extent, it is no different from a belief" (Wyer, 1974, p. 24). Giere (1984) states, "The primary use of the word 'belief' is to refer to an
attitude of some person toward the truth of a particular statement" (p. 24).

Rokeach (1976) maintains that there is little consensus about the exact meaning of a belief or attitude or value system (p. x). It is difficult to clearly distinguish between attitude and belief throughout the literature, as some authors define them separately and some use the terms interchangeably.

Allport, as quoted by McGuire (1969) and Wyer (1974), defines attitude as "a mental and neural state of readiness, organized through experience, exerting a directive or dynamic influence upon the individual's response to all objects and situations with which it is related" (p. 24). Kiesler, Collins, and Miller (1969) point out that attitudes, unlike opinions, are not restricted to verbalization and that they include unconscious or nonverbalizable avoidance tendencies. Individuals faced with a challenging question can respond explicitly in one manner to another individual and give a different implicit response to themselves (p. 104).

Some believe that attitudes can be developed or modified through knowledge, but data shows there is a low correlation between attitudes and knowledge and it appears that "attitudes toward and knowledge or thinking about the same matters can develop quite independently of each other" (p. 241). In the final analysis, they are a matter of individual conscience (p. 240).

To Gordon (1971), attitudes are "less stable dispositional relationships within certain aspects of the individual's experience" (p. 246), and they may or may not be consistent with beliefs and are reflective of the individual's psychobiology. He agrees with Dressel and Mayhew (1954) that attitudes are closely related to
personality. Gordon (1971) believes attitudes can shift with more ease than can beliefs, and the factors which appear to influence them are one’s experiences, especially those with high emotional content, one’s education and indoctrination, and the novelties in one’s perspective of his relationship to society, caused in any manner (p. 246). Zaltman, Kotler, and Kaufman (1972) believe that attitudes are firmly grounded in the groups to which an individual belongs (p. 79).

Palmerino et al. (1984) suggest that mindfulness-mindlessness theory can be instructive in increasing understanding of attitudes. This theory is based on the proposition that similar actions can be accompanied by vastly differing degrees of cognitive activity. Much of human activity which appears to be thoughtful and intentional is in fact conducted in what has been called a mindless fashion. Mindlessness is a state of reduced cognitive activity whereby the individual processes cues from the environment rather automatically without paying much attention, and it is the pervasive condition. Examples of mindless behavior would be knee-jerk liberalism, blind bigotry, and nonconscious ideologies. They are the product of routinized, relatively automatic cognitive processes and are quite stable.

Mindfulness, by contrast, is a state where conscious, active information processing occurs. Novelty and newness breeds mindfulness and it is less stable, resulting often in change.

Mindless interaction with the environment places individuals in the position of “reacting” and being “forced” to take certain actions. They are reacting to an already preformed structure that the situation seems to demand. In contrast, individuals behaving mindfully are in the process of actively constructing an environment.
In erecting this structure there is less reaction and more reasoning and pursuing of objectives. (p. 186)

Mindful functioning often leads to attitude change as an individual becomes cognizant of inconsistencies or data heretofore unconsidered.

This theory may be helpful in understanding an individual's attitudes of a religious nature. Where mindfulness is encouraged, beliefs and attitudes result from conscious choice and are open to modification. Mindlessness results in static attitudes which are based less on cognitive assessment, and the individual deals with an already constructed environment, responding in a routinized fashion.

**Opinion.** Opinions can be differentiated from attitudes in that they are articulated more readily. They help an individual respond to a situation when more than one response is possible and may or may not be logically consistent with attitudes. They are "direct, usually malleable dispositions towards an object, institution, person or artifact in the individual's world of perception, mediated to him in any manner" (Gordon, 1971, p. 246). McGuire's (1969) comparison of opinion with attitude is shown in Table 8.

Rokeach (1976) sees opinion as a verbal expression of some belief, attitude, or value, and he suggests that not all verbal expressions can be taken at face value for people do not always reveal their true underlying beliefs, attitudes, or values. There is a distinction between public and private attitudes, and opinions typically represent public attitudes, beliefs, or values. Under conditions of more privacy private opinions may be expressed (p. 125). Opinion can be arrived at casually,
Table 8. Comparison of Opinion and Attitude.

<table>
<thead>
<tr>
<th>Opinion</th>
<th>Attitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>More specific manifestation of the broader attitude</td>
<td>More general orientation</td>
</tr>
<tr>
<td>Beliefs dealing with one's experiences or predictions about events</td>
<td>Beliefs dealing with one's wishes, hopes or desires about events</td>
</tr>
<tr>
<td>Object judged on a dimension other than an evaluative one</td>
<td>Object judged on evaluative (good-bad) dimension</td>
</tr>
<tr>
<td>Overt expression of covert attitude</td>
<td>Covert attitude; not always verbalized</td>
</tr>
</tbody>
</table>

with or without examining the evidence (Ruggiero, 1975, p. 40), thus possibly being superficial and groundless; yet it can also be measured and justified and the result of long and thoughtful inquiry.

Paul (1990) defines opinion as "a belief, typically one open to dispute. Sheer unreasoned opinion should be distinguished from reasoned judgment--beliefs formed on the basis of careful reasoning" (p. 563). The persistent interrelationship between these words of interest, in this case belief and opinion, should be noted.

Knowledge. How does knowing differ from believing and these other terms? Quinton (1967) maintains that "the nature of knowledge has been a central problem in philosophy from the earliest times" (p. 345). Giere (1984) suggests that part of knowing is believing for we all believe many things we would never claim to
know. The distinction is the justification, the basis for holding the belief. If the reasons are strong and proven, one knows. If the reasons are lacking or incomplete, one believes. Knowledge requires reasons or justification (p. 26).

The scientific method is the means by which scientific knowledge is justified. It can be empirically demonstrated. However,

It is one of the major themes of 20th-century thought that science cannot provide an absolute guarantee of the truth of its conclusions . . . The fact that there is no absolutely perfect justification does not mean that some scientific justifications are not better than others. One must learn to live without guarantees and to distinguish carefully between better and worse justifications. (Giere, 1984, p. 28)

If a person knows that a statement is true, then (a) the person believes it is true, (b) the person is justified in so believing, and (c) the statement is in fact true. Justification is most important and most characteristic of knowledge (Giere, 1984, p. 27). Is it supported by data, good reasoning, documentation, authentic sources, many witnesses? Quinton (1967) defines knowledge as "justified true belief" and states that one can have knowledge only of what is true (p. 345).

Knowledge must not be confused with belief. Humans can believe things which are false, or believe them and not know them to be true. "Our fervent beliefs we confuse with knowledge or proof, our emotionally-held opinions with convictions, our stubbornness with determination, our judgmentalism with judgment, our point of view with reality" (Paul, 1990, p. xvi). Paul continues, "We confound fact and opinion, data and interpretation, evidence and conclusion,
information and knowledge" (p. xvi) and we do it with ease, both individually and collectively. Social life and individual life fosters these illusions.

Knowledge is "the act of having a clear and justifiable grasp of what is so or of how to do something. Knowledge is based on understanding or skill which in turn are based on thought, study, and experience" (Paul, 1990, p. 557). Paul carefully distinguishes knowledge from the ability to recall and clarifies that knowledge is not sharing information from one person to another. "Genuine knowledge is inseparable from thinking minds . . . knowledge is produced by thought, analyzed by thought, comprehended by thought, organized, evaluated, maintained, and transformed by thought" (p. 558).

Duchesne-Guillemin (1987) states that "exactly what constitutes religious knowledge is problematic. Strong belief . . . may be subjectively indistinguishable from knowledge" (p. 343). The Apostle Paul declares in the letter to the Ephesians (3:18-19) in the New Testament that the ultimate object of a Christian's knowledge, the wide, long, high, deep love of Christ, passes knowledge. Many Christian writers such as Theodoret of Cyrrhus of the 4th-5th century suggest that one must first believe and understanding (knowledge) follows (Duchesne-Guillemin, 1987, p. 347). Saint Anselm (1033-1109) reasserted the basic Augustinian position: "I do not seek to understand that I may believe, but I believe, in order to understand" (Wells, 1962, p. 199).

Paul (1990) indicts public education for not challenging students to ask for justification for what they are taught and expected to believe, and these
characteristics may be seen in some Christian education settings as well. Students may not be encouraged to question, challenge, doubt. When an authoritarian environment prevails, learning tends to be passive. Mindlessness may be operative. When a minister or priest delivers sermons or homilies, often there is little or no opportunity for questions, dialogue, or alternative opinion. In a classroom setting, whether church, private school, or home, curricula are often designed around dogmatic agendas and opposing viewpoints eschewed.

Mindfulness may not be encouraged.

Paul (1990) quotes Mill, who stated with reference to knowing, "The only way in which a human being can make some approach to knowing the whole of a subject, is by hearing what can be said about it by persons of every variety of opinion, and studying all modes in which it can be looked at by every character of mind" (p. 10). The justification for such knowledge would be substantiated and well grounded. "All reality is illumined and made more real for me by different views from different perspectives. Hence, whenever we connect to images, bringing them into stereoscopic focus, our grasp of reality is greatly enriched--literally given more body and substance" (Roy, 1981, p. 17).

Often "having knowledge is reduced to believing what those around us believe" (Paul, 1990, p. xvi). Paul maintains that it is not surprising that societies perceive themselves committed to objectivity, reason, and rational learning, but only a small minority actually recognizes how rare these values are and how dominant is the presence of irrationality and collective self-delusion.
Knowledge is difficult to define because it deals with justified belief which is presumed true yet may subsequently be proven false. Also, the justification can be based on subjective analysis. What is firm justification to one person may be weak to another.

Faith. Smith (1979) has researched in depth the meaning of faith and how it should be differentiated from belief.

In Western, especially Christian, and especially modern development, there has been a tendency to use the two terms interchangeably, as though belief and faith were the same thing. When one considers the matter on a more global scale, however, it quickly becomes apparent that they are not. (p. 10)

Beliefs differ radically throughout the many world religions whereas faith is more consistent. Various religions, or the denominations within Christendom, delineate their beliefs or creeds and there is considerable variation, and beliefs of an individual can undergo change throughout the lifespan.

In Western society when one asks "What faith are you?" or "What religion are you?" one really means "What do you believe?" Individuals are described as believers, which also means that they are persons of faith or religious. "I believe the Bible is true" to many is the same as "I have faith that the Bible is true" or even "I know that the Bible is true."

Fowler (1981) quotes Smith's definition of religion as "a cumulative tradition" and suggests it is the various expressions of the faith of people in the past.
A cumulative tradition may be constituted by texts of scripture or law, including narratives, myths, prophesies, accounts of revelations, and so forth; it may include visual and other kinds of symbols, oral traditions, music, and a host of other elements. Like a dynamic gallery of art, a living cumulative tradition in its many forms addresses contemporary people and becomes what Smith calls "the mundane cause" that awakens present faith. (p. 9)

Fowler perceives faith as being deeper and more personal than religion, and sees it as "the person's or group's way of responding to transcendent value and power as perceived and grasped through the forms of the cumulative tradition" (p. 9).

Ideally, both faith and religion interact and are renewed and grow through this reciprocity. As faith is awakened and nurtured by the tradition, the tradition in turn is extended and modified through the fresh faith of new adherents, gaining vitality (Fowler, 1981, p. 10). Fowler believes controlled change is necessary for traditions to thrive and for deep and lively faith.

Faith is described by various authors (Tillich, Smith, Van Till, Wells, Bultmann, Fowler) using action terminology: engagement, involvement, encounter, commitment, risk, growth, participation, surrender, struggle, quest, stepping-out, contribution, life-giving, responsibility, accountability. The 11th chapter of Hebrews in the New Testament is traditionally referred to as the "faith chapter." It delineates many personages of the Jewish heritage and heralds their faith. The action verbs are notable: Abel offered, Enoch pleased, Noah prepared, Abraham went out, Jacob worshipped, Moses chose, Rahab received, etc.

The writer to the Hebrews states, "Without faith it is impossible to please him" (1:6), and in the book of James it declares, "Faith, without deeds, is dead. I
will show you my faith by what I do" (2:17-8). Action is required. In reference to Abraham's faith James states, "You see that his faith and his actions were working together, and his faith was made complete by what he did" (2:22). It was not complete by what he believed.

James also points out that even the demons believe (2:19). There is no particular significance to this as Thomas Aquinas explains: "The demons are, in a way, compelled to believe by the evidence of signs and so their will deserves no praise for their belief as they are compelled to believe by their natural intellectual acumen. (Summa theologiae)" (Duchesne-Guillemin, 1987, p. 349). Belief, by itself, is vacuous, purposeless.

While beliefs vary among religions and with the era, faith, in contrast, is similar across the ages and the religions of the world. Within an individual's life journey it is always developing and growing but its essence remains constant. Fowler (1981) has identified stages of faith through which an individual may travel. He describes the undifferentiated faith of infancy, the intuitive-projective faith of early childhood, the mythic literal faith of the school years. In adolescence the synthetic-conventional faith is expressed, in young adulthood the individuative-reflective faith, in mid-life and beyond the conjunctive faith. Finally, Fowler describes universalizing faith which few attain. He does not infer that the higher stages are better but that each stage has a potential for wholeness, grace, and integrity, and for strengths sufficient for either life's blows or blessings. There is room for belief variance within all the faith stages but the essence of faith, its
commitment and involvement, however it is expressed, remains constant from person to person.

Tillich (1957) speaks to the constancy of faith and the transience of belief: "The incomplete certitude of belief remains and can be undercut at any moment by criticism and new experience. The certitude of faith has not this character" (p. 34).

He clarifies faith in that it is not "an act of knowledge that has a low degree of evidence" (p. 31), a common misinterpretation, or of "subjective emotions, without a content to be known and a demand to be obeyed... Faith as the state of ultimate concern claims the whole man and cannot be restricted to the subjectivity of mere feeling. It claims truth for its concern and commitment to it" (p. 39).

Faith is not whimsical or merely an invention of human feelings. Rue (1993) accuses those who only look at Hebrews 11:1 (Faith is being sure of what we hope for and certain of what we do not see. New International Version, p. 1262) and fail to see the whole definition of faith in Hebrews of "elevating 'belief against the evidence' to the status of a virtue" (p. 17).

Fowler (1981) asks questions which penetrate to the meaning of faith. Note again the reference to action. The connection to Tillich's "ultimate concern" is obvious.

1. What are you spending and being spent for? What commands and receives your best time, your best energy?

2. What causes, dreams, goals or institutions are you pouring out your life for?
3. As you live your life, what power or powers do you fear or dread? What power or powers do you rely on and trust?

4. To what or whom are you committed in life? In death?

5. With whom or what group do you share your most sacred and private hopes for your life and for the lives of those you love?

6. What are those most sacred hopes, those most compelling goals and purposes in your life? (p. 3)

These are questions of faith. They aim to help us get in touch with the dynamic, patterned process by which we find life meaningful. They aim to help us reflect on the centers of value and power that sustain our lives. The persons, causes and institutions we really love and trust, the images of good and evil, of possibility and probability to which we are committed—these form the pattern of our faith. (pp. 3-4)

When compared to belief, Smith (1979) states,

Faith is deeper, richer, more personal. It is engendered and sustained by a religious tradition, in some cases and to some degree by its doctrines; but it is a quality of the person, not of the system. It is an orientation of the personality, to oneself and to one’s neighbor, to the universe; a total response; a way of seeing whatever one sees and of handling whatever one handles; a capacity to live at a more than mundane level; to see, to feel, to act in terms of, a transcendent dimension (p. 12).

Within the literature, the following profound description of faith by Smith is regularly quoted:

Faith, then, is a quality of human living. At its best it has taken the form of serenity and courage and loyalty and service; a quiet confidence and joy which enable one to feel at home in the universe, and to find meaning in the world and in one’s own life, a meaning that is profound and ultimate, and is stable no matter what may happen to oneself at the level of immediate event. Men and women of this kind of faith face catastrophe and confusion, affluence and sorrow, unperturbed; face opportunity with conviction and drive; and face others with a cheerful charity. (p. 12)
Tillich (1957), similar to Smith, sees faith as action, not in connection with theoretical knowledge.

The Christian may believe the Biblical writers, but not unconditionally. He does not have faith in them. He should not even have faith in the Bible. For faith is more than trust in even the most sacred authority. It is participation in the subject of one's ultimate concern with one's whole being. Therefore, the term 'faith' should not be used in connection with theoretical knowledge, whether it is a knowledge on the basis of immediate, prescientific or scientific evidence, or whether it is on the basis in authorities who themselves are dependent on direct or indirect evidence. (p. 32)

Bultmann expresses faith as:

The abandonment of man's own security and the readiness to find security only in the unseen beyond, in God. This means that faith is security where no security can be seen; it is, as Luther said, the readiness to enter confidently into the darkness of the future. Faith in God who has power over time and eternity, and who calls me and who has acted and now is acting on me—this faith can become real only in its "nevertheless" against the world. For in the world nothing of God and of his action is visible to men who seek security in the world. We may say that the Word of God addresses man in his insecurity and calls him into freedom, for man loses his freedom in his very yearning for security. This formulation may sound paradoxical, but it becomes clear when we consider the meaning of freedom. (Johnson, 1987, p. 303)

Dobzhansky (1967) quotes theologian Heim who describes the results of faith as well as its subtle nature. It

gives us the strength we need in everyday life, not when it is sustained by miraculous occurrences breaking through the order of nature . . . but only when one and the same occurrence, an occurrence of which we fully understand the natural causes . . . at the same time in itself appears to us as an act of God, which we receive directly from his hands. (p. 25)
This working strength is also expressed by Helfaer (1972) who describes the essential certitude, meaningfulness, and hopefulness of the person of faith who has a "rallying point to which he can gravitate in the face of doubt or crisis" (p. 2).

Fowler (1981) admits that the best attempts to define faith fall short because of its transcendent dimension.

Faith development theory, focusing resolutely on the human side of the faith relationship, comes up against the fact that the transcendent other with whom we have to do in faith is not confined by the models we build or to the patterns we discern. In the biblical tradition, at its best, the radical freedom of God is a central and indispensable testimony. God is recognized as sovereign reality—a creator, ruler, and redeemer of all being. (p. 302)

Fowler acknowledges with humility the role of grace and revelation, the initiatives on God's part, which play a more mysterious and unpredictable role in whether there is faith on Earth.

"Augustine grappled with the timeless problems of meaning in life and free will to the conclusion that faith precedes all forms of understanding, and that all material and intellectual phenomena arise from the truth of God" (Gordon, 1971, p. 60).

Belief

Definitions. All of the previous phenomena, attitude, opinion, knowledge, religion, and faith have skirted belief or have seen belief interwoven into the fabric of their meanings. How can belief be distinguished from the rest? It is deeply influenced by the emotional, sociocultural, and psychological dimension of one's
life. All of these in turn relate to personality. The Oxford Dictionary defines belief as "the mental action, condition, or habit of trusting to or confiding in a person or thing" (Rizzuto, 1980, p. 116).

Smith (1979) describes belief as "the holding of certain ideas" (p. 12). He uses the term strictly as an activity of the mind and it follows that one could easily believe without having faith. However, belief could be one among many of the overt expressions of one’s faith. Belief induces faith, nurtures it, gives it shape and force and depth and richness (p. 19).

Dewey (1933) defines belief as being something beyond itself by which its value is tested; it makes an assertion about some matter of fact or some principle or law. It means that a specified state of fact or law is accepted or rejected, that it is something proper to be affirmed or at least acquiesced ... It covers all the matters of which we have no sure knowledge and yet which we are sufficiently confident of to act upon and also the matters that we now accept as certainly true, as knowledge, but which nevertheless may be questioned in the future—just as much that passed as knowledge in the past has now passed into the limbo of mere opinion or of error. (p. 6)

Most beliefs cannot be proven. They are ideas which have been assimilated from or taught by others and are accepted or "believed" because they are generally accepted or "believed" by the society or group to which an individual belongs. Beliefs can be carefully taught or indoctrinated or they can be assimilated unconsciously, insinuating themselves into the mind, becoming part of the mental baggage. Dewey notes that such thoughts are prejudices, or prejudgments, not conclusions reached as the result of personal mental activity such as observing,
collecting, and examining evidence. If such prejudgments happen to be correct, it is completely accidental (p. 7).

Hullfish and Smith (1961) also suggest one can hold beliefs without having thought about them. "The conditioning effect of our culture, our milieu—indeed, of life itself—is such that all of us come to believe many things without engaging in reflective activity" (p. 52). "Any pattern of belief which is formed as a result of an unthinking or conditioning process may be called a prejudice. All such beliefs are unreasoned; not all of them, however, are unreasonable" (p. 109).

Dewey (1933) explains that "active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusions to which it tends constitutes reflective thought" (p. 9). This is when belief is established on a foundation of evidence and rationality. Reflection implies that something is believed, not on its own direct account, but through something else which stands as witness, evidence, proof, voucher, warrant; what Dewey calls ground of belief (p. 11).

Paul (1990) notes:

We can easily believe for irrational reasons: because those around us believe, because we are rewarded for believing and punished for doubt, because we are afraid to disbelieve, because belief serves our vested interest, because we are more comfortable with belief, because we have ego-identified ourselves, our image, or our personal being with belief. In all of these cases, our beliefs are without rational grounding, without good reason and evidence, without the foundation a rational person demands. (pp. 13-14)
To Quinton (1967), belief is "an inner state of the mind, directly accessible to introspection and distinct from, though casually related to, the believer's behavior" (p. 351). There is considerable controversy by philosophers over whether belief should be defined in terms of behavior, or whether it is active or passive. Descartes contended that assent is a matter of will while Hume felt it was an emotional condition in which one finds oneself. Bain urged that belief should be interpreted in terms of tendencies to action, and Peirce viewed it as an unobstructed habit of action which comes to our notice only when we have lost it (p. 345).

Beliefs are subject to the pressure to represent truth. James (1956) declares,

Belief is desecrated when given to unproved and unquestioned statements for the solace and private pleasure of the believer . . . If belief has been accepted on insufficient evidence the pleasure is a stolen one . . . It is wrong always, everywhere, and for everyone, to believe anything upon insufficient evidence. (p. 8)

Pojman (1992), in discussing the ethics of belief, gives warning to the grave responsibility we all have to gather the best evidence available. We are responsible, he asserts, for many of the beliefs that we have, and since beliefs guide action, they may harm or help our fellow humans (p. 447).

Mahoney (1974) admits to the illusiveness of an unambiguous definition of belief and notes that among social psychologists there is a wide range of definitions. He quotes Bem's definition: "A man's beliefs and attitudes have their foundation in four human activities; thinking, feeling, behaving, and interacting with others" (p. 229).
Mahoney describes Bem's model of primitive beliefs and higher-order beliefs. The former are implicit "leaps of faith" which do not require experiential confirmation in formal defense. The latter may require one or both of these (p. 229). It is significant that a focus in most definitions of belief expresses some behavioral outcome, or willingness to act, or predicted performance. "The 'strength' (degree, confidence) of a belief is reflected in the frequency and form of the action it occasions" (p. 229).

Mahoney reports that social psychology's attempts to define belief have not progressed far beyond that of philosopher Peirce (1878) who defined belief as "a rule for action" having three components: cognitive, emotional, and behavioral. He maintained that a belief entailed sensations to be expected and behavior to be prepared (Mahoney, 1974, p. 229). Indeed, Rokeach (1976) similarly lists the three components for belief as cognitive (represents a person's knowledge), affective (can arouse emotion of varying intensity), and behavioral (can lead to action) (pp. 113-114).

Rokeach (1976) quotes Jastrow who declares that the human mind "is a belief-seeking rather than a fact-seeking apparatus" (p. 113). Rokeach suggests seven questions which could facilitate an understanding of the nature of the human belief system:

(1) What structural properties do all belief systems have in common, regardless of content?

(2) How do belief systems structurally differ from one another?
(3) How are belief systems developed and learned?
(4) What motivational functions do belief systems serve?
(5) What is the relation between belief and emotion (cognition and affection)?
(6) How do belief systems guide thinking, learning, acting?
(7) What conditions facilitate or hinder belief modification? (p. 2)

Kitchener and King (1981) point out that the grounds for some people’s religious belief are quite different than the bases for others’ religious beliefs. Some belief is based on unexamined reliance on the authority of others while others’ belief is grounded on thoughtful examination and evaluation of available evidence (p. 90). This widely divergent means by which people justify belief adds to the difficulty in defining belief. A belief which has withstood rational assessment comes closer to truth whereas belief that has not been critically reviewed would be vigorously challenged by those sincerely seeking truth.

Wittgenstein (1992) suggests that religious belief is different from other kinds of belief. Normally, if one does not believe in something there is nothing wrong with that position, but with religious belief, not believing is regarded as something bad (p. 396). He also states that religious belief means much more than normal belief. One might say, "I believe it will snow tomorrow" and this is taken by others as a possibility, probably based on some evidence. There is room for error. But to say, "I believe in the bodily resurrection or the substitutionary atonement of
Jesus" infers much more. It is said with conviction and assurance and is almost equivalent to the ordinary use of the word "know."

Hicks (1992) understands this extraordinary definition of belief by religious people.

God was not, for Amos or Jeremiah or Jesus of Nazareth, an inferred entity but an experienced personal presence. If this is so, it is appropriate that the religious man's belief in the reality of God should be no more provisional than his belief in the reality of the physical world. (p. 410)

This form of belief hovers very near to the conventional definition of knowing.

Christianity verifies its beliefs by pointing to the resurrection of Jesus as its ultimate grounds for truth, but the perennial existence of the church, against all odds, and the changed lives of people give grounds for belief as well.

**Etymology of Belief.** The Latin word "credo" from which the English word "creed" derived originally meant "I set my heart on," "I give my heart to," "I hereby commit myself," or "I pledge allegiance." There was action and commitment, involvement, dedication, and transformation associated with the term. Credo is a compound from cor, cordis, "heart," as in such words as "cordial" and "accord" and the Greek kardia, as in "cardiac" or "electrocardiogram," and do meaning "put," "place," "set," or "give." Credo's first meaning in classical Latin was "to entrust," "to commit," and even "to lend," the origin of the word credit (Smith, 1979, p. 76).

As the centuries rolled, credo came to be regarded as an act in which the mind played a dominant role. St. Thomas Aquinas' influence in integrating the life
of the mind with the life of faith contributed to this change. For him, credo was an act of the mind in which the will was explicitly involved and credo was the pledging of allegiance, the committing of oneself, through one's mind; loyalty to truth. He saw faith as being closer to knowing and set it up as within a series along with belief and a certain type of knowledge, standing somewhere between these two. Faith and belief were unique but intertwined (pp. 79, 85).

St. Thomas recognized that beliefs differed but that faith was nonetheless always and everywhere the same. Smith summarizes his stand stating, "His own beliefs were those of a 13th-century Christian. His understanding of faith, on the other hand, though articulated within the framework of those beliefs, was universal" (p. 91).

In more recent centuries, as a result of the various challenges faced by the church in its multitudinous environments, the distinction between the definitions of faith and belief have become clouded. Belief has become the content of faith. Faith has become "belief plus." An anti-intellectualist milieu which stresses feeling more than intellect influenced these changes. Smith traces the lineage of credo when it first meant deep commitment and personal allegiance to its present meaning "to believe."

A major shift in the meaning of the English word "believe"... not only has... occurred over the centuries, as can be demonstrated, but also has proven of massive consequence and fateful significance... so deeply embedded is the term in Western religious life and thought, and so central has it remained. (p. 105)
Believe began as "to belove," "to hold dear," "to cherish." It meant what faith means today.

The changes in the meaning of the word credo can be traced in the translations of the Bible into English.

In the three and a half centuries since the King James Authorized Version, the word "faith" has not altogether lost its original spiritual meaning, but the words "belief" and "believe" have. One might therefore urge that "belief/believe" be dropped as religious terms since they no longer refer directly to anything of human ultimacy. (p. 117)

Smith suggests the modern world would do well to rediscover what faith means—what believe used to mean—to care, to trust, to cherish, to commit.

In fact, belief in its modern conception, instead of serving as an avenue to faith, may have become an obstacle to it.

The 20th century has seen many persons in the Western world whose potentiality for faith, far from being crystallized around belief, has, rather, been poignantly precluded by it. Instead of being a stepping-stone to faith, religious belief had become a barrier. The Church gave men and women the impression that believing was the price they must pay; and for the sensitive, that price was too high. (pp. 123-124)

What used to be transforming has been reduced to a mundane operation of the mind. One can only wonder how many people have been thwarted in their search for faith as they were forced to accept certain beliefs. Bible-believing is the way some describe their traditions. Bible-faithing might be more engaging, more difficult, more risky, more Christian. "Faith is not belief in a doctrine . . . it is
'assent' to the truth as such, in the dynamic and personal sense of rallying to it with delight and engagement" (p. 168).

The object of faith used to be a person; the object of believing is an idea or theory. The act of faith used to be a decision of cosmic self-commitment; the act of believing has come to be a descriptive, if not passive condition (p. 120). To modern Christians, belief seems to take pre-eminence. What one believes is more important than how one lives or expresses one's faith commitment. Faith, as here described, an action, is subordinated to belief, an intellectual activity.

Belief and faith have been linked more closely by Western Christians than any other group. Doctrine, a central expression of faith, has often seemed a criterion of it. The community has divided over belief differences and belief has been set as a formal qualification for membership (pp. 13-14). For Christians, theology has become a conspicuously important matter. Doctrine dominates. Particularly within the more fundamental milieu new churches or Christian colleges and academies are sometimes formed as a result of disagreements in one area of belief, such as how or when baptism is performed or whether one is a premillennialist, postmillennialist, or amillennialist or how an issue such as abortion is viewed. Even the history of creationist organizations shows a variety of schisms, usually based on some fine point of belief (Numbers, 1982, pp. 541-542). Mainline denominations have also had schisms based on belief, most notably in recent decades over the ordination of women as elders or pastors. Faith, or how
individuals live out their Christian convictions, does not seem to be as important. Shallow faith is more conveniently overlooked than is incorrect belief.

In other religions it may not have occurred to the religious that as evidence of his faith a person should believe something. They may have dances or rituals or laws or symbols instead (Smith, 1979). That Christianity is different in this respect is quite acceptable but the suggestion is that these subtle changes in what is pre-eminently important should be recognized and rectified. "Whatever may be the case with other religions, Christianity has always been a personal religion demanding personal commitment to a personal way of life" (Braithwaite, 1991, p. 350). "The intention of a Christian to follow a Christian way of life is not only the criterion for the sincerity of his belief in the assertions of Christianity; it is the criterion for the meaningfulness of his assertions" (p. 344).

Hullfish and Smith (1961) suggest believing is "a form of activity which the general expression thinking covers" (p. 49). They recognize that beliefs have been caused, they don't arrive out of the blue. The causes, grounds, and justifications for belief are of importance to all educators including Christian educators, whether they be parents, pastors, church school or communicants' teachers.

In Scripture, "to believe" denotes the criterion of right relationship with God. It means to hold on to something firmly, with conviction and confidence. "It is implied that steadfastness is sought in the object believed, and that in laying hold of the object, the believer himself will become steadfast" (Richardson, 1950, p. 75). Regarding religious belief, Helfaer (1972) states, "The religious belief system . . . is
the individual’s most general and condensed definition of himself and his environment, and it also has intimate connections with the basic psychodynamic processes which organize and direct unconscious motivational energy" (p. 5).

Rizzuto (1980), states with respect to belief in God, "In the act of believing, the individual finds himself or herself psychologically 'bound' to believe in or to reject a God with whom there has been a prolonged private relation" (p. 117). He concludes that belief is not a final state, that its presence depends on a combination of factors including objects and people from the past, the individual’s personal history, present expectations of the environment and whole personality. He concurs with Freud that "all belief is the conviction about 'historical truth'" (p. 133).

All of a person’s experiences and identifications, his struggles and his victories, his self-identity, his world view, his conscience and values are reflected in his religious belief system. Modification of belief comes slowly, requiring considerable effort or experience, or quickly, as the result of a shock or experience of traumatic dimensions, or both (Gordon, 1971, p. 246).

Belief Theory. "Any belief may be described as a configuration or pattern of meaning which has become more or less fixed. When a belief is held as a hypothesis . . . the configuration is held tentatively" (p. 52). When beliefs become well grounded and justified then they can be classified as knowledge. Beliefs may be "fixed" by a single emotional experience, by prolonged and intense conditioning through propaganda (persuading by emotional appeal rather than by rigorous
argument), irrelevant or inaccurate evidence, fallacious arguments, or by thoughtful validation. Within fairly wide limits, people have the power to believe what they want to believe and there is no direct connection between belief and truth (Giere, pp. 24-25).

Rokeach (1960) employs the term belief-disbelief system in analyzing belief, suggesting that for every system of beliefs one accepts there are a series of systems that have been rejected.

The belief system is conceived to represent all the beliefs, sets, expectancies, or hypotheses, conscious and unconscious, that a person at a given time accepts as true of the world he lives in. The disbelief system is composed of a series of subsystems rather than merely a single one, and contains all the disbeliefs, sets, expectancies, conscious and unconscious, that, to one degree or another, a person at a given time rejects as false. (p. 33)

Rokeach posits that a belief-disbelief system includes all beliefs and disbeliefs a person may have built up about the physical and social universe in which he lives. One does not compartmentalize belief. "We mean it to represent each man's total framework for understanding his universe as best he can" (p. 35).

Rokeach identifies properties of belief-disbelief systems such as isolation, where an individual harbors logically contradictory beliefs and compartmentalizes them, not perceiving the inconsistency. There is also the tendency to accentuate differences and minimize similarities when two persons find themselves in disagreement. This is no doubt operative in many "science-religion" debates. Humans also, in an attempt to defend their beliefs, use many techniques to ward off contradiction by others and maintain their own system (pp. 36-40).
In order to grasp the complex theoretical issues pertaining to belief-disbelief systems, Rokeach suggests a model: primitive beliefs are in the central region of a circle, surrounded by intermediate beliefs which in turn are surrounded on the outside by peripheral beliefs. "Intermediate and peripheral beliefs emerge from primitive beliefs, as walking and running emerge from crawling" (p. 42). Table 9 summarizes Rokeach's model. Rokeach (1976) makes several assertions of interest:

1. Not all beliefs are of equal importance to the individual.
2. The more central a belief, the more it will resist change.
3. The more central the belief that is changed, the more widespread the repercussions in the rest of the belief system.
4. A belief that concerns the self-concept is more central.
5. Violation of primitive beliefs supported by unanimous consensus may lead to serious disruption of beliefs about self-identity. (pp. 2-4, 7)

Primitive beliefs are formed early in life and are beliefs whose validity is not questioned. They are often unstated and involve physical and social realities of the world in which one lives. They could be defined as "any belief that virtually everyone is believed to have also" (p. 41).

Intermediate region beliefs involve authorities who help fill out one's understanding of the world. Since no one can on his own approach even a partial understanding of his world, he depends on authorities who give information to supplement what is gained alone by himself. Rokeach quotes Trueblood who states, "We must use reason to determine which authority to follow, just as we use
Table 9. Rokeach's Model of Belief-Disbelief Systems.

<table>
<thead>
<tr>
<th>Belief Type</th>
<th>Name</th>
<th>Position on Continuum</th>
<th>Characteristics</th>
<th>Resistant to Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Primitive</td>
<td>Central</td>
<td>100% social consensus; not subject to controversy; taken for granted to be true.</td>
<td>Extremely</td>
</tr>
<tr>
<td>B</td>
<td>Primitive</td>
<td>Outer region of central</td>
<td>Arise from deep personal experience; derived from self; self conceptions. These are the beliefs such as phobias psychotherapists try to change.</td>
<td>Very</td>
</tr>
<tr>
<td>C</td>
<td>Authority</td>
<td>Intermediate</td>
<td>Beliefs we have about which authorities to trust. We can’t ascertain all truth and must trust others’ word. &quot;Is there a God?&quot; and &quot;What about evolution?&quot; are found here. Alternative interpretations, socially controversial topics; beliefs derived from others.</td>
<td>Somewhat</td>
</tr>
<tr>
<td>D</td>
<td>Authority</td>
<td>Outer region of intermediate</td>
<td>Beliefs from authorities with whom we identify, &quot;What about birth control?&quot; and &quot;How many moons on Jupiter?&quot; are found here. Beliefs originate with religious or political institutions.</td>
<td>Change reasonably easy if suggested by authority or if a new authority is chosen</td>
</tr>
<tr>
<td>E</td>
<td>Inconsequential</td>
<td>Peripheral</td>
<td>Belief that one brand of toothpaste is better; that the mountains are more enjoyable than the seashore; matters of taste.</td>
<td>Minimally</td>
</tr>
</tbody>
</table>

Rokeach (1976) pp. 6-12
reason to determine which faith to adopt" (p. 42). In making these choices the person’s understanding of the nature of authority is involved and the way he chooses to employ authority. Variations in the nature of authority can range from rational, tentative reliance on the one hand to arbitrary, absolute reliance on the other (p. 44).

Peripheral beliefs are derived from authority, filling in all the details of a person’s "world map." These beliefs can be derived by the person himself based on beliefs established in the intermediate sphere. "If we know the specific nature of a person’s intermediate beliefs about authority, it should be possible to deduce therefrom the content of many other beliefs, numbering perhaps in the thousands" (p. 47).

Walsh and Charalambides (1990) explain, "Individuals are routinely challenged to see their way through a bewildering flow of information to make complex decisions and solve problems. They meet this challenge by creating belief structures to give form to the information and to facilitate information processing" (p. 517).

Rokeach (1960) assumes that all information impinging upon a person from his environment must be processed or coded in such a way that it is either rejected or fitted into the belief-disbelief system, an operation he calls "processing-coding activity thinking" and it is still unclear how this proceeds (pp. 47-48). He hypothesizes that first the person screens the new information for compatibility with his primitive beliefs. If it passes this test, it may not be compatible with the
intermediate beliefs. "For this reason, people often selectively avoid contact with stimuli, people, events, books, etc. that threaten the validity of their ideology or proselyte for competing ideologies" (p. 48). This narrowing may be achieved by one's authority at the institutional level. For instance, in the church there may be lists of taboos, or of people, books, or other institutions which may be perceived as dangerous. This may also be achieved at the personal level where one avoids people or refrains from activities or events which might threaten the validity of one's belief system. "A person may expose himself only to one point of view ... selectively choose his friends and associates solely or primarily on the basis of compatibility of systems, selectively avoid social contact with those who adhere to different systems, and ostracize renegades" (p. 49).

Not all new information is handled in this manner, however. Much does get through and is assimilated into the belief-disbelief system by altering or rationalizing the new information or by questioning one's authority sources. "The final step is to file this information, which now may or may not be new, into whatever world outlook one has come to call his own (peripheral belief region)" (p. 49). It becomes part of his belief or disbelief system.

The extent to which new information is assimilated into the belief-disbelief system depends upon the degree to which the system is closed or open. At the closed extreme, it is the new information that must be tampered with—by narrowing it out, altering it, or containing it within isolated bounds. In this way, the belief-disbelief system is left intact. At the open extreme, it is the other way around. New information is assimilated as is and, in the hard process of
reconciling it with other beliefs, communicates with other peripheral, as well as intermediate beliefs, thereby producing "genuine"... changes in the whole belief-disbelief system. (p. 50)

The more open one's system, the more evaluation proceeds on its own merits, the more the person is governed by self-actualizing forces and the less by irrational or external authority forces. In the more closed system, the more difficult it is to distinguish between the world and what is said about the world.

According to Osgood and Tannenbaum (1955), "Extreme judgments are characteristic of less intelligent, less mature, less well educated, or more emotionally oriented individuals" (p. 43). Extreme "all or nothing" judgments are simpler than finely discriminated judgments and this exerts a pressure to polarization toward either entirely good or entirely bad allocations (p. 43). This would be characteristic of a closed system where less rational thinking is employed. The mindlessness suggested by Palmerino et al. (1984) would be operative.

Belief Change

Background. The word "change" produces emotional responses. It is not a neutral word. It threatens. Hoffer (1963) states, "It is my impression that no one really likes the new. We are afraid of it. Even in slight things the experience of the new is rarely without some stirring of foreboding" (1963, p. 1). Watson (1972) has studied the phenomenon of resistance to change and notes that forces in personality or social systems are designed to maintain equilibrium and stability, and resistance comes when change presents itself even though, on the other hand,
humans do not tolerate an environment which is totally free from external stimuli (p. 612).

Considerable research in social psychology has centered on attitude change, the results of which, according to some, could be paralleled with belief change. Practically, the advertising industry desires this data as well as educators, policy makers, negotiators, public relations agencies, psychotherapists, missionaries, politicians, lobbyists, and others who wish to understand how such change occurs and there is extensive literature available which pertains to belief and/or attitude change.

In 1964 Festinger bemoaned the lack of research relating attitude change to behavior (p. 405). In 1974 Mahoney stated that "our current knowledge about beliefs and attitudes is predominantly limited to verbal behavior. Subjects are seldom asked to 'act' on their opinions and the physiological correlates of belief change are virtually unexamined" (p. 230). In 1990, Walsh and Charalambides' assessment is not that different: "We know very little . . . about how belief structures themselves develop and change" (p. 519). Palmerino et al. (1984) quote Eagly and Himmelfarb, "After several decades of research, there are few simple and direct empirical generalizations that can be made concerning how to change attitudes" (p. 188).

Bandura (1972) identifies three variables associated with change: the communicator, the communication, and the recipient. Factors which affect communicator success include expertness, trustworthiness, prestige, impartiality,
social power, and concealment of the persuader’s manipulative or propagandistic intent. Some elements associated with the communication are the order of presenting weak and major arguments, the sequence of supporting and opposing arguments, the degree of explicitness with which conclusions are stated, the amount of repetition, the degree of discrepancy between the views held by the recipient and the ones advocated, and the affective properties of the contents. Variables associated with the recipients include their personality characteristics, level of intelligence, the nature of their pre-existing attitudes, and the strength of their commitment to the original position (p. 51).

Rhine and Severance (1970) express slightly different variables which influence attitude change: (1) the credibility of the source of a persuasive communication, (2) the role of ego-involvement in attitude change, and (3) the discrepancy between a persuasive message and the attitude of persons upon whom the influence is being exerted (p. 175).

Insko (1967) lists three factors associated with the acquisition of new beliefs/attitudes: (1) attention: the communication must interest the recipient, (2) comprehension: the recipient must understand the communication, (3) acceptance: effective persuasion results in change (p. 13).

Watson’s (1972) models which explain schema or belief change include a gradual model where adjustments are made each time an incongruent instance is encountered, and a sudden "all or none" model where major shifts can occur quite quickly. Religious conversions and scientific revolutions would fit the "all or none"
category. This model of tossing out the old schema is only used when there is a new one available to replace it. The third type is adding subcategories to deal with the new information but keeping the original, more general, categories (pp. 208-209).

Weber and Crocker (1983) suggest similar models pertaining to stereotypic change, referring to the first as a bookkeeping model with incremental change. The second is the conversion model with dramatic change, and the accommodation of instances not easily assimilated by existing stereotypes into subtypes is the subtyping model (pp. 962-963).

Hovland and his colleagues were pioneers in the 1950s in attitude change research. Since that time many theories have been promulgated to explain the phenomena associated with attitude and belief change. Insko (1967) outlines each in some depth.

Experimental Findings. In addition to the many theories proposed, many problem specific experiments have been documented which shed light on this subject. For instance, Insko, Turnbull, and Yandell (1974) studied the influence of distraction on attitude change and found three effects: increased attitude change, decreased counterarguments, and increased communication-favorable thoughts (p. 520). The attractiveness or unattractiveness of the communicator and whether the communicator overtly states a desire to influence has been researched by Mills and Aronson (1965, pp. 173-177). They found generally that when the communicator is very attractive and openly states his or her desire to influence the beliefs of an
audience it will increase the effectiveness of the communication. Reynolds and Burgoon (1983) found that those who hold extreme attitudes take longer to change their attitude after receiving a persuasive message than do persons with more moderate attitudes (p. 95).

Walsh and Charalambides (1990) found that "an individual’s belief structure will change after exposure to others’ differing belief structures, if the individual is high in public self-consciousness" (p. 527). Because individuals high in public self-consciousness want their interpersonal relations to go smoothly they tend to accommodate their beliefs to others with whom they disagree.

Morley and Walker (1989) studied the influence of importance, novelty, and plausibility on belief change and concluded that all three were necessary for a belief to be modified (p. 439). Vinokur and Burnstein (1978) observe that persuasiveness of a valid argument is directly related to its novelty (p. 346). Festinger (1964), who researched the relationship between opinion change and behavior change, contends that "in order to produce a stable behavior change following opinion change, an environmental change must also be produced which, representing reality, will support the new opinion and the new behavior" (p. 416).

There is a difference of opinion whether a persuader helps or hinders audience belief change by stating conclusions. Some feel more change occurs if the persuader leads up to a desired change but lets the audience take the last step themselves, since people don’t like to be told what to think. However, even intelligent audiences fail to see the implications behind facts when the implications
are left unsaid and then no desired change would occur (Hovland, Janis, & Kelly, 1953).

Karlins and Abelson (1970) found that presenting more than one side of an argument enhances belief change. Doing so implies objectivity on the part of the communicator and it treats the audience as mature, informed individuals. Also, it enables the communicator to anticipate counter-arguments which the audience may be planning to present (p. 25).

Interestingly, research has also revealed that information hardly ever changes attitudes. New information can strengthen already formed opinion but it rarely brings reversal of opinion (pp. 33-34). Karlins and Abelson quote an anonymous American writer who summed up this phenomenon with these lines:

   The creature man is best persuaded
   When heart, not mind, is inundated;
   Affect is what drives the will;
   Rationality keeps it still. (p. 35)

Actually, "sometimes emotional appeals are more effective, sometimes factual ones; it depends on the kind of message and kind of audience" (p. 35).

Cell (1984) declares that "learning is change" (p. 217). Fellenz (1974) found that adult learning experiences were effective provided that there was, among other factors, the absence of threat to the learner. This would suggest that in a learning environment where a whole belief system might be challenged, minimal learning may occur. This may apply when biblical literalists discuss the possibility that Genesis 1-2 may be allegorical. Perhaps too much is at risk and the possibility
of an alternate interpretation cannot be entertained, let alone endorsed, and learning which might lead to change would not occur.

It is also of interest that social psychologists studying opinion and attitude change find women significantly more persuasible than men (Karlıns & Abelson, 1970, p. 89). Differences in abilities, motives, intellectual capability, and needs also affect belief change. Hovland et al. (1953) note that individual personality factors for both males and females influence attitude change (p. 14).

The credibility of the communicator on opinion change was examined by Aronson, Turner, and Carlsmith (1963) who found that a highly credible communicator could elicit greater opinion change even though his or her opinion was quite discrepant from those of the subjects (pp. 31-36).

McCroskey (1969) found, among other things, that if presented with good evidence, an audience would not be changed if it was familiar with the evidence prior to their exposure to the message and that good evidence was also not effective if it was poorly delivered (p. 175). Wright (1966) found that an influence attempt delivered in an indirect, non-purposive way is apt to be more effective than one delivered directly, or in a "tone of positiveness and arrogance." He advises that an influence attempt from a liked person will be more effective than one from a disliked person (pp. 209-210).

Osgood and Tannenbaum (1955) state:

Each individual has potential attitudes toward a near infinity of objects. It is possible to have varying attitudes toward diverse concepts without any felt incongruity or any pressure toward attitude
change, as long as no association among these objects of judgment is made. As anthropologists well know, members of a culture may entertain logically incompatible attitudes toward objects in their culture (e.g., ancestor worship and fear of the dead) without any stress, as long as the incompatibles are not brought into association. (p. 43)

Robinson (1979) suggests a model which outlines the steps in the change process. It is shown in Table 10.

Table 10. Robinson’s Model of the Steps of Change.

<table>
<thead>
<tr>
<th>Step</th>
<th>Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awareness of need or problem</td>
<td>The individual becomes cognizant of a need for a new way of thinking, feeling, acting.</td>
</tr>
<tr>
<td>Active interest, information gathering, self-inquiry</td>
<td>The individual inquires about and obtains information which will help clarify the new way.</td>
</tr>
<tr>
<td>Mental trial and intellectual insight</td>
<td>The individual practices new behavior, considering advantages and disadvantages, consequences.</td>
</tr>
<tr>
<td>Trial, practice of new behavior and emotional insight</td>
<td>The individual decides to practice new behavior in a &quot;real&quot; situation. With continued practice intellectual insight eventually is followed by emotional insight and right feels right.</td>
</tr>
<tr>
<td>New learned behavior</td>
<td>With emotional insight and consistent practice, the new behavior becomes &quot;learned&quot;--now more or less a permanent part of the individual’s thinking, acting, feeling.</td>
</tr>
</tbody>
</table>

Robinson (1979) p. 6
Resistance to Change. Many authors speak of the resistance and stress of belief change. Hullfish and Smith (1961) confess, "As we sadly know, we are all reluctant to re-examine that which we already know" (p. 53). Lawson and Worsnop (1992) list numerous studies which support this thesis (p. 164). Watson (1972) states that "all of the forces which contribute to stability in personality or in social systems can be perceived as resisting change" (p. 610). He notes further that those who see a change as beneficial find it hard to understand the lengths to which the opposition will go to squelch that innovation (p. 611).

Mahoney (1974) notes that the data tends to reflect that Homo sapiens is a confirming rather than a disconfirming organism (p. 234). He reports that clinical and institutional records illustrate the tenacity of belief, even that which is dysfunctional and when disconfirmatory experience is abundant (p. 241). Mahoney adds that this "revelation" has been around a long time, quoting Francis Bacon:

The human understanding, when any proposition has been once laid down . . . forces everything else to add fresh support and confirmation; and although most cogent and abundant instances may exist to the contrary, yet either does not observe, or despises them, or it gets rid of and rejects them by some distinction, with violent and injurious prejudice, rather than sacrifice the authority of its first conclusions. (Novum organum, 1621, p. 46)

Watson (1972) observes that "experiments with materials designed to bring about changes in attitudes revealed that subjects did not hear clearly, nor remember well, communications with which they disagreed" (p. 613). Listeners pay attention to what accords with present views, and misinterpret or forget information which contradicts their beliefs. They successfully resist the impact of
new evidence that varies from present views. "There are relatively few instances in which old prejudices have been changed by better information or persuasive arguments" (p. 613).

It has been observed that some change which occurs is temporary and that a return to former patterns and beliefs is common. When a change does become permanent, the new behavior or belief is defended and in turn resists new ideas or suggestions. As Watson (1972) summarizes, "the familiar is preferred" (p. 612). He suggests that even when individuals are not satisfied with present beliefs or approaches they cling to the old for the anxiety aroused by the prospect of change is more uncomfortable than the undesirable status quo (p. 614).

An example of this "conceptual conservatism" may have been operating when the clerics refused to even look through Galileo's telescope. Nissani (1989) explores the question of why we hold on so tenaciously to manifestly flawed belief systems. He suggests that "the importance of conceptual conservatism has been underestimated in the psychological literature and that the insistence that the phenomenon constitutes one of the major impediments to progress in the history of ideas could very well be correct" (p. 23).

Ruggiero (1975) explains why there is universal resistance to change. It breaks a routine, threatens established habits, challenges the familiar and requires thinking, examining, and deciding, and most people find it easier to just think and act in the old, comfortable ways (p. 59). When Galileo suggested that the Earth was not the center of the solar system, people were upset and incredulous as it
threatened their belief system. It was a new idea and the apparent facts of sunrises and sunsets seemed to contradict it. Many, many examples can be given to demonstrate the resistance to Darwin's evolutionary contentions.

Ruggiero further suggests that people are unwilling to embrace new ideas because it threatens their sense of security and to many it is a fragile security. Another reason is the fear of the unknown--what will happen if...? Both of these factors can be seen with Christians who are told that Genesis 1 is not a literal record of creation.

The beliefs that Adam and Eve were actual people and that the earth was only 5,000 years old were time-honored. Any suggestion that the book of Genesis might be interpreted symbolically rather than literally seemed to challenge nothing less than the Christian perspective on life. (p. 62)

Doob (1940) researched how the extent to which the certainty and importance an individual ascribes to an attitude will affect the stability of the attitude. He found tentatively that those who revealed no attitude change tended to be more certain and tended to consider their attitudes as more important (p. 562).

Wyer (1974) reports on research which suggests that one's awareness that a belief is vulnerable to attack is sufficient to lead him to bolster his defenses against attacks on this belief and thus to reduce the effectiveness of such attacks. A corollary of this hypothesis is that simply warning a subject that his belief is likely to be attacked will decrease the effectiveness of the attack once it is presented. (p. 209)

By reading or listening to what accords with their present views; by misunderstanding communications which, if correctly received,
would not be consonant with pre-established attitudes; and by conveniently forgetting any learning which would lead to uncongenial conclusions, subjects successfully resist the possible impact of new evidence upon their earlier views. There are relatively few instances in which old prejudices have been changed by better information or persuasive arguments. (p. 613).

Kotter and Schlesinger (1979) maintain that even changes that would appear to be positive and rational involve loss and uncertainty and that individuals or groups can react very differently to change, some passively resisting it, some aggressively attempting to undermine it, and some sincerely embracing it (p. 107). Lyell, a geologist contemporary with Darwin, was forced, upon seeing the data, to change his views on species. He hesitated for almost a decade before making the plunge (Hofstadter, 1957, p. 5) and then stated to a friend, "You may well believe that it cost me a struggle to renounce my old creed" (Clark, 1984, p. 127).

Walsh and Charalambides (1984) claim that if belief structures changed in response to every new piece of information or social encounter, one’s equilibrium would be lost. They suggest that perhaps simple exposure to differing belief structures is not sufficient to elicit change but that a readiness to respond is also a criterion for change (p. 519). Mahoney (1974) observes that "individuals not only selectively attend to belief-confirming experience, but they appear to actively place themselves in environments which enhance the likelihood of such feedback ... Experiences which contradict our assumptive world are selectively ignored or distorted" (p. 234).
Lord, Ross, and Lepper (1979) assert that once formed,

Impressions can survive the total discrediting of the evidence that first gave rise to such beliefs ... Studies demonstrate that beliefs can survive the complete subtraction of the critical formative evidence on which they were initially based ... Strongly entrenched beliefs can also survive the addition of nonsupportive evidence. (p. 2108)

This phenomenon of clinging to initial beliefs to a degree that is inappropriate is called belief perseverance and sheds some light on resistance to change. Anderson (1983) notes that such perseverance occurs even when the initial theory is based on pallid and abstract data, and that the perseverance bias is more pervasive when based on the type of data that is most likely to be challenged and discredited—weak but vivid data (p. 106).

Crocker et al. (1984) discuss schemas, abstract or generic knowledge structures which are stored in memory and specify the defining features and relevant attributes of some stimulus domain and the interrelations among those attributes (p. 197). Schemas, they say, can change in two ways: (a) by evolving to fit the variety of information and life experience to which the perceiver is exposed, called assimilation, and (b) by being modified as incongruent information is received, called accommodation. When the perceiver assimilates schema-inconsistent information into the schema, the schema resists change (p. 198).

The processing of incongruent information requires time, effort to organize and interpret, and motivation to change. Incongruent information takes longer to process and if the current processing load is heavy, there is less ability or motivation to process additional information (Crocker et al., 1984, p. 204). Often,
when the information is perceived as being incongruent with the schema, it is
dismissed as "bad data" and will not be incorporated into the schema. Discrepant
information is evaluated more negatively and is judged less than impartial and fair
than the communication that is closer to the receiver's opinion. When stimuli are
extremely discrepant, neither assimilation nor accommodation will occur and the
information is rejected (pp. 206, 212-213).

Watson (1972) lists recommendations which may lessen resistance to
change. Among them are the following, which may particularly apply to belief
change of a religious nature:

(1) The individual feels it comes from himself, not an outsider.

(2) The change affirms values and ideals which have been long held
by the individual.

(3) The change is of interest to the participant.

(4) The individual feels his autonomy and security are not
threatened.

(5) The individual feels acceptance, support, and confidence in his
relations with others. (p. 617)

Scientists are no different from others in having difficulty switching belief
paradigms. Kuhn (1970) records that Copernicanism made few converts for
almost a century after Copernicus' death and Newton's work was not generally
accepted, particularly on the Continent, for more than half a century after his
Principia appeared. Priestly did not accept the oxygen theory, nor did Lord Kelvin
the electromagnetic theory.
The difficulties of conversion have often been noted by scientists themselves. Darwin, in a particularly perceptive passage at the end of his *Origin of Species*, wrote: "Although I am fully convinced of the truth of the views given in this volume . . ., I by no means expect to convince experienced naturalists whose minds are stocked with a multitude of facts all viewed, during a long course of years, from a point of view directly opposite to mine. . . . [B]ut I look with confidence to the future--to young and rising naturalists, who will be able to view both sides of the question with impartiality." (p. 150-51)

Kuhn (1970) records that Max Planck sadly remarked that "a new scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die, and a new generation grows up that is familiar with it" (p. 151). Once again it is noted that critical thinking is not universal nor practiced by any one person or any group exclusively.

McGuire (1969) notes that there is a relationship between a person's attitude toward an object and his information about it, his perception of it, and his behavior regarding it. Attitudes are determined by the needs of the believer and in ways that may have little to do with the object. Hence, "attitude change is achieved not so much by changing the person's information about, perception of, or behavior toward the object but rather by changing the believer's underlying motivational and personality needs" (p. 270). This perhaps is where the need to remain loyal to a group, or the need to resist the pain of change, or the need to avoid the effort associated with the processing of incongruent information will prevent change and these factors are irrelevant to persuasive content.

Within cultures, some activities are fairly easily changed as a result of new technology. However, anthropologists find that the greatest resistance concerns
matters which pertain to the sacred. This could be paralleled in Western culture where women can become college presidents or chief executive officers of business but find it almost impossible to become a priest, rabbi, bishop, or pope (Watson, 1972, p. 616). Translations of Scripture into new phraseology and terminology have met with disapproval as have some modern hymnody or innovative forms of worship. Traditional practices endure long after they are instructive or relevant. Church leaders often hear the phrase "We have always done it this way." A favorite old hymn expressed it well: "Give me that old time religion. It was good enough for our mothers, and it's good enough for me" (Fuller, Green & MacDougall, 1950, #82). One reason that reconstructing thinking processes can be painful is that structures of thought are not merely of dispassionate cognition. They are also highly personal and emotional, involving cherished values and beliefs (Meyers, 1986, p. 14).

Houf (1935) describes those Christians who incline to hold older belief patterns and resist adapting to the new realities.

Their most natural and easy reaction to the present complicated situation, then, is to stand pat by the older standards of personal behavior and to suspect and reject the newer knowledge. This attitude easily wraps itself in the emotional halo of piety and devotion to the "good old past," its morals and its religion. While this attitude has reasons of its own and is comprehensible, it is not a possible or tenable way for the present generation, whose world is in many ways a new world which simply will not be thus set aside. The attitude here described is the obscurantist reaction, which tends to deny or resist all change and to make of morals and religion static phases of life, a position which more and more brings both morals and religion into disrepute and renders them inadequate to present duties and present needs.
Cowan (1993) refers to a phenomenon Barker calls "paradigm paralysis—a terminal disease of certainty" which describes those who deny an alternative idea because it doesn't fit the established pattern. Those who create new paradigms are usually outsiders, having little to lose. They are called "paradigm pioneers" and must be very courageous (p. 5).

Watson (1992) also notes that most change comes into institutions from outside rather than from inside (p. 616). This could be said for the church as well. The revolutionary changes which occurred with Galileo, Copernicus, and Darwin attest to this. Much which challenges the church to change today comes from without such as current controversies on genetic engineering, abortion, homosexuality, physician assisted suicide, women's rights, and environmental issues.

It is of interest to note that Christ's teachings and life point the way to those who wish to grow and change. The unremitting emphasis of the Gospels is to change, and many of the parables are given to help guide this change (Mann, 1965, p. 157). The term "repent" means "to turn around," to go in another direction. The Apostle Paul repeatedly enjoins the readers of his letters to make changes in their attitudes, behavior, priorities, and lifestyles.

Cell (1984) suggests that individuals have powerful motivations to shield their beliefs from change, an example being the desire to leave one's sense of identity undisturbed. Any belief that is important to one's sense of who one is is difficult to challenge. Religious beliefs would be of this type, for in a sense, the
person is these beliefs. They become embodied in who the person is and in his or her behavior. Individuals may even cling to beliefs that cause them pain if the beliefs are important to their sense of self (p. 76).

Closely related to, and indeed overlapping, beliefs involving our sense of identity and self-esteem are those we hold largely because we think they gain us approval from others, or at least did so in the past. To consider altering or surrendering them seems to us to risk being rejected. We believe others will accept us only if we believe certain things and behave in certain ways. We become so oriented to their approval that we may not even be conscious of this pressure to share their beliefs. Nor do we realize that these beliefs are theirs rather than beliefs that have grown out of our own experience and judgment. (p. 77)

Hovland et al. (1953) also studied the permanency of attitude change. They suggest that factors which influence retention are the nature of the material (the degree of meaning it has for the listener, its emotional tone), the degree to which the material was initially understood, the type of retention required (perhaps the conclusions are remembered better than the specific arguments), and predispositions of the audience. In the latter case, the motivation, degree of interest, gender, and initial attitudinal frame impact retention (pp. 246-251).

Hovland and his colleagues (1953) comment on the relationship between conflict and opinion change. "There have been observations of vacillation, apathy, and loss of interest in conflict-laden issues, of attempts to avoid conflictful communications, to attribute them to spurious sources, and to distort their meaning" (p. 283). All of these responses are defenses against the inconsistencies which become apparent and which result in discomfort. Conflict can definitely be
seen in Christians who seek to understand evolutionary theory yet believe the Genesis accounts to be factual.

Cognitive dissonance is an attitude change theory which addresses this phenomenon. It is based on the principle that an individual finds it uncomfortable to hold inconsistent attitudes and alters them so that they become consonant with each other (Mann, 1985, p. 221).

Rokeach (1976) discusses attitude change in structure rather than in content. Content attitudes are being either "for" or "against" an object or situation. Structural changes imply changes in degree of differentiation, integration, and breadth of an attitude without changing the strength of one's positive or negative feelings toward the object or attitude. For example, "when a person changes from a literal to a figurative interpretation of the Bible a structural rather than a substantive change is implied--that is, he may not have changed in his positive feelings about the sacredness of the Bible" (p. 135).

Lack of critical ability is also seen as a factor in attitude modification. "Persons who are relatively low in ability to engage in critical thinking, to discern fallacious arguments, and to discount propagandistic devices would tend to be highly gullible, readily accepting conclusions that others with a higher level of critical ability would tend to reject" (p. 289). This is borne out in the present research where individuals of lower educational levels tend to be influenced more readily.
Cell (1984) expresses how critical thinking plays a role in belief change:

We need to use present experience to test our beliefs, correcting the misinterpretations we've made, lifting the veils we've placed between ourselves and reality. We also need to see and hear and feel where we've been blind and deaf and unfeeling. Yet we often manipulate our experience to fit our beliefs. We see and hear and feel selectively, tending to experience what we expect to experience, wish to experience, or fear to experience. In this way, we may simply impose our maps upon our present perceptions, endlessly renewing the mistakes, the distortions, the partialities of our past learnings. If we are not to bind ourselves to portions of our past, we need to break these cycles of reindoctrination, using our experience to test what we have learned rather than merely to embody it. (p. 77)

**Group Influence.** The research pertaining to the influence of the group on belief/attitude change is of particular interest in this project because most Christians are part of a larger group, primarily the local congregation, and in those who are denominationally affiliated, the denomination as a whole. Their beliefs usually are formed and sustained within the group. Kennedy (1991) asserts that each person is part of a matrix of personal and group self-identity and self-interest and the ideology of this matrix influences the way that individual perceives the world and imparts all his social relationships (p. 99).

Cell (1984) states:

The voice of conscience, for example, may seem to be our own when often it is really the voice of a parent or other authority in our past... Even to question the values and beliefs they instilled may carry a sense of being rebellious and stir deep-seated feelings of guilt. (p. 77)
Many other researchers have studied the influence of the group on belief/attitude change and there is little doubt that group norms regulate human behavior to a large degree. There are rewards for conforming to the group standards and punishments for deviating from them (Karlin & Abelson, 1970, pp. 49-50, 53). Alienation is a definite risk taken by those who contradict the group consensus. There are strong pressures over many Christians to conform to set beliefs and rewards for doing so such as inclusion and personal affirmation. Wavering can bring strong group disapproval.

Furthermore, there is an inverse relation between the amount of change individuals experienced in a group and the valuation those individuals had of their group membership (Kelley & Volkhart, 1952, p. 464). It has also been noted that the group exerts its greatest influence when all attitudes are made public, so that each member is aware of how the others feel. Only if the group is aware of each individual's status can it have an opportunity to change that individual (Mann, 1965, p. 99). An example of this may be the fact that the faculty of the Institute for Creation Research is required to sign their commitment to the recent, literal, six-day creation and the inerrant authority of the complete Bible doctrine annually (Morris, 1994, letter). Any changes in belief would come to the group's attention immediately.

Cartwright (1972) states, "The behavior, attitudes, beliefs, and values of the individual are all firmly grounded in the groups to which he belongs" and whether they change or resist change will be substantially influenced by the
nature of these groups (p. 78). He further acknowledges the considerable volume of evidence which speaks to the tremendous pressures which groups exert on members to conform to the group’s norms. "The price of deviation in most groups is rejection or even expulsion" (p. 80). Rokeach (1985) asserts that attitude change can be induced by manipulations of the group context. Such change persists only as long as the group continues; it would dissipate soon after the group supports are removed (p. 155).

Watson (1972), referring to Festinger and Thibaut’s conclusions, states,

When one person deviates noticeably from the group norm, a sequence of events may be expected. The group will direct an increasing amount of communication toward him, trying to alter his attitude. If this fails, one after another will abandon him as hopeless. Communication to him will decrease. He may be ignored or excluded. He no longer belongs. (p. 615)

Among factors Schein, Schneier, and Barker (1961) list which contributed towards a willingness to undergo a belief change by American prisoners being held by Chinese communists were the desire not to appear different and the need to establish communication with cellmates and to relieve pressure from them. They also found that the younger the person the more vulnerable he was to change as he was less politically sophisticated and had less inner directedness (p. 123). The group definitely influenced decisions for belief change.

Ruggiero (1975) writes of the phenomenon called "groupthink" where groups tend to concur in a decision without carefully considering all options or questioning the suggestions which are promulgated by a few. This conformist
mentality only entertains information which supports the position they prefer and little critical analysis is given once the consensus is achieved. Ruggiero suggests that groupthink led American leaders to decide to invade North Korea and Cuba and to escalate the Vietnam war (p. 70). It may be observed in other groups including businesses, educational settings, or churches.

Lindquist (1978) observes that humans are rational, so reason and evidence are essential in bringing about change in belief. They are also social creatures and new attitudes are the result of social interaction whereby individuals who have strong persuasive qualities or groups of importance to that person can influence a person’s belief and the rational soundness of the message may be secondary. There are also psychological barriers where human relations become paramount in facilitating change (p. 12).

Yinger (1980) observes:

As a result of our experience, each of us has implicit theories about the world and the way in which it functions. Implicit theories are the unexamined or unconscious theories that allow us to structure, interpret, and make sense of our world... Together they constitute our belief system and our personal perspective. Implicit theories become the lens and filter for everyday experience, dictating what one sees and how one interprets it. (p. 16)

Some suggest that humans are, above all, political animals, busy protecting and strengthening vested interests, and for change to occur powerful coalitions must be built and authoritative decisions obtained which will be enforced by requiring attitude/belief/behavior change. Recent theorists suggest
all of these assumptions play a part, perhaps in varying degrees, depending on
the issue, the person, and the situation (Lindquist, 1978, p. 12).
CHAPTER 3

METHODOLOGY

General Research Design

Naturalistic Research

The naturalistic or descriptive research design was chosen for this project because explanation, insight, and understanding were sought rather than prediction based on cause and effect or the testing of a hypothesis which characterize the rationalistic approach. In this research mode, discovery, in this case people’s thoughts, feelings and beliefs, rather than verification was sought. Theory was generated rather than tested (Guba, 1978, p. 18). Naturalistic research examines results and causes after events have occurred and it is used exclusively with people. The naturalistic researcher seeks broad descriptions, insight, and a general understanding of complex phenomena and it is important to be as open-minded as possible in this search. The totality cannot be comprehended but the researcher decides which issues to pursue in depth. Measurement is not the goal. It is not uncommon in naturalistic research to uncover phenomena whose existence was not expected.
While open-mindedness is necessary for this research approach, the naturalistic researcher believes that personal values cannot be wholly suppressed and therefore expresses them, all the while depending upon and assuming the readers will judge value issues for themselves. The non-manipulative, non-controlled naturalistic mode was employed to gain an understanding of people in their real-life situation with respect to belief: how they arrived at a belief, what factors influenced that belief, what doubts they may have harbored or conflicts they may have experienced or have overcome.

"Naturalistic inquiry attempts to present 'slice-of-life' episodes documented through natural language and representing as closely as possible how people feel, what they know, how they know it, and what their concerns, beliefs, perceptions, and understandings are" (p. 3). Its objective is to understand meaning. Merriam (1988) includes Patton's description of naturalistic inquiry as:

An effort to understand situations in their uniqueness as part of a particular context and the interactions there. This understanding is an end in itself, so that it is not attempting to predict what may happen in the future necessarily, but to understand the nature of that setting—what it means for participants to be in that setting, what their lives are like, what's going on for them, what their meanings are, what the world looks like in that particular setting—and in the analysis to be able to communicate that faithfully to others who are interested in that setting... The analysis strives for depth of understanding. (pp. 16-17)

The particular research design within the naturalistic paradigm which was used was the descriptive case study. Case studies are particularistic, targeting and examining specific phenomena (Merriam, 1988, p. 9, 11), in this instance the
influence of critical thinking and belief and belief change as they related to creationism and evolution. The research has attempted to shed light on the "how" and "why" questions of belief and belief change. How did people arrive at beliefs and why did they choose to believe them or change them? How did they resolve doubts or conflicts which related to these beliefs?

**Quantitative Data**

Seeking to understand multiple realities, triangulation of data was desired. Therefore, both quantitative and qualitative data were collected. Questionnaires gathered information on age, educational level, gender, type of belief, source of belief, degree of assurance of belief, how deeply the people had thought on the subject of origins, and whether they had undergone a belief change with reference to the subjects of organic evolution and creationism.

**Population**

The participants in this study all resided in the general area of northcentral Montana. It was felt that Christians in this area provided a reasonable sampling as many of them had lived in other parts of the country, and all of them had been influenced by the national media and had access to books, periodicals, radio, TV, and religious leaders from all parts of the nation. The conflicts between creationism and organic evolution have been present and visible in this region as in any other. Nine letters to the editor or guest columns were devoted to creationism
and evolution in the Great Falls Tribune in the ten-week period from 27 September to 5 December 1993.

To achieve diversity and a broad overview of theological persuasion, data were gathered from four groups of Christians. Clergy as well as laity were invited to participate. Some of the participants came from the membership rolls of the First Presbyterian Church in Great Falls, Montana, a member of a mainline denomination. Permission to use the membership rolls for this purpose was granted by the session (elders) of the church. A computer program was designed to identify a random sample of the 750 member congregation, and they were sent a questionnaire (see Appendix I) and explanatory cover letter (see Appendix L) by mail. A self-addressed, stamped envelope was included with the letter to facilitate the return of the questionnaire to the researcher.

Additional participants were drawn from attendees at a creation/evolution seminar organized in October 1993 by the Evangelical Lutheran Church in America and led by a Lutheran pastor who is also a museum paleontology research associate. The researcher was given permission to explain the project to the attendees at the dinner break, and all participants at the seminar were invited to complete a questionnaire during that time (see Appendix J). Because those Christians were attending a creation/evolution seminar, it was assumed that some had struggled with the question of origins and some would have undergone a belief change or were in the midst of a belief change or for good reasons had resisted a belief change. This sample was predominantly Lutheran, another mainline
denomination, and since it was a continuing education opportunity, it had a higher than normal percentage of ordained pastors present.

A third group consisted of students who had taken General Biology, several religion courses, and a paleontology course at the College of Great Falls in Great Falls, Montana. This college is a Catholic, liberal arts institution and this sample included some younger Christians from a variety of church backgrounds, both Catholic and Protestant. The researcher was invited by the professor to visit a paleontology classroom and the research project was explained to the students. Those interested in participating were given a questionnaire (see Appendix I).

The final group of participants was recruited at a two-day creationist seminar which was held in Great Falls, Montana, on September 24-25, 1993. This sample represented a variety of fundamentalist churches, both denominational and independent. Several weeks prior to the seminar permission to administer the questionnaires had been requested of The Institute for Creation Research of El Cajon, California. They agreed to permit questionnaires (see Appendix J) to be given to any of the over 2,000 attendees prior to the Friday evening and Saturday morning sessions only. As many guests as possible in the time allotted were invited to complete a questionnaire. Over 100 of the attendees completed a questionnaire. Children and teenagers were excluded. Since people came from some distance to the seminar, many arrived early and there was ample opportunity to obtain this number of completed questionnaires.
The Institute for Creation Research, which presented the creationist seminar entitled "Back to Genesis," believes God has raised them up "to spearhead Biblical Christianity's defense against the godless dogma of evolutionary humanism" (Brochure: Introducing ICR, undated). Along with holding to all of the basic Protestant Christian beliefs such as the virgin birth, deity and incarnation of Jesus, his substitutionary atonement and bodily resurrection, the doctrines of the trinity, sin and justification by faith, their statement of faith includes the following:

--The Bible is the divinely inspired revelation of the Creator, completely free from error of any sort--scientifically, historically, morally, and theologically.

--Each basic type of plant and animal was specifically created "after its kind" by God. None came from non-living substances, nor did any develop from some other plant or animal.

--The first human beings, Adam and Eve, were specially created by God and all other men and women are their descendants.

--The creation of all things occurred in six literal days.

The brochure (undated) for the "Back to Genesis" seminar claims the seminar is "especially designed to teach people the Biblical importance of the creation message" and "provide overwhelming scientific evidences to defend the fact that the universe, and everything in it was created--it did not evolve!"

The Institute for Creation Research exists because, American society--especially our educational system--is dominated by evolutionary humanism; because the harmful consequences of evolutionary thinking on families and society (abortion, promiscuity, drug abuse, homosexuality, and many others) are evident all around us; and because this rebellion against God and his laws stems from
unbelieving scientists and educators undermining the foundational truth of creation. (Brochure: Introducing ICR, undated)

Two hundred sixty-one questionnaires were completed from the groups here identified. Descriptive data were compiled as to age, gender, educational level, belief status, factors which influenced belief, the presence of doubt concerning their belief, and whether belief change had ever occurred. In addition, participants who expressed in the questionnaire that they had seriously thought about the subject of origins and who had gone through a belief change or were in the midst of a belief change with reference to this subject matter were invited to an interview and many of them were given the Watson-Glaser Critical Thinking Appraisal.

Instrumentation

Descriptive data for the naturalistic component of this study were gathered through two research tools: (1) questionnaires (see Appendices I and J) and (2) systematic, in-depth interviews. Data for the quantitative component were gathered through (1) questionnaires (see Appendices I and J) and (2) the Watson-Glaser Critical Thinking Appraisal instrument.

Questionnaires

All participating individuals were initially given a questionnaire (see Appendices I and J) which identified them as (a) creationist, (b) theistic evolutionist, or (c) those who were in the process of formulating belief, were as yet
undecided, or believed some other paradigm. This latter group was labeled as "other." The questionnaires also supplied information on age, gender, education level, religious affiliation, whether they were clergy or laity, type of education (public or parochial), sources for their belief, and whether they entertained doubt. In addition, those who had undergone a belief change with respect to evolution and creationism or who expressed strong feelings of assurance for their present belief were identified.

**Watson-Glaser Critical Thinking Appraisal**

Forty-two of the participants who were interviewed were given the Watson-Glaser Critical Thinking Appraisal. This tool is composed of 80 questions divided equally into five subtests which are designed to measure the following abilities:

1. **Inference.** To be able to discriminate among degrees of truth or falsity or inferences drawn from given data.

2. **Recognition of Assumptions.** To be able to recognize unstated assumptions or presuppositions in given statements or assertions.

3. **Deduction.** To be able to determine whether certain conclusions necessarily follow from information in given statements or premises.

4. **Interpretation.** To be able to weigh evidence and decide if generalizations or conclusions based on the given data are warranted.

5. **Evaluation of Arguments.** To be able to distinguish between arguments that are strong and relevant and those that are weak or irrelevant to a particular question at issue. (Watson & Glaser, 1980, p. 2)
The exercises in the appraisal include problems, statements, arguments, and interpretations of data similar to those which are encountered in daily living. This tool has been used to predict success in occupations in which analytical thinking plays an important role, to measure gains in critical thinking from instructional programs, and as an aid in the research of critical thinking skills (The Psychological Corporation, 1993, p. 38). The 1980 revision, which was used in this study, was designed for a 40-45 minute secondary school class period.

Part of the original design of this research was to administer the Watson-Glaser Critical Thinking Appraisal to all those who were interviewed, and it was hoped that approximately half of the appraisals would be taken by creationists and half by theistic evolutionists and some "others" also. It would have been of interest if there were any association between belief position on this subject and scores on this critical thinking appraisal.

Helmstadter, as quoted by Buros (1972), states, "When judged against the technical criteria of standardization, reliability, and validity, this critical thinking appraisal seems to be an instrument well worth attempting to use in a wide variety of educational assessment, selection and research situations" (p. 1214). The reliability of the Critical Thinking Appraisal has been confirmed over time with the stability of test scores, correlation between scores on parallel forms, and demonstrated internal consistency. "The actual test items have high face validity in that they draw on classroom and general life situations" (Sternberg, 1985b, p. 56). This tool is a widely used and reputable evaluative device for individuals Grade 9
level and above. Sternberg suggests, however, that "it is not clear whether the test has incremental validity in predicting various kinds of performances beyond that which would be obtained with a student-group intelligence test" (p. 57). Crites, also quoted in Buros (1972), questions the appropriateness of this appraisal at higher educational levels, acknowledging its sufficiency for lower grades (high school and first year of college) (p. 1214).

McPeck (1981) wonders how one could prevent one's personal attitude toward a question on the Watson-Glaser Critical Thinking Appraisal from influencing a conclusion (p. 141). He also notes the high correlation between this tool and IQ and reading ability, and challenges Watson and Glaser to demonstrate that they have indeed a tool for assessing critical thinking and not IQ and reading. This might possibly be the reason why several of the participants in this study requested to be excused from taking the appraisal. They may have had weak reading skills and therefore had trouble understanding what was required. Several comments, in fact, hinted at that explanation. It does not follow that critical thinking and high IQ or reading skills should always correlate. Many people with high IQ or reading skills have not learned to think critically, as critical thinking needs to be taught, consciously learned, and practiced.

The subject matter of this research engenders considerable emotion and passion since it pertains to some fundamental and personal beliefs. Critical thinking tests have not, until recently, been designed to assess affective dimensions. The more recently revised Watson-Glaser Critical Thinking Appraisal is including
an assessment of fair-mindedness, identifying an individual's ability to distinguish reasonable defensibility from personal belief.

It became apparent soon after commencing the research that this appraisal was quite a challenge to many to whom it was administered. Some of the older participants were somewhat overwhelmed, and since it was given voluntarily, several of them requested to be excused after they had begun it. They felt very sorry not being able to complete the test, and one expressed that she had not been a good participant. Some comments made were, "I'm very sorry I can't fill out the test. I don't understand a lot of it," or "I hope you won't mind that I decided it was a bit too much for me," or "I regret that this is so difficult for me to grasp."

Many of those who did take the appraisal expressed how challenging and difficult it was and they hoped they had "passed" or that the researcher would not think they were stupid. One lady stated, "I now have more understanding and sympathy for my daughter's frustration in taking the GRE test. I thought that I was a good critical thinker but now I have my doubts. It seems to me there are various possibilities 'depending on' and I really struggled with it." Another said, "I sure hope I don't mess up your data. I'm sure I flunked this." A teacher stated, "I'm sorry I took so long to complete this." A final comment, "I sure wish I had taken a course in logic!"

As the research continued, and as the appraisals which were taken were scored, it was the opinion of the researcher that this tool was not giving significant
information. After considering the problems encountered, the decision was made to terminate its use.

The data which were gathered from the 42 individuals to whom the appraisal was administered are shown in Table 11.

Table 11. Watson-Glaser Critical Thinking Appraisal Data.

<table>
<thead>
<tr>
<th>Number</th>
<th>Average Score</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creationists</td>
<td>17*</td>
<td>64</td>
</tr>
<tr>
<td>Theistic Evolutionists</td>
<td>20</td>
<td>65</td>
</tr>
<tr>
<td>Other</td>
<td>5</td>
<td>62</td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
<td></td>
</tr>
</tbody>
</table>

*Six additional individuals of creationist persuasion asked to be excused from taking this appraisal.

The six participants who requested they be excused from taking the appraisal all stated, in one way or another, that it was too difficult to understand. Their scores, if they had tried to complete the appraisal, may have influenced the creationist average.

A perfect score on this instrument is 80. It can be seen that there is little variation between average scores of the three groups. Watson and Glaser (1980) report that scores from 61-64 are considered the 90th percentile among seniors in high school (p. 4) or between the 55th-70th percentile of upper division students in a four-year college (p. 5). These scores represent the 50th-70th percentile of a national sample of sales representatives from a large business machine company.
(p. 7) or 20th-30th percentile of third year medical school students at a university in the west (p. 6). Scores between 65-71 fall in the 95th-99th percentile of seniors in high school, and those from 46-49 are in the 45th-55th percentile range of high school seniors (p. 4).

Some participants who took the appraisal enjoyed the challenge and a few asked to be given their results. All of those individuals did well, and it was an affirming experience for them.

The average time for the administered appraisals was 54 minutes, the least amount being 39 minutes and the greatest 64 minutes. This is considerably more than the 40-45 minutes the designers suggest is needed for high school students. While 40-45 minutes may be adequate for secondary school students, it was found in this study that adults went more slowly, lingered over each question, perhaps being more motivated, apprehensive, confused, or concerned to do well.

It was also found that some adults received relatively high scores on the Watson-Glaser Appraisal but, when interviewed, did not apply critical thinking skills in the area of creationism, evolutionism belief, or biblical interpretation. It appeared that crossover of critical thinking skills did not occur.

Paul (1993) suggests that the relative recentness of the bulk of scholarship in critical thinking makes it unlikely that any of the several established assessments for critical thinking will suffice, including, of course, the Watson-Glaser Critical Thinking Appraisal (p. 133). The limitations of that tool with adults as seen in this
study attests to the need for an alternate instrument designed specifically for adults.

Interviews

Participants who completed a questionnaire were invited to provide their names and addresses if they were willing to be subsequently interviewed. Of those, the ones who had indicated in their questionnaires that they had thought a lot about origins and had undergone a belief change or expressed strong feelings of assurance on the subject were contacted and invited to an interview. Of the 70 individuals interviewed, 42 were also given the Watson-Glaser Critical Thinking Appraisal.

Samples of interview questions are included in Appendix K. The interviews took place primarily in the homes of the interviewees. The researcher travelled to Augusta, Choteau, Ulm, Vaughn, and Sun River as well as throughout the city of Great Falls and its environs. Several interviews were in restaurants, and other sites included a park (where three participants even prepared a gourmet luncheon), a church, an office, a college lounge, a dining room at a country club, a business board room, and several interviews were conducted by telephone to those who were at some distance.

Members from all groups were most gracious in granting interviews. Many expressed that the experience was enjoyable, stimulating, and enlightening. On several occasions when the setting was in private homes other family members
joined in the discussions which followed the interviews. Some visits were up to three hours long! Without doubt the subjects of creation and evolution are of great interest to Christians. Only two persons who had originally indicated a willingness to be interviewed refused when called and that was because both were particularly overextended at that time.
CHAPTER 4

RESEARCH FINDINGS

To find the influence of critical thinking on Christians' beliefs and belief change with respect to creationism and organic evolution, data were gathered from four sources: (1) students in a paleontology class at the College of Great Falls, a four year, Catholic liberal arts institution, (2) a seminar on creationism/evolution from the theistic evolutionist perspective at an Evangelical Lutheran Church of America church, (3) a computer program was designed to achieve a random sample of the 750 member congregation of a Presbyterian (USA) church, and (4) participants at a creationist seminar given in a large civic center. All of these sources were in northcentral Montana and included a variety of Christians, ranging along a spectrum from fundamentalist to liberal mainline Protestant, as well as Catholic representatives. A mixture of ages and educational levels was included. Members of both sexes and ordained clergy as well as lay people participated. Two hundred sixty-one people completed a questionnaire (Appendices I and J), and of that group 70 were interviewed. Forty-two of those interviewed were given the Watson-Glaser Critical Thinking Appraisal.

The participants who completed questionnaires were invited to voluntarily give their name, address, and telephone number if they were willing to be
interviewed at a later date; 81% of the questionnaires contained those data. Those who had indicated that they (1) had thought a lot on the subject and (2) had undergone a belief change were of particular interest, and all in that category who gave their names were contacted. Fifty-eight individuals accepted the invitation to be interviewed, and an additional 12 interviews were conducted with others who had stated particular comments which the interviewer wished to pursue. Only two individuals who had originally indicated a willingness to be interviewed and who fell into the category of interest declined the interview, both because of other commitments at the time they were contacted.

Of those interviewed, 29 (41%) were creationist, 36 (51%) were theistic evolutionist, and 5 (7%) were "other." The "other" category included those who believed life came by chance, those who were undecided, and those with other beliefs, usually slight variations on the creationist or theistic evolutionist positions which they wished to explain. Those who were interviewed willingly shared their faith journeys, most in considerable detail. The participants were gracious, sincere, cooperative, and honest. Many were enthusiastic. The faith they expressed was genuine and interacting with those Christians was an edifying and enriching experience. One participant stated that the interview had "reinstilled a sense of awe for me."

The questionnaires and interviews provided a great deal of information. Demographic data are presented first, followed by the data collected from the questionnaires and interviews.
Demographic Characteristics

The 261 participants came from four populations which included the age and gender distribution seen in Table 12.

Table 12. Population Age and Gender Data.

<table>
<thead>
<tr>
<th></th>
<th>Under 35 Years</th>
<th></th>
<th></th>
<th>Over 50 Years</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>F</td>
<td>M</td>
<td>F</td>
<td>M</td>
<td>F</td>
</tr>
<tr>
<td>College of Great Falls</td>
<td>5</td>
<td>8</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Lutheran Seminar</td>
<td>2</td>
<td>3</td>
<td>6</td>
<td>9</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Presbyterians</td>
<td>5</td>
<td>5</td>
<td>13</td>
<td>16</td>
<td>27</td>
<td>41</td>
</tr>
<tr>
<td>Creationist Seminar</td>
<td>10</td>
<td>14</td>
<td>23</td>
<td>35</td>
<td>7</td>
<td>14</td>
</tr>
<tr>
<td>Totals</td>
<td>22</td>
<td>30</td>
<td>42</td>
<td>63</td>
<td>40</td>
<td>64</td>
</tr>
</tbody>
</table>

The four groups provided a cross section of belief variation on the subjects of creationism and theistic evolution. General belief categories among the sample of 261 participants were distributed as seen in Table 13. In the category "other," 11 participants checked they believed life arose and evolved by chance, 15 checked "undecided," and 13 checked "other." Of the 11 who checked "chance," 4 were from the Presbyterian sample and 7 were from the college sample. It is not surprising that 39% of the college students in a paleontology class might choose that position, or that it was chosen by so few in the remaining groups. The 15 "undecided" were distributed throughout the four population groups, and those who checked "other"
Table 13. Belief Position of Total Sample.

<table>
<thead>
<tr>
<th></th>
<th>Percent</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creationist</td>
<td>51</td>
<td>134</td>
</tr>
<tr>
<td>Theistic Evolutionist</td>
<td>34</td>
<td>88</td>
</tr>
<tr>
<td>Other</td>
<td>15</td>
<td>39</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>261</td>
</tr>
</tbody>
</table>

...tended to clarify their positions, which were usually slight modifications of the creationist or theistic evolution view. The percentages in Table 13 can be compared to Sheler's (1991) report of a Gallup poll which found 47% of Americans to be creationist, 40% theistic evolutionist, and 9% evolutionary naturalists who rejected the idea of design (p. 59).

The belief distribution within the four groups is presented in Table 14. Those attending the creationist seminar were overwhelmingly creationist, and the other three groups were predominantly theistic evolutionist. Among the Presbyterians and Lutherans the broad spectrum of belief would be expected. This is indicative of the variation of belief found within the mainline denominations. Environments which tolerate autonomous thinking and affirm the freedom to exercise the conscience before God would predictably produce disparity of belief. The college students, Lutherans, and Presbyterians registered more "other" than the fundamentalists at the creationist seminar.
Table 14. Belief Positions Within the Four Groups by Percent.

<table>
<thead>
<tr>
<th></th>
<th>Creationist</th>
<th>Theistic Evolutionist</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>College of Great Falls</td>
<td>11</td>
<td>50</td>
<td>39</td>
</tr>
<tr>
<td>Lutheran Seminar</td>
<td>12</td>
<td>62</td>
<td>26</td>
</tr>
<tr>
<td>Presbyterians</td>
<td>30</td>
<td>50</td>
<td>20</td>
</tr>
<tr>
<td>Creationist Seminar</td>
<td>91</td>
<td>1</td>
<td>8</td>
</tr>
</tbody>
</table>

It can also be seen that very little proselytizing needed to occur at the creationist seminar. Most of that audience was already creationist and, as the questionnaires indicated, they were there to confirm or gather more information about a belief they had previously established.

Since church affiliation was requested on the questionnaires, it was possible to ascertain how many individuals from non-fundamentalist churches attended the creationist seminar. Twenty-nine of the 103 attendees who completed a questionnaire were from mainline churches: 15 Baptists, 12 Lutherans, and 2 Presbyterians. In addition, 4 Catholics were represented. Of the 70 remaining participants, 6 did not provide their church affiliation, and 64 were from independent churches or more fundamental groups such as the Assembly of God. Many of the 15 Baptists would also be considered fundamentalist and at least 6 of the Lutherans were from the Missouri Synod, a conservative branch of Lutherans.

Table 15 expresses the relationship between belief and doubt and reveals the high percentage of creationists who entertained fewer doubts.
Table 15. Belief Position and Expression of Uncertainty.

<table>
<thead>
<tr>
<th></th>
<th>No Uncertainty</th>
<th>Uncertainty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creationist</td>
<td>82% (110)</td>
<td>18% (24)</td>
</tr>
<tr>
<td>Theistic Evolutionist</td>
<td>46% (41)</td>
<td>54% (47)</td>
</tr>
<tr>
<td>Other</td>
<td>33% (13)</td>
<td>67% (26)</td>
</tr>
</tbody>
</table>

Table 16 shows the distribution of those across the four populations who entertained doubts and those who were without uncertainty on the subjects of creationism and organic evolution. Most with doubt identified themselves as theistic evolutionists or "other." A very high percentage of the creationists indicated no doubt or uncertainty in these areas.

Table 16. Expressions of Uncertainty (Doubt) Within Each Group.

<table>
<thead>
<tr>
<th>Group</th>
<th>No Uncertainty</th>
<th>Uncertainty</th>
</tr>
</thead>
<tbody>
<tr>
<td>College of Great Falls</td>
<td>4 22</td>
<td>14 77</td>
</tr>
<tr>
<td>Lutheran Seminar</td>
<td>12 36</td>
<td>21 64</td>
</tr>
<tr>
<td>Presbyterians</td>
<td>63 59</td>
<td>44 41</td>
</tr>
<tr>
<td>Creationist Seminar</td>
<td>83 81</td>
<td>20 19</td>
</tr>
</tbody>
</table>

Table 17 reveals a relationship between belief and educational level. The higher the level of education the greater was the probability that an individual was a theistic evolutionist. Seven of the 13 individuals under the high school category who identified themselves as "other" were from the college sample.
Table 17. Belief Position and Level of Completed Education.

<table>
<thead>
<tr>
<th></th>
<th>High School</th>
<th>College</th>
<th>Graduate School</th>
<th>Completed Graduate Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creationist (134)</td>
<td>62% (84)</td>
<td>16% (22)</td>
<td>11% (15)</td>
<td>11% (13)</td>
</tr>
<tr>
<td>Theistic Evolutionist (88)</td>
<td>18% (16)</td>
<td>18% (16)</td>
<td>28% (25)</td>
<td>35% (31)</td>
</tr>
<tr>
<td>Other (39)</td>
<td>33% (13)</td>
<td>23% (9)</td>
<td>31% (12)</td>
<td>13% (5)</td>
</tr>
</tbody>
</table>

Figures 1-4 describe the educational levels of the four populations.

Table 18 reveals the relationship between age and belief of the 261 participants.

Table 19 lists the factors which participants reported influenced their belief.

Table 18. Relationship between Age and Belief.

<table>
<thead>
<tr>
<th></th>
<th>Under 35</th>
<th>36 - 50</th>
<th>Over 50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creationist</td>
<td>29</td>
<td>68</td>
<td>37</td>
</tr>
<tr>
<td>Theistic Evolutionist</td>
<td>14</td>
<td>31</td>
<td>43</td>
</tr>
<tr>
<td>Other</td>
<td>9</td>
<td>6</td>
<td>24</td>
</tr>
<tr>
<td>Total</td>
<td>52</td>
<td>105</td>
<td>104</td>
</tr>
</tbody>
</table>

Table 19. Factors Which Influenced Belief in Rank Order.

<table>
<thead>
<tr>
<th>College of Great Falls</th>
<th>Lutheran Seminar</th>
<th>Presbyterian</th>
<th>Creationist Seminar</th>
</tr>
</thead>
<tbody>
<tr>
<td>people</td>
<td>people</td>
<td>church</td>
<td>people</td>
</tr>
<tr>
<td>school</td>
<td>church</td>
<td>school</td>
<td>prayer</td>
</tr>
<tr>
<td>books</td>
<td>school</td>
<td>books</td>
<td>church</td>
</tr>
<tr>
<td>family</td>
<td>books</td>
<td>people</td>
<td>books</td>
</tr>
<tr>
<td>prayer</td>
<td>prayer</td>
<td>family</td>
<td>media</td>
</tr>
</tbody>
</table>
Figure 1. Percent of Each Group Terminating Education at High School.

Figure 2. Percent of Each Group Attending College.
Figure 3. Percent of Each Group Attending but Not Completing Graduate School.

Figure 4. Percent of Each Group Completing a Graduate Degree.
All of the interviewees were asked if they believed similarly to their parents on these subjects. There were no noticeable trends. Many stated that their parents were not even Christians, or that they did not know how their parents felt about this subject. Only 14 of the 70 who were asked this question stated that they believed as did their parents, and exactly half (7) of them were creationist and half (7) were theistic evolutionist. Most by far had arrived at their beliefs outside of their family influence.

Questionnaire and Interview Data

The data gathered from the questionnaires and interviews are presented by the three belief categories, with the findings from the creationists presented first, followed by the theistic evolutionists, and finally those in the "Other" category.

Creationists: Critical Thinking

A major motivation for this research was to find whether Christians of creationist or theistic evolutionist persuasion employ critical thinking skills as a basis for their beliefs or any belief changes they may have experienced in those areas. The following comments give insight into thought processes and the extent to which the qualities of critical thought were practiced by creationists. It is rare to find individuals who critically think on everything and there are many Christians who have chosen to put their thoughts and energies into other areas of inquiry and interest.
Critical thinking skills were noted in some of the comments made when attendees at the creationist seminar were asked what they hoped to gain from the seminar. Several expressed a desire to learn, presumably about the creationist perspective. "I am undereducated and need to study more on this topic" was a typical response. If these individuals practiced critical thinking completely, they would be equally motivated to consider all facets of this complex question. If, on the other hand, they limited their exposure to the creationist viewpoint, they would be revealing a bias and lack of breadth. In the interviews some were asked if they would be willing to learn about other viewpoints on this question and while some expressed curiosity, or were willing, most were reluctant to be exposed to other positions.

A physician attending the creationist seminar who identified himself as creationist stated, "I am here to see what they have to say and whether their claims are reasonable." This statement revealed an open-minded attitude, and a desire to gain information and evaluate arguments from this perspective, all qualities of critical thinking.

Another creationist who demonstrated skill in critical thinking was a scientist who, in his interview, observed:

There aren't many true scientists out there. Science is difficult to define. We all have our biases and assumptions. We are talking about something in the past, and we can't go to a laboratory and show by experiments that evolution has occurred. We have to base it on assumptions and it gets into personal beliefs, the social times, and even the politics. These all intermingle and make it hard. I have found junk in both evolutionist as well as creationist material.
It takes honesty and courage to be objective and admit frailty in one's own domain.

A woman at the creationist seminar who had pondered the dilemma stated, "It just boggles the mind for all of those complicated things to have arrived by chance. The laws of probability just don't support it, so I am forced back to a creationist position." This woman was able to express a reason for her position having given it some consideration. Her comment contrasted with many who were unable to defend their creationist stance.

Another example of a creationist who demonstrated critical thinking was a woman at the Lutheran seminar who stated on her questionnaire, "I believe in creation as stated in the Bible, but it is interesting and I am fascinated to hear the different viewpoints." Open-mindedness is a quality of critical thinkers.

A woman with a college degree in physical therapy who scored a 68 on her Watson-Glaser Critical Thinking Appraisal stated in an interview that she had seriously thought about this question while in a church-related college. However, over the years she was beginning to reconsider her beliefs.

Twenty years ago after seeing the different arguments, I felt more strongly toward the creationist side, but as time goes by, I have to say, I feel more of a theistic evolutionist. I don't think it's that big of an issue anymore compared to what they made me think it was when I was in college. Perhaps he [God] didn't do it exactly the way that the creationists are saying it. I feel like I am in between. I would like to see more harmony within the Christian church on that issue because I think it divides us. I think it is important that we believe that God is the creator and that he is totally sovereign in all of it.

When this woman was pressed as to why she still checked "creationist" on her questionnaire, she explained, "Because evolutionists' basic premise is
completely opposite from mine. They believe there is no Creator and that we all came out of the ooze. There is no way that that could have happened by chance."

While this woman was a college graduate, who had given serious thought to the question, she demonstrated some confusion and inconsistency mainly by not comprehending more completely the theistic evolution position. The assumption that belief in evolution included no Creator was a common misconception among many Christians in the study and was mentioned over and over in the interviews and questionnaires. The position of theistic evolution was not well understood and many creationists were not even aware of it as an option.

While the previous statements give evidence of some critical thinking skills, they were in the minority among creationists. Many individuals who identified themselves as creationist showed a lack of higher order thinking. Some were only looking for information which confirmed their present belief, and some admitted an unwillingness to expose themselves to other points of view. Statements were made which were not substantiated with fact or showed oversimplification, and others revealed a very superficial understanding of the problem. There was prejudging and picking and choosing what data to accept as true based on preconceived belief, as well as rationalization. Many comments were vague and narrow. Examples where critical thinking was not employed among creationists follow.

A man who had scored very high on the Watson-Glaser Appraisal, and who had a graduate degree in science stated,
I always think about that Piltdown man and the huge mistake the scientists made. They say it's just science working through and that they eventually corrected their errors. But it was 40 years, and eminent biologists made statements on it. They were really wrong. The magnitude of this and the length of time makes this really serious. Lucy is the fad right now.

This man took one example, generalized, and judged all the work of scientists. He inferred that the data of Lucy will meet the same fate as the Piltdown hoax. Perhaps this was his means of dealing with what might be threatening information. Intellectual fairness would have required that he consider all the data of evolutionary scientists over the decades and not just select one of the mistakes.

Another man, a high school graduate, stated, "I do not trust statistics because they are man controlled. As long as man is in control we have flaws. When God is in control, that is where the trust comes through." This conclusion was based on a false premise, i.e., all of man's data are flawed and not worthy of consideration. This may be a rationalization for comfortably and entirely ignoring statistics which supported evolution, possibly because they have the potential to challenge a personal and sacred belief.

When asked what she wished to gain from the creationist seminar, one woman stated, "I know very little about the details [of creationism], and I'm interested in specific evidence on creationism so I can direct my children to the truth." This woman's comment suggested that she had already made up her mind as to what "truth" was even though she admitted knowing very little about her
position and was merely interested in information which supported that thesis. Another individual expressed his desire for knowledge [presumably on creation science] because "knowledge is an important tool in this nation's fight against Satan." This suggested that he believed the common assertion by creationists that evolutionary teaching is evil and of Satan. If this man were objective and willing to become informed, he would see inevitably that there is a lot of "knowledge" which supports the evolutionary paradigm which would have to be negated for him to retain his view.

A mother, when asked what she hoped to gain from the seminar, stated, "As a homeschooling parent I am excited to receive information that confirms my beliefs and negates evolution so that I can then pass it on to my children." Twelve of the creationist questionnaires made specific reference to the need to confirm or reinforce present belief and disprove evolution. When this woman was asked if she would be willing to attend a seminar put on by Christians who were evolutionists so that she could learn other viewpoints, she said that she would not be able to arrange for babysitters.

One man stated in his questionnaire that his goal at the seminar was "to get more scientific data to prove creation to the uneducated Darwinists." This defensive comment possibly betrayed his inability to rationally win, so he disparaged.

When asked what she hoped to gain at the creationist seminar a lady answered, "To give assistance in explaining away the big bang to my teenage son."
A creationist attending the Lutheran seminar, which was from the theistic evolutionist perspective, stated her purpose for being there was "to listen and learn, but I won't change the way I think." Another woman stated in an interview, "Evolution is just not a Christian view." When this woman was invited to explain that statement, she answered, "I am just not exactly able to say, but I know that is true." A man candidly admitted, "I am a creationist who doesn't know the details or how they fit." Vague, imprecise, unsubstantiated statements betray lower order thinking. Numerous comments reflected opinions which had already been formed, many with little or no evidence or reason, or minds which were closed. Their established beliefs did not seem to be supported by valid data, such as the woman above who was already sure the big bang theory was falsehood yet was not aware of why, or others who had preformed belief and were, after the fact, looking for justification.

A sweeping generalization expressed by a salesman at the seminar showed a shallow grasp of evolutionary theory. "Evolution is taught in our schools with no foundation base or clear thinking, and I am here to learn a base for creationism."

Many of the creationists who were interviewed were asked if they would be willing to attend a seminar of equal length presented by scientists who were Christians and evolutionists in order to become aware of the supporting evidence for the other paradigm. Several said they would go but would not change their minds. One stated, "I probably would go with the frame of mind that I would not change." Others said they would be willing to listen to what they had to say. Two
expressed a sincere curiosity as to what might be presented. Of the 18 who were asked that question, 10 said they would not be interested to attend at all. Their reluctance to hear both sides of an issue exposed close-mindedness, bias, and possibly fear of what they might learn which would be discordant with established belief.

One gentleman, when asked if he would be willing to attend a seminar put on by evolutionists who were Christians in order to hear their perspective, inquired, "Christians, or born-again Christians?" The interviewer answered, "Born-again Christians." The interviewee asked, "They would present evolution as a fact?" The interviewer's response: "They would present the data of geology, astronomy, and biology, and suggest that God did it but that it took a long time." His answer: "I don't think so." This interchange shows some distrust for Christians who hold different views, and again the unwillingness to become informed about an alternate paradigm. The literature on belief and belief change speaks to the reluctance individuals have in considering opposing viewpoints.

When it was suggested that both sides of the creationism/evolution question were not presented at the creationist seminar, one man answered,

We think we need to know everything. God told us how he created, and it's important but we don't have to question everything. I don't mind it if the seminar didn't give us the whole story and point out the weaknesses of creation science. Why expose our weaknesses? I don't even want to know them.

Hiding from truth is intellectual timidity, the opposite of the intellectual courage which is characteristic of a strong thinker. Critical thinkers consciously
seek to identify and correct weaknesses in their position. Questioning is a mark of an active mind. Not caring to understand a subject more thoroughly could be intellectual laziness also.

One man declared:

I think evolution is a religion. It is an anti-God theory. The Bible was given to tell us everything we need to know. Evolution is a means to explain life without God. The evolutionists use the rocks to date the fossils and the fossils to date the rocks. The humanistic education you receive in the public schools tries to refute the Bible. God had the Bible written and he is wiser than anything else.

This statement made reference to evolutionary naturalism which denies the existence of a designer God, a position distinct from the theory of evolution. Evolutionary theory makes no claims as to whether there is a creator God operating. This man was confused and apparently uninformed about the foundations of evolutionary theory. His comment about the fossils and the rocks is a common statement or cliche among creationists, seen often in their literature and heard at the conference as well. It is catchy and simplistic, and it can be used to conceal ignorance of geology and the complex and varied methods of dating.

Additional statements which gave insight into the thinking of some with the creationist viewpoint were: "I discount archeological finds which suggest that the Hebrews got part of their creation story from the people living around them, but archeology does support other parts of the Bible, such as the finding of the city of Ninevah." This individual chose only to consider data which supported a
preformed belief and rejected what did not fit his schema, demonstrating a blatant bias and a lack of consistency and fairness.

A man who scored 52 on the Watson-Glaser Appraisal was asked in an interview why he believed that the Genesis flood was responsible for all the sedimentation and the mountain formation. He stated, "Because the Bible says so." When pressed that that could not be found literally in the Scriptures, he stated, "Well, it says so by implying it." When further questioned if he rejected the thesis that the sedimentary rocks took longer to form he stated, "Absolutely, because that would make Genesis false." The evolutionists' critique that creationists begin with a premise and only accept data that support that premise appears to have some foundation.

Another interviewee with a Watson-Glaser score of 59 stated, when told that possibly some of the conclusions presented at the creationist seminar were not based on accurate data, "Well, the idea of the six day creation is fact, and the flood, and the literal interpretation of the Bible. If there were any errors at the seminar it was not because their thesis was wrong. It would be because all people sin and sin might have entered into it." This irrelevant and rationalizing explanation is not characteristic of quality thinking.

A delightful young woman who scored 67 on the Watson-Glaser Appraisal and who was quite informed on this issue stated,

Evolution deifies man. I see no evidence of man evolving since Homo sapiens, for we still have allergies and mutations and seem to be going the other way. The fruits of theistic evolution, the JEPD
tradition, is loss of faith in the possibility of knowing truth, all truth becomes relative, and for many this leads them to become spiritually bankrupt.

This woman's thesis that living with fewer absolutes leads to spiritual bankruptcy is contradicted by theistic evolutionists who describe living with possibilities rather than absolutes as liberating and they believe it leads to a more authentic, exciting, and personal faith. The data do show that people who hold to theistic evolution live with more doubt and uncertainty, but that cannot fairly be equaled to spiritual bankruptcy.

A busy young woman who was homeschooling her six children said, as she rocked one to sleep, "Evolutionary theory is based on little bone fragments. I saw them in the National Geographic and that convinced me right there. If that is all you have to base it on, then it doesn't make any sense." This woman formed a conclusion on extremely limited data. She also volunteered that she had recently read a book on the flat Earth hypothesis and tended to agree with it, another example of belief being formed on a weak data base. The concern is for children who were being indoctrinated by a scientifically illiterate parent, but who will eventually be thrust into a complex and scientifically dominated world.

The damage incurred by dogmatic creationist belief was seen in one young woman who witnessed her mother's interview in their home and stated in the discussion afterward,

One of the reasons I didn't go to college and why I don't pursue one of the things I'd like to pursue is because I am not sure how to go about being educated without having to radically change what I
believe. I would like to be a paleontologist. How would I get an education without having to compromise what I believe about creationism in order to get through so that I could have that education?

Critical thinkers have the intellectual courage to go where the data lead; they are liberated in their search and committed to following truth and facing the consequences. This young woman demonstrated the bondage, fear, and control which came from her authoritarian heritage. Her narrow vision has prevented her from exposure to the emancipatory learning which could lead to her personal fulfillment. She was forced to forego her dream rather than take the risk. Theistic evolutionists do not fear that any truth found in God's creation might negate his omnipotence.

One woman explained how her belief change occurred:

I used to think that theistic evolution kind of fit into God's plan. When we became walking Christians, my husband started to do research. We went to a "Back to Genesis" seminar and compared theistic evolution with what the Bible said. We concluded we couldn't believe evolution with what the Bible said.

Research from just one perspective is biased and therefore inconclusive. Furthermore, many people do not recognize when they are being propagandized or indoctrinated and it is imperative that they appraise the information from many perspectives and many authorities.

These comments by individuals of creationist persuasion revealed a variety of thinking levels. While some seemed to be sincerely seeking information, or attested to having done that in the past, they tended to limit where they sought the
information. Others expressed open-mindedness, but most had made up their minds previously, no doubt having been taught at church by authority figures whom they had come to trust, and they were looking for data which affirmed that perspective. There was fear to look beyond or challenge established beliefs. Their beliefs were based on a literal interpretation of the Bible and some were not willing to confront empirical data, no doubt out of concern that they might weaken their belief. These comments also demonstrated that many creationists were not aware of the substantiation for or even the accurate meaning of evolutionary theory.

Creationists exhibited an infectious zeal and enthusiasm for their faith, both at the seminar and in the interviews. They, as a group, were searching, committed, and fervent in faith, all commendable qualities. Their loyalty to the creation science paradigm limited their options, however, stifled questions, and channeled them away from a more liberating theology, autonomous thinking, and objective reflection.

The literature in belief and belief change theory speaks to all of these conditions: resistance to changing present belief, the unwillingness to being exposed to alternative paradigms, and the power of authorities, acculturation, and support group. Furthermore, these qualities are intensified when the belief relates to something as personal as one’s faith.
Creationists: Doubt

Table 15 reveals that an overwhelming majority (82%) of the creationists had no doubts about their beliefs on the subjects of creationism and evolution. Eleven questionnaires even had "Absolutely not" or "NO!" written in the space asking if they entertained any doubts on this subject.

Comments such as, "In my life I have seen so much tangible proof that Bible prophesies, claims, etc. are true that I have no reason to doubt any of those which I have not personally witnessed" were quite common in the questionnaires. Several expressed their complete reliance on the biblical record with statements such as, "The Bible is God's word and very clear and precise and I have no other reason to believe in any other way."

The declaration "The Bible says it, I believe it, and that settles it" was written several times and is obviously a key statement of conviction, almost a cliche, within the fundamentalist community. Other similar comments of total reliance on the truth of the Scriptures are presented in the "Creationist Biblical Interpretation" section of this paper.

After one interview the researcher received a letter in the mail from a man who wrote out of a loving concern. Part of it included,

It seemed to me you gave room for some doubt of the literal Scriptures (not a good thing to do). Ecclesiastes 12 gives a warning not to seek answers beyond those God has given in Holy Scriptures. Since God created, designed, and ordered the universe, science must find its roots in Biblical authority, not vice versa.
This communication suggests strongly that doubt is not encouraged and those who do entertain doubt are given a warning. Fear then becomes a controlling device, preventing questioning. Critical thinking involves a freedom to question and a freedom to doubt. The sage has said, "They who never think, never doubt." Those who are not allowed to think do not doubt either.

When asked if he ever doubted his belief on the subject of creationism, one man said, "I used to, but now I am sure. God said it took six days and I think it took six days. I can see where a flood like that for a year or two could also form all the mountains and rivers." When asked how he would explain that the fossils at many sites are layered consecutively and not jumbled up as they might be if there had been a catastrophic flood, the man replied, "I guess we will find out the answer to that when we go to Heaven." This answer was common. When they did not know, they did not question but rested in faith that the explanation would be given in a later life, and that settled it.

In spite of their need for absolutes a few creationists revealed they were thinking and questioning. One man who scored a 63 on the Watson-Glaser Appraisal said,

I don’t say dogmatically that the six days have to be 24 hours and I don’t say they aren’t. I do wonder about the time--billions and billions of years--and also I really wonder if all animals and birds were vegetarian before the fall of man.

Creation scientists teach there was no death on Earth until Adam and Eve sinned. It therefore follows that all animals were vegetarian before that time. Thinking
people do have trouble grasping this concept for it holds that all the fossils were formed after man was on the Earth and all dinosaurs died after humans appeared.

The questionnaire asked if the participants had any questions about the subjects of creationism and evolution. Seventy-three percent of the creationist questionnaires had "none" or "no" written or had left this question unanswered. The questions which were asked could be divided into two general areas: those addressed to evolution adherents (Questions 1-7) and those which pertained to the creationist position (Questions 8-18). The presence or lack of critical thinking can be detected in most of these questions. While they reveal confusion, superficial understanding, and misinformation, some are sincere inquiries about legitimate concerns which have originated from careful thinking.

Questions addressed to evolutionists:

1. How can Christians compromise their minds and faith by believing in evolution? (This was asked with particular reference to the pastor who led the theistic evolution seminar.)

2. How could anybody believe in the stupidity of the big bang and evolution theories?

3. Isn't it degrading to believe you were once an ape?

4. How do they date the fossils?

5. Where are the missing links?

6. I would like the big bang explained.

7. Why does the Bible make no reference to evolution when God had his son here to point some of it out?
Questions addressed to those of creation science persuasion:

8. Fourteen questionnaires included questions pertaining to dinosaurs. "What caused the dinosaurs' demise, the flood?" one asked, and "What is the biblical basis for the extinction of the dinosaurs?" wrote another.

9. How do we start to attack the base foundation of evolution?

10. Eight questions related to the age of the Earth or timing, such as "How old was the Earth when Adam got here?" or "The six days do puzzle me. God's timing is not our timing."

11. My questions concern interpreting archeological findings.

12. Where did Cain get his wife? (This was asked four times.)

13. I wonder about the need for more evidence for creation science.

14. The different colors of people puzzle me if we all came from Adam and Eve. How do they fit into the hominid story?

15. The drillings in the polar ice cap say that the Earth is very old. I would like that explained.

16. I don't understand where cave man came in and why they aren't mentioned in the Bible.

17. Weren't the fossils put here by God to confuse the fools who believe the evolution myths?

18. For a book as big as the Bible, why wasn't more information given on creation?

Creationists: Belief and Belief Change Basis

A major part of this research endeavor sought to demonstrate whether critical thinking was employed by the three groups when belief change occurred. It can be seen by the comments which follow that a few people employed critical
thinking skills to some extent as they struggled with belief and made changes. However, some change was based on minimal data, and others unknowingly misinterpreted data and based their change on false grounds. Some underwent belief change because they saw new and valid data. The affective domain is seen to have profound influence on decisions of faith. Feelings will always be a very significant part of the basis for religious belief.

Reasons given by creationists as a basis for their belief or for changing from an evolutionary or "other" position to that of the creationist position follow. Several were not completely committed to the creationist position and were reserving judgment as they gained more information. The main factor of influence, listed seven times, for those who did undergo belief change was a conversion experience.

It was evident that many individuals who identified themselves as creationist were open-minded and had room for some reservations. The following comments are examples of this lack of dogmatism.

One woman who owned a gift shop said, "As I have grown and learned more I feel there is information that I will never know as well as things I can never learn. I do not believe evolution can lead to new species but feel there is more to 'creation' than just the biblical record." Another lady expressed some doubt after reading creationist literature:

I believed in evolution as the basis of life, that everything developed over a long period of time. Then I started to read the creationist literature, and there were things that made me stop and think. I
always did wonder how we could have so many species, though, and all those fossils that appear so old.

Yet another young woman who checked "creationist" on her questionnaire stated, "There are some unexplained factors that evolution has answered that would draw me in that direction at times. It is hard to know who or what to believe."

A rancher who was sincerely searching and open to truth stated in an interview at lunch,

I have been studying the scientific and biblical evidence for several years, after a considerable amount of secular education. I could never believe in evolution by chance but have considered theistic evolution as an alternative. However, I have real trouble with not seeing the evidence for theistic evolution. I wonder where I might find it.

It is not always easy for lay people to obtain objective sources for answers to their questions.

These individuals were experiencing the confusion of hearing data coming from all sides from supposedly respected authorities. To whom do they listen? They were caught in the middle and honestly didn’t know. Lay people who are seriously seeking find it most difficult to sort out.

Others who were interviewed became creationists because they claimed that evolutionary data are weak. One man who sold farming equipment stated,

I changed because the missing links were never found and some of what they did find was fraud. I thought the big bang which they taught in high school was a joke. Also, having the biblical theory taught to me well has made me change.

Another man, retired from the police force, stated:
I once believed God created the world through evolution but as more proof is given against it, and my ever increasing faith in God grows, I now believe creation is the only answer. There are no transitions. We reproduce after our own kinds. That is what the Bible says, bones or no bones. They can line up the bones to do whatever they want. If anything in the Bible were false, God would have corrected it.

Substantiating evidence is constantly being published in support of evolutionary theory even as more materials are written against it. It is evident that many people do not read both sides.

Many people became creationist because of the order, complexity, beauty, and design they saw in nature. This is where the anthropic principle is expressed. Assuming God created as recorded literally in Genesis 1, they were drawn to the position of creationism. The next four individuals express how thinking or learning about nature drew them to the position of creationism. A woman who was a bookkeeper stated,

It was not so much changing from a belief in evolution to creation as it was changing from not giving any thought to it at all to realizing there's too much order in the universe for it not to have been created by an orderly mind. A blob of protoplasm sitting on a log gradually developing arms and legs simply doesn't cut it.

An elderly man stated,

It's easy to believe in creation just by spending time in nature. I meet him when I hunt or hike in the mountains and I feel his creative power. When you know the kind of God I know, you can see that he is able to create exactly as described in Genesis.

A dynamic, fundamentalist pastor interviewed on the telephone stated,

I had been an evolutionist, partly to make a radical statement. Then I got interested in chemistry in college, the energy shells of the atom.
There is no randomness there. If it all happened by chance, why, that is absolutely untrue on the atomic level. Atoms do not behave by chance. The professor kept saying you can know what’s going to happen. Everything follows laws. There are no random results. That was contradictory to evolution. There had to be a design.

This man based his creationist belief on reason. However, he defines evolution solely as "evolution without design" which is more correctly called "evolutionary naturalism." He does not entertain the possibility of theistic evolution which incorporates design.

A Presbyterian businessman stated, "I was taught evolution, but as I grew up, I saw the ordered universe and believing that it could just happen through random processes is absolutely preposterous." This man admitted to having uncertainties, however, and stated, "Anyone who has no uncertainties is either lying or a fool."

A woman who had completed a graduate degree in college expressed a common and serious concern of creationists that holding a figurative interpretation in Genesis threatens the verities of the faith declared in other parts of the Bible.

I used to believe evolution and tried to reconcile both explanations by defining the day as a long, long time. But that led to some doubt in other areas of biblical interpretation where I didn’t know which to take literally and which I could stretch figuratively. I have been in some Bible studies lately and have been helped by the books and radio moments from the creationists and that has made me change to creationism. The enemy tries, by appealing to my false pride, to make me feel narrow-minded and uneducated in this position but I try not to let this bother me.
A young businessman expressed the same concern:

As much as we'd like to think we are free thinkers, we're molded by what we were taught when we were young. My father was a conservative minister, and creationism was what he taught. I was always told that evolution was a fallacy. The Bible has to be looked at as totally acceptable or it's a book of myth. I have to take it all literally or it doesn’t stand. That is where my creationist belief comes from.

These two comments illustrate the complexity and confusion associated with biblical interpretation and the acute need for available instruction in this discipline, preferably through the churches.

Several people made a point of the fact that evolution was based on "only a theory." A nurse who had undergone a belief change stated,

The more we discover about the world, the more complex we find it is and there is no possible way it could have happened by chance. I was taught evolution in school, which is only theory. Dinosaurs were the only thing I wondered about and they are mentioned in the Bible and were buried at the same time as other fossils, during Noah's flood. I can see the evidence of Noah's flood here in Montana from the front going up to the Rockies. A man came to our church to explain how the flood could cause all the geological formations. It was like a light went on, for I could see how the three buttes up the line here were formed. All the weight of that water caused volcanic activity and you can see volcanic rocks at the buttes when you go out there and they have beautiful cliffs. And they haven't found the transitional fossils and we look at those Rocky Mountains and wonder how they got there. It talks in the Bible about the continents being together. That was like such a light to me, and things started to make sense. All of that data was pivotal and I realized creation really happened. I wonder now how I could have ever questioned it. I think it's an area where God has to talk to you and you make your peace with it.

This woman mentioned several times about evolution being "only a theory."

When pressed as to what that meant to her, she stated, "They don't have enough
evidence to say it isn't just a theory. And it's been a theory for a long, long time. It's not fact. It hasn't been proven, and God made laws which can be proven. He didn't make theories." She also felt children in our society are brainwashed to believe in evolution because it is the only thing taught in the schools.

This woman's comments expressed how powerful the affective realm is within this study. Thinking is not confined to empiricism and rationality, and that is partly why this subject is so confounding to so many. It is significant to see that an educated woman could so easily embrace information which was so inaccurate apparently because it was what she wanted to hear. This knowledge gave her a sense of relief and peace and the insight was described almost as a religious experience. It is also of interest how easily individuals can be influenced. One man whom she respected as an authority was able to persuade her in one lecture. This woman's experience reveals why this subject is so complex and so emotion-laden and why there is much pessimism associated with its resolution. She also illustrates how someone can be educated, in her case in nursing, and not be acquainted with the science associated with these questions.

The following cases relate other examples of the dominant role emotions play in how individuals arrive at belief on the subject of origins and development.

A woman who lives near Glacier National Park explained:

The creationist theory states that the Earth is not that old. I really can't explain it, but my spirit heard that and I had a sigh of relief. I like the idea that the Earth is young. I don't like old things like old furniture or old clothes. It really bothers me when you think of the stuff that man makes up. We don't give God the credit for being the
miracle worker that he is. It has always bothered me to think that I came from an ape. Knowing that we did not evolve has given me a lot of joy! And I can see that the glaciers at the park were carved by the flood, through force and pressure. It's neat to know how it all occurred. It's really quite simple.

A young man explained how a transcendent revelation influenced his belief:

I, at one point, was a believer in evolution but I got to the point that it could not be reconciled with my faith. You get to the point where you can't explain it. It's the witness within you, I know it without a doubt. I know without a doubt now I wouldn't change my mind back, either. People who are not in the place where I am—who say they are on a journey and are open to God's truth—I believe they will come to the conclusion that you take the Bible literally because you hear God speak to you.

The reason given most often by creationists which impacted their belief change was a conversion experience. "I used to be an evolutionist, but when I became a Christian, I became a creationist" one girl stated, suggesting that it all goes together. Another woman said, "When I became a Christian in college, I came to believe that God created the world and not by evolution." Another such statement was "I was brought up on evolution for 27 years and loved archeology and geology, but since receiving Christ I see things differently." "I became a creationist when I became a Christian. When you blend Christianity with evolution you will lose," said another. There was confusion expressed whereby some individuals believed that one cannot be a Christian and believe in evolution.

Another who exposed a lack of understanding of evolutionary theory as well as science stated that he changed belief because of the "holes in evolutionary
Another stated,

A lot of scientists have changed their minds about evolution and have recanted and I have learned that evolution does not have the solid base I had been told. I researched and found more and more cracks in evolutionary theory. No one was there to report it. They had no witnesses. God was there at creation and he has reported it in Genesis.

The lecturer at the creationist seminar explained that no one was there at the beginning, so therefore no one really knows what happened, but, he assured them, the Bible states that God was there, and he recorded what happened in the Scriptures. It is that simple. The convener suggested that the audience should inquire of evolutionists, "WERE YOU THERE?" Evolutionists could not possibly know what occurred because they were not there. Non-critical thinkers follow that logic if the leader is persuasive and the individuals are not sophisticated in science, especially if they are committed to a biblical literalism and the inerrancy of Scripture. Critical thinkers would not agree with the thesis that circumstantial evidence is not legitimate evidence.

One woman stated, "I don't know all the answers. But I think I would rather be a creationist now and be wrong before God in eternity, than be an evolutionist now and be wrong before God in eternity." A hint of fear is seen in this statement.

A creation scientist related,

I was taught evolution, but the evidence in biology is so overwhelmingly against the theory, and there was no point of considering theistic evolution so I went creationist. In biology we have evidence for creationism hands down. We will soon have it in
geology too. You can’t take statements in the Bible and say they are not literal, for that is a dangerous view and puts one on a slippery slope, the end of which is a loss of faith.

This man, who has published on this subject, testified that he had researched creationism and evolution with an open mind, and has been drawn to creationism mainly because of the lack of data in the fossil record as well as what he has learned about genetics. It is of interest that he stated that there was no point in considering what many Christians consider to be a reasonable third option, theistic evolution. He explained,

You would expect from evolution a frequency of fossilization over the supposedly billions of years. The large gaps, the complexity of the trilobites which have compound eyes is beyond belief, and there doesn’t appear to be any ancestors of those eyes in the record. And the gap between invertebrates and vertebrates is a serious one.

When this gentleman was asked if he ever doubted his stance on this subject, he stated, "Oh, in 20 or 25 years, slightly, maybe one or two times." He was very optimistic that, in time, creation scientists will be able to demonstrate its base scientifically and he expressed frustration that the scientific journals, in which the creationist research should be published, refuse to publish from the creationist perspective. When the interviewer suggested that some creationist research has been proven faulty, he stated, "You are going to find on both sides of this controversy a lot of misunderstanding and a lot of people even in their specialty get things wrong."

A clinic administrator from the creationist seminar group, who scored 69 on the Watson-Glaser Appraisal, stated,
There is a God who has revealed himself in the Bible which is the inerrant, inspired, literally true word of God. The evolutionist doesn’t come from that premise, so if you have the most convincing evidence there is but your premise is wrong, you are wrong. When I became a Christian I could see the difference and am a creationist although I don't know very much biology.

The following individuals also expressed how their spiritual, personal, and emotional lives were intertwined with belief in this subject area. A young woman wrote,

I was taught evolution but as I began attending church, talking with friends, reading the Bible, I had a "feeling" to reject those who could not prove evolution. I began to become a creationist. I could see God's miracles every day all around me, so why question him? When God speaks to you, you'll never believe in evolution.

A young man vehemently wrote, in large black letters, with lots of exclamation points, "Evolution means there is no God! It says we came by death and destruction! There is no combining the evolutionary theory and the Bible! Why explain away the Bible? Why research ways to make me doubt?"

Some succinct statements which give additional information on the factors which influenced creationist belief change follow:

1. Reading books by creation scientists (six stated how important creationist literature was to their change) and reading about the many problems of the theory of evolution.

2. I got stronger in my Christian belief and realized that the word is the word and that's the truth!

3. Creation "moments" on Christian radio convinced me.

4. Good Bible teaching.
The fraud of the fossil record and the missing links never found. 
The stupidity of the big bang theory.

Creationists: Biblical Interpretation

The means by which individuals interpret Scripture profoundly impacts their beliefs on the subject of creationism and evolution, and it was important to discover what position the creationist participants held on this subject. If they held to a literal and inerrant word, they were inescapably creationist. If they were open to a more figurative or symbolic means of interpretation, they would be free to at least entertain the theistic evolutionist position. Creationist belief, therefore, generally was accompanied by a strong affirmation of the literal and inerrant truth of the Scriptures. A representative statement was: "The Bible states the full truth, and I have confidence that it can be depended upon completely." Four individuals wrote, "God said it, I believe it, and that settles it," a statement, almost a cliche, that appears to be common within the fundamental milieu.

Other comments written on questionnaires which revealed a total reliance upon the inerrant Scriptures were: "Evolution is a lie and creation is the truth because God said so." "I know what God says is truth and you don’t worry about understanding." A businessman in town stated, "The two stories in Genesis have to agree because the Bible has no errors whatsoever." A pastor's wife with an advanced degree in business stated, "I take the whole Bible literally. I think it is the inspired word of God, no questions asked. I don’t think there is anything in the Bible that isn’t God’s word. I don’t question it."
All of these comments revealed the conviction that the English Bible contains the words of God, infallible, inerrant, complete. It is truth. There was no allowance for the frailty of human influence. All other data must fit within its truthful, unchanging parameters.

A gracious woman being interviewed in her lovely home explained with considerable insight,

There are verses I take that are promises to me. It certainly wasn’t written for that. It was written for someone in the Old Testament, but if I have a certain need, God can use a verse in Jeremiah. I believe he can use his book to speak to me. That is how I believe he uses the stories in Genesis too. It was written for a more primitive mind, yet it can still apply and have accuracy to me too.

This woman saw the Bible as a living book, yet remembered its original context.

A man from the creationist seminar who received a 65 on the Watson-Glaser Appraisal stated,

I believe the Bible is without error and infallible. It is God’s revelation of himself to us. He is a spirit and no one has seen him so he had to reveal himself. We give him anthropomorphic characteristics so we can understand him. That is why they are used in the Bible. There are a number of occurrences of poetry in the Bible. It is notorious for that language, but it doesn’t negate that somehow God had to reveal himself, first in his creation, and that had to be the straightforward truth because that was the foundation.

When the interviewer asked if the Bible might not have been meant to be a science book but a book of faith and religion, one man, who owned his own insurance business and who had achieved a 68 on the Watson-Glaser Appraisal, said authoritatively, "God knows science and he wrote the science correctly. If you think the science is inaccurate, you are misreading it. You can only look at the
Bible as being all truth." This man was another example of one who had done well on his critical thinking appraisal, was apparently a successful businessman and no doubt a critical thinker in his secular life, but could not entertain the thought that the Bible could err, or that it might be interpreted in a different way, and tenaciously clung to his thesis.

Other individuals expressed more of a struggle with biblical interpretation, such as an insightful young woman who explained:

It depends on how you define literal. Most people, including me, believe there are places where the Bible is poetic or has parables. It has a message. Some places in the Bible I struggle with cultural things such as whether women should have their heads covered in church. We are living in a different society today. I worked on a hotline for domestic violence and found that some men who were strongly religious were justifying their violence from the literal interpretation of the Bible where it says the man is to be the head of the woman. People misinterpret the Bible and it's very scary.

This woman's broad-minded view of scriptural interpretation was the exception for those who identified themselves as creationist.

When an interviewee who claimed to be a strict literalist was asked how he explained the two sequence conflicts of man's and woman's creation in the two Genesis accounts skirted the issue somewhat, explaining:

The Bible was written by humans at some point. Either they had a direct memory of the events or were inspired by God to write as they did. The two kinds of views say the same thing in Genesis. I don't have the perfect answer but I don't believe they are strongly different. It points to a way of saying that humans were distinctly unique.
Many creationists called themselves literalists and clung doggedly to the literal interpretation of Genesis 1 and 2. Yet, as is seen in the previous quotation, they could not explain clearly the contradictions which came when they were asked about poetry, parables, allegories, or the actual differences in sequence of the accounts in Genesis. One woman stated in an interview, "I do take the Bible literally although I know some of it is poetic and some revelation. I don't have an answer for a lot of questions as to which is which. I am not a Hebrew scholar."

Another said, "If you are going to believe any part of the Bible literally you have to believe it all literally. You can't just take parts." When asked if the book of Revelation could be taken literally, this woman said, "It's literally written in hidden form."

Another lady stated in an interview, "You have to look at the Bible through faith and know what God says. We can't have come from an ape because it doesn't say that in the Bible. It is true that woman came from the rib of a man because men have one less rib." This latter comment is sometimes heard in creationist circles but has no foundation in fact.

When a creationist, fundamentalist pastor was questioned as to whether lay people have been appropriately trained to read the Bible, he stated,

No. No, we haven't trained them enough. It's partly because of our own laziness and partly because of the demands in so many other areas such as the counseling, administration, and all those other commitments in the job. These other roles diminish what we should be doing and that is helping people with the word of God.
That same pastor was quite knowledgeable on the subject of evolution and creationism and wished to clarify the difference between macroevolution and microevolution. The latter, he stated, is accepted by most creationists. In addition, when asked about some specific statements in the Bible which would be impossible to take literally, he stated,

> We simply cannot delve into the depths of God's wisdom. I have to accept God in his wisdom and let him be God and accept how he chose to write the Scriptures. I would love to be able to understand everything. The difference boils down, in the way Christians see the Bible today, to whether you believe it is God's word or it is man who is writing a book and God is influencing it. There is a huge difference between those two positions. In the answer to that question you become a literalist or a figurativist.

This man could not rationally defend his position of literalism and was compelled to hide behind human limitations to justify his stand. This weak foundation for the belief that was so essential to his spirituality and occupation seemed not to concern him. Faith assurance covered any doubt.

One man, when asked to explain what he meant by a literal interpretation and how he handled some of the conflicting facts in the Bible, avoided the question and claimed that the Bible had been changed drastically by translators over the years.

> They have left things out, changed things to their way of thinking. It only takes one person who translates in that group to screw it up. If they would just leave it alone the way it originally was and if everyone else would get the kids going back to church where they belong, we wouldn't have these big controversies.
Even though he asserted he was a strong creationist, this man could not defend his literalist position, so he blamed the translators and negligent parents for the problems of interpretation!

A creationist pastor, wisely attempting to put things into proper perspective, stated:

Probably the biggest problem is that people miss the whole point of the Bible when they get wrapped up about these details. The heart of the matter is the salvation of souls and the fact of sin. While I am convinced of the six literal days, I try not to get involved so as to forget the main point and that is Jesus dying on the cross for the salvation of the world. We do need to be involved with these issues as the world will challenge the validity of the Bible, but much of it rests on faith and without faith it will always be hard to totally defend each word.

Another creationist pastor stated,

The theistic evolutionist position is inconsistent in itself. If you believe Romans 5:12 [Therefore, just as sin entered the world through one man, and death through sin, and in this way death came to all men, because all sinned (New International Version, p. 1181)], you can't believe that God created the world by evolution. The Bible says that death came through man's sin, so death did not occur in the Earth until man was here. Evolution could not have happened for it supposedly took millions of years and included much death before man was supposedly on the scene.

When this man was questioned how the food web could exist with all animals being vegetarian and how animals with carnivorous teeth ate plants, he answered, "That is based on the present ground rules that we have. If you take the Bible for being true, then we have to understand that the ground rules were different then." He also added, "The zoo in Berlin fed their lions and tigers on
plants all through World War II." Another creationist responded to that question with, "We cut vegetables with sharp knives, so they could do it."

It seemed that if literalists could not explain their position, they claimed trust and faith or asserted that the laws of nature were different at that time, or they thought up a bizarre explanation which, in their minds, settled the question. When someone claims that the laws of nature were different, logic fails, and the discussion ends. For these reasons many are pessimistic as they speculate on the resolution of this conflict.

**Creationists: Science/Faith Relationship**

Many of those who were interviewed were asked if they thought science helped or hindered faith. While most were noncommittal, having no opinion, the comments by several creationists tended to include a trace of suspicion when they spoke of science and scientists.

A young woman, an elementary school teacher, stated in an interview,

*People think that scientists are totally objective but many of them believe what they believe as though it is a religion. When I teach first grade and talk about the dinosaurs I am careful to say "scientists believe" and not let the children think it is so as a fact.*

A gentleman expressed his distrust for science stating that it hinders faith.

"They say they have a whale that walked which pointed towards evolution. This kind of falsehood doesn’t help young people in their faith. And this dinosaur stuff, it hurts faith."
One retired woman stated,

I think scientists interfere with faith but I don’t think science does. Scientists have made mistakes. How can you know that they aren’t going to be proved wrong later? I don’t pay much attention to some of what they say, especially if it will affect my faith.

**Theistic Evolutionists: Critical Thinking**

Only a few comments by individuals of this persuasion expressed a lack of open-mindedness or willingness to evaluate available data. Most statements reveal intellectual honesty and humility, a lack of dogmatism, belief based on substantiated data, and the desire to reserve judgment. Many admit to being puzzled. Intellectual courage, and a willingness to be proven wrong can be detected in these statements. Autonomous thinking is expressed repeatedly. The majority of the comments show keen insight, and it is obvious that many conclusions have resulted from serious thought on the question. This is in contrast to the majority of the comments by creationists which expressed a serious lack of information on the material and a persistent unwillingness to become more informed about it.

Numerous statements by theistic evolutionists demonstrated their skills with critical thinking and how it could be applied to the spiritual life. One man from the Presbyterian sample, who appeared to be in his sixties and who had a low score on the Watson-Glaser Appraisal, stated,

The older I get the more I realize that there isn’t just one way to look at things. If critical thinking were applied, it would help the fundamentalists and the more liberal Christians have more harmony.
They would all have a bigger basis to decide what to think. That broad thinking gives a varied picture of God and assumes a wider world view. That's where we should be going in our thinking.

A wise comment like this from a man with a lower score on the appraisal brings into question the validity of the appraisal with older adults.

Several theistic evolutionists discussed the pleasure of learning and the Christian education opportunities this subject might provide. A woman from the Lutheran sample who had traveled some distance to attend the seminar volunteered a means by which lay people could become more knowledgeable on this subject: "Lay people should have complete reading lists to be exposed to all sides of this question. They could then figure out some of this on their own." She got quite excited contemplating how church members could become more informed and suggested that churches could have adult reading programs with resources available at regional levels.

Another young woman related her excitement learning within the faith community, exchanging ideas, and she also spoke to the need by some for absolutes. She received a 60 on her Critical Thinking Appraisal yet spoke with keen insight.

Look at the Bible study I went to. Everyone had a different opinion as to what this means. Then you try to put it together and you exchange ideas and it's fun. It's a constant learning. Some people think they have read and studied it and that they know. When someone comes along and says they have easy answers, no questions allowed and you don't have to think anymore, it's very tidy. They ignore a large percentage of life and faith.
Other comments on the rewards of education: "It is through education that you learn to question," one young man said, and "I love the questions. God can't be boxed in." A high school teacher exclaimed, "I enjoy wondering about the sense of it all." These are comments which show intellectual vigor and health.

Many theistic evolutionists conceded that they did not have all of the answers, that the picture was not complete. For instance, a student from the college wrote,

I could not accept the world by chance due to my "logical" view of the situation. As I have grown and learned more I feel there is information that I will never know as well as things I can learn.

This woman was realistic, and appeared comfortable living in a state of ambiguity.

An important aspect relating to beliefs about creationism and organic evolution concerns the authority figures who are chosen. The literature in belief and belief change theory reports that as people mature and grow they change their authority figures, which is not always easy to accomplish. Several of the theistic evolutionists spoke to the need to keep options open and add new authority figures. One young woman stated in an interview, "There is a real danger in always believing what people tell you, be it your mother, father, priest, husband or whoever. Nobody can know everything. I am always looking for experts to help me understand areas which confuse me." She refused "inherited" or chance authorities, even admitting the fallibility of people dear to her. This took courage and presented some risk. She exercised the option of choosing authorities based
on her criteria. Considering expert opinion and evaluating their arguments are important aspects of higher order thinking.

A young man from the college observed, "As a kid you listen to your parents or elders. When you get older you start to think and you listen to new voices and you don't just set yourself within the parameters with which you have been taught." Listening to new voices is how new authorities are chosen.

An active young woman from the Presbyterian sample noted,

We don't live in a society that says, "Think for yourself." Everybody tells us what to believe, how to react, to the point that people don't know what to think. If you get so busy and so tired, you are just glad to be told by someone what to think, especially if it is someone you like and respect. If they give you answers in a forceful, articulate way, you will soon readily believe them. People are not taught to question. When you go to a seminar or Bible conference you just want to have those smart people tell you what to think and it's very tempting to just let things be.

This young woman has understood how much energy and thought is required for critical thinking, and she agrees with so many of the authors on critical thinking that society does not encourage, in fact it discourages, critical thinking, and, as she notes, it is often not easy to exercise within the church either. She also is quite discerning about how cunning leaders can become one's authorities inadvertently.

A young mother also spoke about letting people explore on their own:

If you keep people fearful, you can control them. When people are allowed to be open and question things, they may go off on a strange track but they will come back with another idea that might build on what they had originally thought. You add and it changes your
perspective. But if you are afraid to look at a direction, you are controlled.

A final comment on the subject of choosing new authority figures as one exercises autonomous thinking came from a young man who explained where this kind of freedom led:

As a child, one is for the most part molded by the beliefs of one's parents. When this child breaks away from this continual guidance, it seems oftentimes questions begin concerning what has been taught. This is what happened to me. I questioned the teachings of my parents and my church. I had been taught in my church pretty much what to believe and we were not encouraged to think on our own. In catechism we were told, "This is the way it is and there is no deviation from it." I found myself thinking, as I got older, that that was a domination which was unfair to my own experience as a scientist and to my intelligence. For a long time I didn't go to church for I felt I had been lied to. I didn't want to have anything to do with church. They hadn't given me a chance to try to think for myself. I felt it was my fault for letting it happen, not their fault, though.

Several interviewees, college students from the Catholic tradition, spoke of the positive changes which have occurred in their church in recent decades where autonomous thinking is now encouraged.

If a church doesn't let us further our minds or think for ourselves, I think it is a crime. I am aware of the difference between teaching and guiding and propagandizing. We could have Bibles in our home when I was young but we were not supposed to read them. If we did read them, we were told not to interpret it. I have this Bible here that I have had since I was a child and you can see it has not been used. It was earth shattering for us Catholics to be allowed to read the Bible. That was a very important change the church made for the better.

An older college student related,

I grew up Catholic, and when I was a child, you didn't question. You took it as fact, the truth, and you didn’t dare question it. I was never
encouraged, at church or at home, to question or think on my own. We were not encouraged to read the Bible even. I know the church has changed since then, but when I was growing up everything was decided for you. College taught me that I could think on my own and I loved that. I got so many different angles on so many different subjects, and it has broadened my view. I hope when I get out of school I won’t turn that off.

This woman expressed the liberation of becoming a free thinker. She was a powerful example of how the college environment expanded thinking and permitted minds to flourish if they wished.

A very thoughtful and mature woman who was deeply involved with humanitarian service at the time related,

I look back on a time in my life when I was bound to bed for almost a year. I couldn’t go to church, but I could think on my own a lot. I questioned everything but couldn’t question my religion, and that was giving me trouble because the evolutionary thing was an interest of mine and I thought, "I can’t dispute that." Then I discovered Teilhard de Chardin, a paleontologist and deeply spiritual man, and his writings helped me incorporate all of the elements, and I decided that I didn’t have to throw away everything from my religion just because I saw that part of it was flawed. I have to say the church is a human institution, peopled by fallible human beings and it is inevitable that there will be fallacy in it. But I knew that I needed a spiritual part of my life and was willing to overlook the parts of my church which I felt were not correct and benefit from the rich spiritual resources it provided. I want to keep nurturing the spiritual dimension just as I nurture the intellectual dimension.

Teilhard was committed to both science and the spiritual dimension and he is the hero of my life. He was kept from publishing what he felt during life but he kept going, undaunted, for he knew that the truth would eventually get out after he died. The main thing is that you can be an intellectual with a searching mind and can ask any question in the world and that is not in conflict with the spiritual nature which certainly in the past century was seen as two parallel disciplines that could never meet. I think if I had to choose, to abandon faith to go with reason, I would commit suicide. I have to
have both dimensions in my life and ask that of my spiritual milieu--it must support both parts of my life.

This woman's journey was one of intellectual courage, perseverance, and risk. She was strong in faith but honest in her need for intellectual integrity. She found an authority for whom she had great respect and who could help in her search. Her description of weaving the cognitive, intellectual dimension into the spiritual, emotional dimension shows complex, effort filled thinking, honesty, and determination, all qualities of higher order thinking at its best.

The comments which follow all came from the Presbyterian sample. They give insight into the more varied, free-thinking, less authoritarian milieu of a mainline denomination. These statements demonstrate how individuals confront all sides of an issue, respect others' opinions, and live with uncertainty. A pastor is seen as a professional who does not claim to have all the answers.

One man, a civic leader, when asked if lay people should question those in Christian leadership, stated,

I think we need to challenge our church leaders if we feel they are incorrect. They are only human, too. Perhaps we need to just question to try to understand their point of view. Martin Luther challenged the world's greatest authority at the time. It was very difficult for him and everyone, but the outcome was the Protestant Reformation and that was good for everyone. It made everyone think.

A young father, who shared that he was growing in his faith, said,

I attended a Bible study by our pastor and it was just great. It was never a question of "This is what the Bible says, and this is what life is." He taught it as an open-minded professor would have. The record is here, here is our best guess, here are the time frames, this
is what the scholars say, and here are the problems. Now you have
to make up your mind. I love being given the freedom to struggle
and decide for myself.

Later in the interview he stated,

Some people believe differently than me. Does that mean that I am
wrong and they are right? Sometimes. The first thing that wears out
on my pencil is the eraser. I like to listen to other viewpoints.
Sometimes I even change.

A mother of three little girls stated, "I think evolution and creationism are
such difficult subjects that I am not totally against being open to all viewpoints, but
I can’t fathom that God just created the world in six simple days. He has never
done anything easily."

A grade school teacher, when discussing how other Christians think, stated,

Fervent creationists frighten me. They’re saying God is bound by
the mental outlook men held millennia ago and that he is frozen in
place. They’re so frightened of facts. Their faith is so fragile. How
can they be eased into the present?

A very basic human quality is to resist change. The literature speaks to the
security and comfort of tradition and the known, yet critical thinkers should be
open to new ideas and perspectives. This refreshing newness can be applied within
the church.

An attractive businesswoman and mother of teens, wrote in the
questionnaire,

The basis for my belief is that the Bible contains absolute truth and
the knowledge that man has is such a minute amount that the
science and the Bible only disagree because we are so ignorant
about the facts. I wonder if the Bible contains the whole story or if
we are still being fed as children because we can’t handle meat?
This woman's assertion that the Bible contained absolute truth is not unusual in a mainline church. She represents part of the broad spectrum of Christians found in that milieu.

A Presbyterian elder and businessman stated in an interview,

I would be the first to confess that how you are brought up is what you believe. But that is why I love to go to classes at church and I pick up a book occasionally at the Christian bookstore to help me see other opinions. As I get older I am interested in learning what the scholars say. You don't have to believe everything, and some of what they say even affirms your faith. I am not afraid to hear anything, though. Some are afraid to hear new things. Sometimes I think, "Who do we think we are in such a small time frame, that we think we are all that there is or understand it all?"

This man's comments reveal an open mind, the joy of exploring new ideas, and the courage to look at alternative positions, all critical thinking characteristics. He can humbly put himself into the larger picture.

A special education teacher and elder stated,

When I grew up in the South they taught that there was only one way you could look at the subject of creation. I thought it was terribly pompous of the individuals to say that you can only be taught one way. What on earth did God give us a mind for? It's the only thing that differentiates us from the ape and many of us are afraid to use it.

A tennis playing woman in her fifties with a mind open to new possibilities, stated,

Being raised in the Bible belt, I tended to be a creationist as a youngster. The amount of scientific evidence and the explosion of information support evolution, so I am a theistic evolutionist now. However, who is to say what may be discovered in the future that may influence my thinking? To believe just one way or the other would be shortsighted and would diminish the power of God.
A thoughtful woman in her sixties explained her understanding of how God works:

God's way of working is through a process. A person can be "born again" in an instant, but the process God uses to bring that person to perfection takes a lifetime. A seed grows to a flower. It makes sense he creates this way too.

Finally, a woman with a degree in sociology commented on how she formed and defended her beliefs:

I would have trouble if someone tried to persuade me that Jesus was not God, something basic like that, or that he wasn't my Savior. But these other issues, I am open about them. I am open about the other, too, but I think you just can't reason out whether Jesus was God. You have to accept that on faith and let it be. I can't explain God. I believe what I believe. I don't have the body of Jesus to dig up. Certain things you just have to accept. But when the rational mind brings in information, you can't just ignore it and hide behind faith.

Here again, the boundary of reason was acknowledged and the transcendent intruded. There is only so far a critical thinker can go within the religious sphere, or in many other realms. An honest person admits the limitations of critical thinking as well.

The following comments came from students, from the college sample as well as from the Lutheran and Presbyterian groups, and they delineated the changes which they had undergone as a result of education and an atmosphere of inquiry. These comments are indicative of minds which are open, which have learned to be objective, and which dare to challenge and expose their doubts.

A student who grew up in a fundamentalist background, who said she had read the Bible through four times to her children at bedtime, stated,
I love my pastor and grew up with fundamental preaching, and I understand where they are coming from. I had to go to college and take a paleontology class which explained a lot of things to me. If you haven’t seen that, you won’t believe in evolution. You will believe the literal way. I tell people, “If you had taken the class I took you would believe differently too.”

A student in her late thirties stated,

I just can’t understand people who think they know all of the Bible. There are so many parts which are hard to correlate. Only a narrow-minded person thinks he knows it all. Only God knows everything so I leave myself open. I see more than one side to almost everything in my life. You just can’t rely on faith and say, "To heck with all the evidence, those fossils really don’t exist." There are new discoveries daily. I believe science and the Bible agree, but how? This is being developed as we go. The trick is to seek answers without prejudice.

Another critical thinker asserted, when asked if she felt confident about her present belief, "I am happy for someone to prove me wrong."

"I would like to know, like all mankind, the absolute, complete account of how our universe, solar system, planet and my own existence came to be and where it is going. I am open to answers, and hopefully without prejudice," a woman stated over coffee in the student lounge. Another student said,

People say they want their churches to help them interpret the Bible, but once it starts, it can get scary. Then they don’t want it anymore. People don’t want to be told they were wrong and to lose their absolutes. They aren’t open to change for it’s an unknown.

A young man from an Episcopalian upbringing described an environment in which critical thinking could flourish:

My parents have allowed me to free think. You read, your peers, and your parents all influence. You look. I have always asked questions and have been encouraged to do so. I am still searching
and open. I may never have the knowledge to say for sure what happened.

Finally, a college professor stated,

My mother used to say, "Truth is progressive whether it is scientific or religious. The truth I believe today is only in the light of my current understanding. Your generation will understand more, both religiously and scientifically." I respect that position very much. All understanding leads to more questions, and they ask what comes next.

Theistic evolutionists were generally characterized by being open-minded, searching and anticipating new insight, and being willing to admit the tentativeness of their position. Samples of the few comments which betray a lack of intellectual curiosity by the theistic evolutionists include: "I don't give any thought to this opaque subject. It will be argued about forever. My beliefs in God and church deal with spiritual man and not science," and "I guess my faith in God is complete and how he did it really doesn't get me too excited." One person, who did not sign a name or fill in a church, stated, "Our church does not encourage us to question."

Theistic Evolutionists: Doubt

This research revealed that the theistic evolutionists were much more prone to entertain doubts about the subjects of origins and development than were the creationists. Creationists enjoy certainty by trusting the literal accounts in Genesis. Those who try to relate the evidence of science to a creator God see many inconsistencies and encounter problems which as yet are not fully explained. Skepticism is a common quality of critical thinkers. They are vigilant in
considering new information and integrating it into what is known. They remain open to new perspectives and ready to dismiss outdated assumptions. The doubts of the theistic evolutionists were expressed by several individuals as follows:

We are on a journey of life, and sometimes I will doubt but I will also be open to new ways of looking at things.

As for now, I am so undecided that I cannot even articulate my questions.

There are too many gaps in the evolutionary cycles but strict creationism is no answer either.

I'd love to have proof positive and all these things explained so as to remove all doubt in everyone's mind, but accept the fact that this is not possible.

A sentiment expressed by several in different ways was, "Of course, there are areas of uncertainty, but they are cause for both awe and wonder, and further learning and understanding. I love living with possibilities."

One woman, an elementary school principal, stated a view common to the theistic evolutionists, a willingness to live in the grey areas and be amenable to considering whatever might come along. There was no assumption of "arrival."

"Hopefully I'll always be open to uncertainty--green and growing," she wrote.

Other questions expressed by theistic evolutionists which contribute some insight into their thinking follow:

1. Why are creationists so literal when nothing in life is black and white?

2. How do dinosaurs, Noah, and Neanderthal man, carbon dating, and archeological findings fit with creationism theory? Why is
there no reference to dinosaurs in the Bible? (There were 9 references to dinosaurs in the questions.)

3. What is meant by biblical time? (There were 13 questions pertaining to how a day is defined in the Bible or other aspects of biblical time.)

4. How does Genesis and Adam and Eve fit in with evolution? (There were nine references to human evolution in the questions.)

5. How much did biblical writers embellish to impact the reader? Did the biblical writers create creationism?

6. What or who caused the bang? How did something come from nothing?

Theistic Evolutionists: Belief and Belief Change Basis

The primary trigger to belief change from creationism to theistic evolution was increased education. It was mentioned over and over as the precipitating factor in belief change. When participants were asked what triggered the belief change which had been indicated on their questionnaires almost all of them began with "When I went away to college . . ." Seven individuals specifically listed a college course in paleontology as being pivotal to their belief change. Four of these were from the college sample. Representative comments with respect to education from theistic evolutionists were:

The more science I learned at college, the more I saw God's hand in every phase of evolution. As a child I was taught about Adam and Eve, right out of the Bible, not using any thought. When I went away to college, I saw that that was for children, sort of like Santa Claus. It works okay for a while and then you move on.

A woman who is a writer explained:
I came from the South where biblical interpretation is very literal. Not until I went to college and started reading literature and writing did I develop an understanding that the creation story had truth but wasn't necessarily literal. I saw it as part of the great oral history being mythic in nature. It has a great message of God, of his creative activity, and willingness to relate to us, and even of right and wrong. That comes through. But the literal details just do not allow consistency with natural science.

One woman described her journey as follows:

Before age five, the only explanation I had was creationism. After I was exposed to science and evolutionary theories in junior high school I began to develop the beliefs I have today. When I went away to college I looked at what made sense to me and what didn’t. What made sense was that evolution had taken place rather than boom, we're here.

An English major from the Presbyterian sample said, "Somewhere around junior high I decided the logic of evolution was more believable than the lovely, poetic, symbolic story of creation, and I haven’t changed my mind since."

The poignant journey one young woman with two little sons took is summarized below. Her struggle to bridge what she had always been taught with the new insights at college is clear and not unusual. She was compelled to replace inherited authorities with new ones.

Until I went away to college, my religious beliefs were directed by my parents and my church. I believed in creation because I thought I had to in order to be a religious person. Even in middle school I thought, "This doesn’t sound right but I have to believe it." I thought that if you doubt, it was bad. When I went to college I took quite a few religion classes, and for a while I almost went the other way and said, "I don’t believe at all." I guess I was rebelling against going against my own deep down beliefs and felt none of it was right. I created my own personal belief. My professors, obviously educated, showed a broader belief, and the history was included and it was more concrete and I said, "I can believe that." There was some
actual evidence along with the religious faith. That is something that
I feel very comfortable with rather than relying strictly on faith and
saying the heck with all the evidence. Sometimes I think I shouldn’t
think too hard about some of this for it might get me into
questioning too much and then I just leave it as is and take what I
want of it.

When asked if her parents were aware of her belief change, she stated, "My
mom doesn’t know. She wouldn’t be too happy. But I am comfortable with it and
we just have never had to talk about that subject." In her questionnaire she asked,
"Is my belief frowned upon? More specifically, will I end up in hell for believing
something different than creation as the beginning of the Earth?" This young
woman was not the only theistic evolutionist who expressed concern about
salvation status and it is a commentary on how critical and consequential
creationist belief is in some religious settings.

A woman pastor in the Lutheran tradition related,

I went to college, and that was my definitive spiritual geography. Do
you know why? It was because they made me doubt. It never
became mine until I doubted, and then I could turn around and
make the Christian perspective mine. I could go on in my life, not
just parroting the things I had been taught. My parents were
wonderful but they were narrow. I went to a church college which
taught me to doubt. It was the best thing that ever happened to my
faith.

A dynamic teacher from the Presbyterian sample who enthusiastically read

Genesis and some other materials on the subject the day before the interview
stated,

I gradually came to understand that the story of creation was factual
and yet somehow more magnificent and illustrative of the wonderful
God. Studying geology, I understood that God used evolution as the
process by which he created the world and continues to create it. Somehow believing that God just went "poof" and there it was, diminishes him. Genesis was to tell us that he did it.

Many of the participants expressed, in a variety of ways, that evolution enriched the Genesis story, that they felt it was more awesome than a spontaneous miracle, and that it made them worship God as they were slowly given insight into his actions. In that respect, belief change was exciting and inspiring.

A physician nonchalantly stated,

At a young age I believed the world was created as stated in Genesis. As I studied, especially the scientific subjects, I became aware of the evolutionary process. It seems a logical step to assume that God utilized this process to create our world.

When asked if this change was difficult, he said, "Not at all. It was the logical step to take. It was growth." Many theistic evolutionists did not find belief change that uncomplicated.

Besides increased education resulting from going away to college, other factors contributed to change for theistic evolutionists. An empathetic pastor shared the circumstance by which he underwent belief change:

Probably being challenged by the anxiety and pain of people who have to be black or white is what helped me integrate into comfortable grey, or checkerboard, or whatever. I could see the loneliness and frustration of needing to be right. I can take what comes now with ease.

At an interview in a park near a dinosaur dig, a woman from the Lutheran seminar explained,

The issue with me came when I started working at the dinosaur dig and tried to put the scientific time line and the biblical time line into
some kind of perspective. The paleontologists posed a lot of questions at me at first, but when I was actually standing right there and heard 80 million years and was holding these dinosaur bones in my hand, it was proof. I think this is the only realistic way to believe. In high school we talked about evolution but it wasn't real to me. This made it real. I have seen fundamentalists tell their children at the dig site that this is not true, and I just can't understand how they can stand on that soil and see the bones and the layers and not realize something doesn't gel.

This woman showed intellectual honesty. She had to confront the reality of the data and construct it into a reasonable belief paradigm. She was willing to go where reason led and appeared comfortable with that consequence.

A Lutheran teacher expressed her ambiguities and willingness to reserve judgment on this issue:

I am still in the process of change. I believe in a creation but I also believe in science and evolution, so I think I am kind of a middle of the road person, believing in an evolutionary creation. I don't see why God could have not planned it that way. I think that he had the power to set evolution in motion. I know there are a lot of missing links and problems with evolution, and that is what the creationists zoom in on, but I am just so wishy washy. I don't have any absolutes on this one.

One woman, when asked what caused her belief change, answered, "I was raised an Assembly of God member . . . I became a Lutheran." When invited to clarify her statement, she said that everyone believed in creationism in her former setting but that she learned about more options in her present church.

A retired Christian biology teacher said,

Evolution was a dilemma for me at 15. You write one thing on your biology tests and pray to the God who created everything on Sundays and nightly. It takes years to try to put all that together.
She further expressed the frustration she experienced for many years having to protect herself from recriminations, not free to teach a theistic evolutionary belief:

A host of students asked me for 35 years to explain it. It was usually the same. Something about my having knowledge of and a degree in biology which includes evolution and that I could present the theory, but that I had no degree in theology. I had my private belief system. I could be severely reprimanded teaching a religious doctrine (which I couldn't do anyway being a lay person). Separation of church and state, blah, blah, blah. They always asked me, "But what do you believe?" I sort of muttered that I believe in God the creator and how he did it all was his concern. So there you are.

Additional comments which contributed insight into precipitating factors causing theistic evolutionists' belief change were:

1. Literature was vital to my expanding beliefs, especially by Eiseley and Gould.

2. Increased Bible study. I learned to see the Bible in a nonliteralist way. (Six individuals made reference to the growth they had experienced being exposed to a more scholarly means of biblical interpretation.)

3. The laws of science don't lie. I had to change. The bones. They didn't get there on their own.

4. The study of the Scopes monkey trial in high school started me thinking. I could see that the creationists had a losing case.

Theistic Evolutionists: Biblical Interpretation

In general there was more variety of opinion relating to scriptural interpretation in this group when compared with the creationists, and less
expression of certainty that their viewpoint was correct. Most, though not all, did not hold to a literal, inerrant interpretation.

When asked how she interpreted the Genesis accounts, an elder explained,

I think the Genesis story has to be seen in its written context and the way they communicated back during that time. We look at our newspapers and we read them in the context of our culture at this time. How do we think it was any different then? A newspaper from the 1800s was different or even the 1960s, or even today from one geographical area to another. They have different terms.

If God is always searching for the sheep, he will find ways in all those avenues—music, poetry, allegory, to find them. The one time we see it, how many other times did we miss it? The part in Genesis which tells me to be more inclusive, and more open and fair, those things are redemptive, and are healing and we take them literally. There is no future if we don't become healers and allow diversity. What is the spirit if it is divisive?

The times, as well as the cultural context, was considered by this woman to help her determine the meaning of the writing. She saw reading the Bible as a challenge, with many literary forms and cryptic thoughts waiting to be brought to the light. Her insight in looking for larger concerns such as inclusivity rather than getting engulfed in particulars is noted. Critical thinkers work at identifying areas of consequence.

An artist from the Lutheran seminar commented,

Archeology helps explain what parts to take literally. It tells us what happened with those societies and helps us understand their cultures, which were very different. We need to have concordances and the best of scholarship available to help us interpret the Bible and to identify the biases and propaganda and cultural baggage that is included. Christians should work harder to use as much support help as they can find to interpret these ancient writings.
The call for more scholarship among Christians is welcome and a fundamental activity of critical thinkers.

A Christian educator said in an interview on a park bench on a lovely summer afternoon:

I think we need to start way before confirmation to help our young people understand what the Bible is and then they can go see the movie "Jurassic Park" with all of the details and they won't be frightened because it won't threaten their sense that God still created and maybe that is the way he did it. It would help young people to correlate science and religion from an early age. How do we know how he did it? They can keep their minds open and not feel threatened.

A woman spoke to the significant role the Christian education of children can play in ameliorating some of the confusion on this topic:

We don't need to bat them over the head with theistic evolution, but we need to share our own certainty of the who of creation, not the how. We need to start implanting in them the option that the Bible can be seen in more than just a literal way, and show them the many other areas where we read the Bible nonliterally. We need to teach them a course in the Bible as literature and how it has so many rich literary forms. I think it would become a more friendly book then too.

A pastor explained how he taught biblical interpretation to his congregation:

I don't want to blast them with the way I believe interpretation should be understood because I wonder if that is my ego. I would rather simply say, "This is the revelation I have. Yours may be different, but I want you to know the extent and openness that I have." I will always be on the journey of changing and working through the grey areas, but it is so freeing to be able to question. I don't feel bad about it. To me, questioning brings you to a safer place, not a more dangerous place. We are going to someday look back at Scripture and see new light just as we see it now and our
grandparents couldn’t. The revelation of God doesn’t end. It is still occurring.

Several theistic evolutionists referred to the fact that God was still at work in his world. One man stated,

Some Christians are limited to thinking God only acted in the past in creation or at Jesus’ resurrection, or will act in the future at the parousia. I think that is shortsighted and diminishes God. It infers that he is not doing anything in the present. They talk about the fixity of species, for instance, not allowing change. But change is occurring.

A grade school teacher expressed:

If God was a magician and just went “poof,” then why have things continued to change? The different animals and plants that live here today compared with what was before. I think it is to God’s credit that he could figure all that out, and it makes him more enduring, more everlasting than if he just went “poof” and it was all done. I think change is part of his design and it’s marvelous, so lively and leads to such variety. It makes sense that if the environment changes the living things have to change too.

A young man, who admitted that at that very time he was questioning his faith and appropriate Scripture interpretation, stated in an interview,

In the end, whether it is the end of the world, or our end, I think we are going to look at one another and say, "My gosh, did we make biblical revelation complicated." There are no strings to "God is love." I would like to have the Christian world accept each other as having slightly different revelation. Jesus didn’t deal with everyone exactly the same.

A pastor summarized,

We must ask ourselves, "What does the Bible say as a whole?" Critical thinking helps us sift out what is important. Jesus had a message of mercy, love, justice, and compassion. Micah in the Old Testament got the point: to do justice and love mercy and live humbly. If we could look to what is important and concentrate on
those things, we'd forget about the small things which separate us
and we would have a better message to tell the rest of the world.

Several people, including some pastors, commented that what pastors learn
in seminary about biblical interpretation and what the lay people understand are at variance. One man said,

To teach lay people to interpret Scripture intelligently makes it more complex and they are left with fewer absolutes. They can lean on their own more simple interpretations, which may be wrong, but to teach them the best way to interpret upsets their world view. It is very difficult for pastors to teach a more critical approach to people who are already comfortable with the way they interpret it. They don't want to get into any uncertainties.

A young man, sitting in his beautiful log home by a river, spoke of the threat that a new means of biblical interpretation might mean to some lay people.

The known is comfortable and the unknown brings risk. He stated:

The churches at the national level have more vision and are inclusive and the pastors are trained, but the congregation doesn't understand and there is a threat. The lay people, if they were taught everything, would end up somewhere they didn't know they were going. I wonder sometimes if they should just be left in sort of an "ignorance is bliss" state.

Several other interviewees spoke lightly of the threat that a new means of interpretation might engender. A Presbyterian man said,

Who cares if everything in the Bible isn't factually or historically true? We can look at a story like Jacob. What do we come up with in the end? The concepts that he overcame great odds, struggled with his faith; he was the underdog and he overcame with God's help and so can we. That message comes through whether it was historically true or not. It doesn't bother me whether there really was a person named Jonah or Moses. The message comes through those stories about how people relate to God and how God relates to people. That is the whole idea of it and we don't need to get hung
up and divisive about whether it was literally true. It should not bother anyone’s faith one bit to see the Scriptures in this new light.

A Lutheran pastor explained,

I think you read the Bible just like you go through an anthology of English literature. You take Casey at the Bat and King Lear and you read them differently. What do you learn from Casey and what do you learn from King Lear? You have to read with guidance and discernment, what was said, what was the intention. The Bible was written by many different writers with different intentions and different means of accomplishing them. It takes some work to decide what the author really meant especially since you are working from such a different culture and different time.

This pastor, who had worked with students at a prestigious engineering school, commented that the majority of them preferred a biblical interpretation which was literal and had absolute answers. She concluded that their immersion in the scientific method had given them a mindset to go for literalism and absolutes and they did not seem as comfortable dealing with ambiguities which the liberal arts students appeared to handle with more ease. She stated,

That surprised me at first, that all these really bright people would be into literalism, but the more I thought about it and what they were like emotionally and how they had been trained, it made sense. Of course, just because they were trained well in mathematics and engineering doesn’t mean they have a sophisticated means of interpreting the Bible.

One interviewee, a Presbyterian elementary school teacher, commented, referring to people who cannot correlate the Bible with science:

What do they do? Where is their faith? Their whole faith is built on trying to justify the Bible, protect the Bible from questioners. When other people challenge Scripture, they take it very seriously, thinking something is out to get them.
Another Presbyterian, a lady elder, expressed,

Some people leave a church when they hear the pastor does not take the Bible literally or when the church is found to be open to variation of interpretation. There are so many variables and grey areas in life, and there should be freedom of conscience with the individual. They don’t realize that the freedom to choose is a compliment to their own spiritual maturity and they don’t understand that they are not under a law of what to believe. They seem to prefer being told and being where everyone else believes just the same as they do with no opportunity for personal revelation or interpretation or growth.

A young man from the college who obviously had thought considerably about biblical interpretation and whose interview was in his home near his pet boa constrictor said,

This might offend a lot of people, but in all truth I’d have to say I think the Bible has a lot of good teachings, but I think it was written by man and right there means it’s fallible. Everything we do is fallible. I would have to say that some of it is Christian mythology. I think if you interpret it literally you will be in a world of hurt. There is some wild stuff that went on in the Bible that people of science are going to say is pretty hard to believe. You have iron floating on water and the sun standing still. The teachings of the Bible are good but they are teachings through stories which they told from generation to generation and they got embellished. The meaning is still there but the story has gone out of reality. Even though some of the Bible is story or myth, a lot is accurate history.

A woman, active on a community preservation board, stated,

I think the Bible could be interpreted in a hundred ways. I think Genesis is a nice story and there are a lot of other nice stories in the Bible, but the people who wrote it were only human and humans can interpret things differently. Every culture has stories but they aren’t about literal truth. They tell things about life, about God. Why would Christianity be any different? People need that way of explaining and it’s how you explained the world to your children. The Native Americans have creation stories also and they don’t use empirical data. What they do is similar to what the ancient Hebrews
did, devise and repeat the stories down through the generations, and they are part of the culture and part of the way they explain the world. The Bible must be seen as a record of those stories. They explain God and his relationship to us. That's what Genesis does, even.

A man who had recently begun serious Bible study summed up his understanding in the following manner:

It's easy to sit around and point out the discrepancies of the Bible. But first of all the Bible was never written as a book. It was written by several different people, some of whom are unknown, and is a collection of religious writings that was decided by a committee of men. It's the greatest book that was ever written because it explains the human condition, and shows a way to alleviate the human condition. If you believe that this is all there is to life, it will not speak to you, but if you believe there is more to life than Earth, then it speaks.

A young Presbyterian father and elder exclaimed, "I am not a Bible scholar but don't tell me it is the words of God. Tell me it is God showing me the human dilemma through human writers, and that he is going to come fix it."

Skepticism, in some religious circles, is discouraged and perceived as a negative quality. In critical thinking, it is encouraged and recognized as a positive quality. A woman with a healthy skeptical mindset said,

I don't remember reading that it says there were six 24-hour days in the Bible. People were not as precise then with the way they thought and wrote. They said people lived over 900 years back then. Either they didn't care about being accurate with time, or if the people did live that long then you can see there definitely has been some kind of evolution... Either way, the strict literalists have some problems.

A young wife of a pastor explained,

I try to look at the Bible in the context in which it was written and the time and what it was speaking to at the time, like the part where
they talk about women speaking in church. In those days, if women had been allowed to speak, men would never have gone and the Christian movement would have fallen apart. If women were told today they couldn't speak in church they might leave because that is not what they are used to. So those commands were given in the light of the culture of that time and are not meant to be applied to our cultures. The Bible applies in spirit to this day, in might, but not by its letter.

The fact that, even within the Scriptures, different attitudes are appropriate in interpretation is expressed by this man, an elderly Presbyterian:

The Old Testament was pretty dictatorial and then when Jesus came it was for a more thoughtful, gentler, softer religion, putting much more burden on the individual. Back earlier the powers that be in the religion would take care of it and give the rules and tell everyone what to believe, but once Jesus came it was more personal. He addressed individuals and has personal relationships with people. All of us have a different experience with him and with his word and that makes us special.

A young woman from the college class explained, with considerable insight,

The story in Genesis, as far as evolution goes, is sort of an evolvement. There's a process there. When I took my paleontology class it became clear. I never did think that God just went boom, boom, boom. I thought there was some kind of process involved. That doesn't take away from him creating the Earth. Evolution doesn't disprove God whatsoever. It doesn't change the Bible. It just changes the way some people interpret it.

A middle-aged woman from the Presbyterian group, who was interviewed in a pancake house, expressed the freedom felt with the wisdom of some years:

I think the Bible is inspired but I don't believe it is inerrant. There are too many things that don't match. I don't think God was whispering in the ears of the authors as they were writing things down. If I had been walking with Jesus and writing about it, it would definitely be inspired by God, but it would be my work and have some of my memory lapses or inaccurate perceptions in it. In spite of that, the main message would get through as God wished. I don't
A pastor from up near the Canadian border commented,

I am reluctant to open up this way of thinking [a more figurative, less literal view] in my congregation because it takes a great deal of pastoral care to bring one around to a more scholarly way of interpreting the Bible. It took years and years to bring me around and I can’t just throw this out at them and let them struggle alone. I do it little by little. I will take a text and we will talk about it and then I will say, "Here’s another way we could look at that passage." I tell them there are a variety of ways. Some people are too solidly ingrained in a literal view and can’t look at it any other way. That is fine. They must stay where they must stay. But one of the drawbacks is that we have generations of Christians who don’t interpret the Bible well. It is taken for granted at seminaries that you critically think about the Bible, and seminarians often go through difficult times, but they have the luxury to be with a support community which helps them work it through over several years. A lay person hit with this new way of looking at things is not so prepared or supported in that change journey. I, as a pastor, just do not have the time to be there for them, either.

A Presbyterian layman who had some seminary training spoke with insight, showing critical thinking skills applied to biblical interpretation. He proceeded slowly, expressed humility, and sought help from beyond his own wisdom.

I think we have to be very careful in being too restrictive with the Bible. If we think we have it all figured out and know exactly what it says, then we are in trouble. I think God helps us understand and helps us little by little. Some people feel they are doing the discovering and it is the only right way to know it. God is so big, and his ways are beyond finding out, and if we think we have found it out, we need to be cautious. There are too many questions to have it all wrapped up.

While enjoying tea and cookies in her sunroom, a retired teacher in the Presbyterian sample described the pleasure of autonomous thinking:
I have a cousin who really knows the Bible, and he keeps saying, "That is what the Bible says, and if you can't accept it you need to read it more and pray more." But that isn't a complete enough answer for me. The Bible says something here and there that doesn't always correlate clearly and it's not as easy as just "that's what the Bible says." I feel that once you get over the hump of thinking you have to interpret the Bible literally you are free to explore ideas and try other ideas and to reject and accept and you feel God is working with you and it's exciting. It's not that you just believe what someone else has found, like you are a puppet. You feel God is working with and through you, yourself, and it is part of an exciting relationship with him. I find it is so liberating. I was in a straight-jacket before. It makes you think more and you feel more certain about what you finally conclude because you have struggled with it, not just accepted it from someone else. It's a lot of work, though.

A Lutheran commented on the doctrine of creation:

I come from a confessional church. Our confessions say, "I believe in God the Father Almighty, maker of Heaven and Earth." What does that say? It says that God did it, but it doesn't say six days of 23 hours and so many minutes. It says God did it and that is what is crucial. If science unravels some of the specifications, that is exciting. That doesn't threaten my understanding of the Bible, that God the Father Almighty made the Heaven and the Earth.

Two young men, the first one a banker and the second a salesman, explained their understanding of the Scriptures in the following ways:

I believe the Bible is the word of God, but I don't believe that he put his message in the ink and had the scribe write it down, word for word. For instance, to read the different gospel accounts, they aren't the same. The disciples' names are not the same. I could point out many other examples. Also, I do think that you almost have to turn off some of the elements of the Old Testament. I have trouble with all the bloodshed.

There is a new translation of the Bible which really tries to make it more contemporary. I got to thinking, they got these scrolls, and the Hebrew and Greek, and the Germans and English are all translating all these manuscripts and some of the punctuation or vowel marks
are missing. How can they know for absolute positive sure that this is exactly what was said? So as I read it a sense comes about in me that this is an explanation. The creation story is an explanation.

Perhaps the following statement summarizes these points best: "I feel that you don’t have to look at the story but at the message of the story. That is what is important, and you can’t ignore science, so that seems to be the only way you can handle the Genesis account."

**Theistic Evolutionists: Science/Faith Relationship**

On the whole, the theistic evolutionists could see little threat to faith from science. One man said in a restaurant interview,

What is science trying to accomplish? They are not a bunch of unbelievers trying to destroy faith. Science has led some to be extremely devout and others not. Science is a way of getting at another part of the creation evolved order. It shouldn’t be seen as inconsistent with theology or poetry or music. They are all ways to explore what God has done.

Two women, good friends, were interviewed at the same time on the banks of the Missouri River as it flowed through Great Falls. Their responses to the question whether science helps or hinders faith are as follows:

Science enhances faith. Look at the leaps and bounds of science—medicine, aerospace, all the way down. God works through technology but we have to be responsible. I don’t think science has hurt faith. If God is in it, even this subject of origins, I don’t care how it happened. God gave us the science. It, of itself, is good, then. Its what we do with it that can hinder.

Science enhances faith. The technological advances which some think crowd out God make me just feel that he has given us great minds to figure them out. That doesn’t diminish him or my faith.
The more science I discover does not cause problems in faith, but enlarges it and leads me to marvel all the more at the greatness of God.

A student from the college paleontology class confirmed that science was just one more way to see God.

Science could never hurt my faith, for it is real, and God is real. Paleontology and any other science just has enlightened me about God. God is not a magician but the master scientist. He made it but we don’t know how he did it, and he gave us brains to try to figure it out. I do wonder if we will ever get to the bottom of it.

An engineer, a Methodist attending the Lutheran seminar, made the following observations:

In statistics, I suppose there are many, many examples of both situations where science either helped faith or hindered it. Maybe it has discouraged people from going forward with their previous faith, but that is growth and not hindrance. Churchgoing is down compared to previous days and I am sure scientific discovery has played on that. As always, increased knowledge just helps me realize how big God is and how little we know. You can look at that as something that brings you to God or it can detract you from him if you get all tied up with the knowledge and don’t look beyond it.

Only one theistic evolutionist believed that faith has been hindered by science. This was an active Presbyterian layman.

I think science has not affected faith for good. Things which science has discovered have become our god, you might say. The materialism that science has brought interferes with time and desire for faith.

Others: Critical Thinking and Doubt

The majority of the individuals who checked "other" (which included those who were evolutionists who believed the world got here by chance, those who were
undecided, or those who had some other belief, usually a slight modification of creationism and theistic evolution) showed they had given considerable thought to the subjects of origins and development. Several expressed the doubts and questions characteristic of people in transition. It is not unusual for individuals who are seriously considering the various dimensions of the problem of origins and development to waver back and forth as information arrives from all sides. Some of it is fallacious, some misleading, some incomplete, and the astute thinker must weigh it against critical thinking standards. The young man who made the comments which follow demonstrated this vacillating experience. Even those who have committed to a position on this subject matter find themselves questioning and doubting, as new voices are heard and ideas considered.

The evidence I have seen probably doesn't point to the Genesis account. I find myself going along for a few weeks at a time believing one thing and then hearing something else and believing that. I am not a creationist and I am not an evolutionist. I am a Christian. I think you can have a little bit of both and get back to the basics that Christ is our Savior and let God be the judge. When God said to Job, "Were you there when I created the world?" We think we know it all. We don't know anything. The more we learn the more we learn how little it is we know.

A woman's struggle with the variety of viewpoints could be followed as she spoke.

I listened to different voices. You can't believe both. Within the Lutherans one person said yes and another person said no. I remember what a friend said, "You either believe the whole Bible or you don't." I really thought that was a good point. I ask myself, "Do I think Noah's ark could be true?" My gut feeling in spite of all the evidence is to go with biblical creation. As it says in the Bible, the wisdom of man is foolishness to God. On the other hand, people
clung to the belief that the Earth was the center of the universe and in my own mind I wonder what it all means.

A woman pastor put into perspective the two major positions on this subject matter with the role biblical interpretation plays in approaching a belief. Rather than commit herself, she desired to keep an open mind.

I don’t think creationism and evolution are in competition or conflict since they are addressing different issues and questions. The creation story in the Bible may have expressed the cosmology or science of its day and evolutionary theory expresses ours today, but that may and probably will change. Evolution is a theory and is evolving itself! I am open to see what we will continue to learn.

An elderly man said,

Admittedly, my schooling is limited, but I have always been interested in science, particularly in geology. It would appear that the time frame of proven geologic age of the Earth and the universe are at odds with that of the Bible. Must this be reconciled through simple faith or is there some explanation of this in the Bible? There is plenty I can’t explain! I’m not sure I even know what questions to ask. It’s like believing parts of both sides but not knowing how to reconcile the differences, and also coming to a sort of acceptance that the answers may not exist, if that makes any sense at all.

A Presbyterian who attended the creationist seminar stated,

The more I get into learning, the more I believe it happened just as the Bible said. I was a geology major in college and I understand all of that. The only thing I can say at this point is that I believe that it happened in six days. I probably can’t defend that to someone. I am going strictly by faith. Recently I was really struggling with this after the seminar, and I was lying in bed and telling God stuff and that I didn’t know what to believe. I said sarcastically, "Well, I know, God, it’s not like you just left us a book about it." Then I heard, "Yes, I did." I am not the kind of person that believes in spiritual happenings. They don’t happen to me, but that was very clear in my head that it was the Bible. That is how I interpreted it and that’s what I am going on. I can’t defend it or argue it and will have to wait and see what happens.
This woman demonstrated some of the complexity of the intertwining of the intellectual and the spiritual dimensions in this amazing dilemma. It often appeared that those people who were extremely devout as well as very intelligent had the most difficulty reconciling some of the perplexities. They wanted so to conform to what they felt was the precise message of the Scripture, yet their minds gave them cause to reconsider. This is where an inquiry into higher criticism can be beneficial, enabling them to couple what they read in geology with what they read in the Bible.

When asked if she had any doubts about her present belief, one woman said,

I would say I have uncertainty. I think God will reveal what he needs to reveal when I am ready. As I search he brings people or articles into my life that lead me further so I feel that he will reveal it when I am ready.

Many qualities of critical thinking can be seen in the majority of the comments presented. Reserving judgment, conditional acceptance, open-mindedness, independent thinking, intellectual honesty, lack of dogmatism, willingness to live in uncertainty (perhaps this could be called intellectual patience), faith in reason, and a perseverance in attaining truth can all be seen in their remarks.

Others: Biblical Interpretation

One Presbyterian woman wrote her beliefs on biblical interpretation in detail:
I don't believe there are mistakes in the Bible, but I think there are misinterpretations. I am really struggling with this. I don't think God would give us something to confuse us. When I pray about this, I would like a sign to come down and say, "This is what you are to believe!" But that never happens, of course. I want to believe that it is literal, but I still have some problems with it. Sometimes how I resolve it is to say, "That is worldly wisdom, and we see so little." God sees the great big picture. We're interpreting that little slice and he sees the whole cake.

When asked if she believed in a literal interpretation of the Scriptures, one woman said,

Maybe the word literal isn't the right word. I do believe what is in there is true. I used to read it literally but am finding that there is so much more there in the English words when you study the Hebrew and Greek. It's not a book you can just pick up lightly. It is difficult. I'm sure a lot of my interpretations aren't what God meant but he will bring me along.

A Presbyterian who was on active duty in the Air Force explained,

I have a kind of classic, liberal view of the filters through which the Bible was written and what the people knew and the technology available to the world when the Bible was written. I think the Bible is inspired by God by a human filter, a human lens. So to try to interpret in light of what we know in today's world seems to be a futile effort. My sense is that in Genesis there are two creation stories and it's pretty hard to take a stand on one and say this is accurate and the other one isn't. It was part of an oral tradition, passed on by the best story tellers, and eventually it was written down. I have no idea how old those stories are or how much translation came through but what does come through is that God was in it. I think the main thing we should be thinking about today still is that God is still in it.

A businessman who is a Sunday school teacher at the Lutheran church said,

I don't think in this day and age that the average Joe has had enough background in the languages and the history to understand the poetic language in which the Bible was written. I don't think it was meant to be taken totally literally.
A mother of four children expressed a concern many have when a more liberal, less literal interpretation of the Scriptures is considered:

There is a danger that when you take one step away from believing the Bible literally that you will take another, and then I heard that there were people in England who deny the resurrection and the virgin birth. They are getting to the point where they don't believe anything in the Bible. It’s easier for me to believe all of it and if it turns out that that's not right, then that's ok.

While these comments show insight, all of them attest to the need for more instruction among lay people on the correct means to interpret Scripture in the 20th century.

**Others: Science/Faith Relationship**

Two interviewees who identified themselves as "other" expressed their views on the relationship between science and faith. The first explained that he was in the middle between creationism and theistic evolution and the second that he was undecided. Their comments follow:

It depends on the person. It probably confuses some people. If you aren't rooted, it could confuse you. It depends where the person is in his faith.

Science confirms to me that God is in it. I grow in awe every day at the complexity of the plan. The more we know, the more we know we don't know. I think the complexity and beauty point to God and enhance my faith. But then science has created distractions which I think hinder faith. People examined faith more before we had TV. Kids went to Sunday School instead of playing Nintendo. All the distractions that affect the church's relevance to people's lives make science a negative in that respect.
The Stress of Change

The literature in the area of belief change indicates that change is accompanied by stress and resisted, especially if the belief is in the area of the sacred or impacts us in a highly personal way. It is not surprising that many of those interviewed who had experienced belief change expressed how difficult their experience was in undergoing that change. Some of the change experience testimonies follow.

One man stated, "Evolution is, for a Christian, a deep-belief zone and people get stressed out about deep beliefs, especially when you suggest change. It's an uncomfortable zone and people get scared."

Another man explained,

When I got into junior high and saw science and logic I started to move away from the Genesis story. I thought a lot about it. I felt guilty to be moving away from Genesis to something that wasn't exactly condoned by the Bible. If you read the Bible, evolution is not there.

The wife of a pastor related how her husband changed his belief in seminary:

His second year I started seeing how it caused him to think for himself. He was being challenged by his professors not to take for granted what everyone said but to really think it through on his own. And he got to consider all different kinds of viewpoints. He shared that with me and I began to think that way too. It ripped apart my basic beliefs on the creation story in Genesis and I started to think what my faith was based upon. I struggled for a long time on how to be honest to scriptural interpretation. It was not an easy time in my life. I think as Christians we should hold each other accountable for being challenged in our thinking.
This young woman expressed the pain and anxiety that belief structure change can impose. While at times belief change is exhilarating and freeing, at other times it is extremely distressing and requires a strong support base and patient perseverance.

One of the college women shared:

Things need to be thought. You need to step out of what is comfortable thinking and say, "This is a grey area." It's fun to be with people where you can say what you are thinking without them falling off a chair. Some of my authority figures made it difficult for me—I didn't want to even tell them that I was considering a broader view. That put a barrier between us which I regretted.

The remembrances which follow relate some of the distress associated with belief change. Alienation, confusion, long-term disruption, anger, uncertainty, discomfort, and devastation are mentioned. A Presbyterian teacher recounted:

I grew up in the South where I was taught the literal view. I was shocked in college when I learned differently. It was a real crisis for me. I went to my physics professor, who had a strong faith, and asked him to help me. It took 10 to 15 years for me to be totally changed over. That was a long, hard journey. I moved from an area of certainty to one of uncertainty. I was confused. It was more comfortable the other way but I'm getting used to it this way.

A Presbyterian man described his experience when he was first exposed to an alternate belief paradigm:

When I went to college in the Midwest, my physics professor first got me started to think about another way of seeing creation. At first it made me mad. I bought a half dozen books and I began having suspicions, and that was the crack in the dam. Meanwhile, my wife was a biology major and she told me about the data she was receiving. Some of my Christian friends laughed about evolution as though it was not even to be taken seriously. It was a negative thing to talk about. I felt the truth was one and that I could not be a
scientist and go to church on Sunday. I had to listen to this and incorporate it even though I wanted to forget it. But now, I see how the two can be assimilated and how both truths can be one. I sometimes have more doubts now about God than about evolution. That’s an amazing turn around.

Pastors seemed to regularly face the conflicts of belief upon entering seminary where biblical interpretation is seriously investigated from a scholarly viewpoint. A Lutheran pastor explained his experience:

I grew up in a pietistic setting and was taught special creation. I believed all the absolutes and thought my life would be smooth. Then I went to a high school of a different denomination and I was a minority there and they taught evolution. I began to think and studied the different creation stories and did a literary analysis. I began to read the Scripture in a new way and questioned creation theory. Then I went to seminary and studied higher criticism, read the history of Israel and became aware of archeology which supported it. Doors kept opening up. The change was discomforting. My dad was a pastor but he was laid back and didn’t mind my new belief, so that part wasn’t hard. My last year of seminary I became a reader for an Old Testament professor whom I really respected. I was made to think on a deeper level: who the Scriptures were written to, what culture was it in which it was written, how did the Hebrews think back then. To this day, when I drive by a fundamentalist church I am angry for I feel I was betrayed, lied to, and deceived. Sometimes I even yell at them when I drive by.

Another pastor related the pain of his belief change.

I had a very strong theological base and didn’t think anything could change it. I fortified myself by reading the Bible through several times. Then in the course of study after leaving seminary I was honest and met the data of science and archeology head on. I felt alone and didn’t have a sharing base among the clergy. When I mentioned my questions and doubts subtly to my peers they seemed to refuse to entertain any thoughts that were different from what they believed. I think Christians are so insecure in exploring reality. It was like a tidal wave went through me as I realized my theological
suppositions were not correct. I even asked if God could be loving and allow me to go through such emptiness and despair.

A third pastor explained his shock, upon entering seminary, to learn that the interpretation he was always taught might be inaccurate.

I was told the creation story in Genesis was a myth, right away, my first semester. I absolutely flipped. I rethought my entire theology and went through anger. I took it out on my fundamentalist background. "You didn't teach me the truth, so I am going to teach you the truth." It was very difficult for me to comprehend all of the theology I was learning and change these beliefs at the same time and I got on probation. I dropped out of seminary and worked on the campus for nine years before I was ready to return. I am now able to appreciate the pain that people go through readjusting their theology. I am very sensitive to those who take the Bible literally. But I let the Bible speak for itself. I draw Genesis 1 on a sheet of paper and show them the bowl. The sun wasn't created until the fourth day yet there was light on the first day. People say, "Hey, what's going on here?" They can see it for themselves. When you just read the Bible as it is, you can see the problems with the creationist belief. I am so happy I came through this experience, that I wasn't left a fundamentalist. I have peace now. I have an inquiring mind and would have gone through this experience sooner or later and might not have had the support I received in the seminary community. They didn't realize how it jarred me, though. I tell people that we approach the Bible from several levels: it can be devotional and you can let the Holy Spirit speak to you on that level. But when you look for the whys and wherefores, that's another level, and that level is beyond most of the people in the pew.

A student explained her belief change experience:

After going away to college and learning about the digs they have gone on and all the evidence from geology and paleontology I changed my opinion on how one honestly studies the Scriptures. I guess it makes me somewhat in conflict with my family. My uncle is a fundamentalist and he says "That is or is not what the Bible says" and that is it, to him. I mean he just accepts whatever the Bible says literally, and he is a physician too. His religious education or general education, or maybe it's just because he is a different person
than I am, makes him think differently. We just can’t talk on that subject while we are together.

A young woman in the college sample stated:

To look at this differently is threatening because people think it is taking away from God, that God isn’t who he said he was. I learned all this in a geology class in college. I think they will stay so far away from taking such a class because they have to guard their beliefs, even to give up such interesting learning. I fought changing my thinking. I got very defensive and didn’t want to listen to the information. I had never questioned at that deep a level and I was not comfortable. I felt everything would be shattered, everything I had built my faith upon. It took a long time, talking and reading, and praying and listening, to not be afraid to get into that kind of thinking. I was really afraid of it.

A young Presbyterian woman expressed the alienation she continues to experience as a result of belief change in this area:

If my mother were to hear my views--I speak superficially to my parents about a subject like this. Once I started to deviate from the traditional faith I could never bring this up. It would hurt them too much. It’s become a barrier but she doesn’t even know it. I didn’t want my mother to be disappointed in me. We came from the South and she was taught this by her mother, whom we all loved. I didn’t want my mother to think I thought her mother didn’t have the truth. I have been trying to tell her slowly, but I fear she will think I am a bad person. It has caused me some resentment to have to paddle around all the time with her and not be able to just say what I believe.

A Presbyterian teacher related,

I was taught the literal story, cut and dry. But I began a search. When you are taught one way, to question made me uneasy. It may have been guilt but by now the uneasiness is gone and I feel comfortable with where I am. It took quite a few years to get to this place, though.
It is quite clear that much pain, alienation, and anger can accompany the changes associated with sacred beliefs.

**The Seminars: Creationist and Theistic Evolutionist**

The creationist seminar was well organized and packed with presentations, mostly videos and interesting lectures. The primary speaker was polished, prepared, and related well with the audience using humor and anecdotes. He demonstrated biblical knowledge and Christian commitment and gained trust as an authority quite easily. There was no opportunity at any time for public questioning. This might have been because of the large numbers present or tight time frame although the seminar included a Friday evening and Saturday into the late afternoon. The two speakers were generally available during the breaks for quick, private questions by individuals, but it was clearly a one-sided presentation. No time was devoted to informing the audience about areas of concern or acknowledging that there were unanswered questions in the creation science paradigm.

A similar format was used in a meeting several months earlier where the primary presenter was in Great Falls at a luncheon informing pastors about the seminar which would follow. There was no opportunity for questions from the audience. These strategies, where one-sided arguments are presented and the audience is given a passive role, are termed mindless strategies by Palmerino et al. (1984, p. 191).
The entrance fee for the seminar was extremely reasonable, and pastors at the initial luncheon, who were challenged to recruit for the seminar, were given free passes. A major means of fundraising was through the many books and videos which were available. All of the attendees became part of a mailing list, and they receive regular letters, pamphlets, and devotionals at no cost. The mailings always encourage donations for the cause.

The literature partially defines propagandizing as presenting one point of view with the presenter personally benefiting from the dissemination of that point of view. An educator, on the other hand, theoretically presents all sides of a question and remains neutral as to the outcome.

The presenter at the theistic evolution seminar also spoke from primarily one perspective. It was a response to the creationist viewpoint which had been given in town a month earlier. This seminar lasted approximately five hours. Forty-five minutes were provided for audience questions, and the presenter mediated lively discussion between members on both sides of the issue. He was seriously challenged by creationists present and compelled to defend himself. It must be noted that he had a much smaller group and questioning was more easily facilitated.

Creationism Belief Equals Salvation

A series of comments appeared throughout the questionnaires and interviews inferring a relationship between belief in creationism and being a
Christian or being "saved" and a corresponding relationship between not being Christian and belief in evolution. This misinformation could have originated in some creationist literature as there is a strong either/or belief presented by some authors. The Institute for Creation Research, for instance, makes a clear line between creationists who are trying to honor God and who have the truth and godless evolutionists who are responsible for the main ills in society.

This phenomenon became apparent early in the study. While data were being collected at the creationist seminar, a woman was heard to ask a young woman nearby, "What do you believe about this?" She responded, "At this point in my life, I lean toward the evolutionary position, but I am open..." Upon hearing that, the woman became visibly saddened and said, "Then you are not a Christian!" The young woman tried to explain why that could not be so, but the woman could not be persuaded, dug into her purse, and gave her a gospel tract which explained salvation.

This question was added to the interviews and many individuals, including all pastors, both creationist and theistic evolutionist, mainline or fundamentalist, clearly stated that what a person believed about origins and evolution did not at all impact their status as a Christian; that one could definitely be Christian regardless of his or her acceptance of the literal Genesis accounts on creation. The attention Martin Luther drew to Romans 1:17 (The just shall live by faith) and many other New Testament references (John 3:16, 36; Romans 10:9, 13) strongly contend that salvation comes by belief in Christ's atoning death and resurrection.
"I don’t think God is basing our salvation or how he feels about us on whether we believe creationism or not. I think it is important we believe he is the Creator," a man asserted in an interview. "We are Christians and the important thing is not how God did it but that he sent his son to die and that is where we should be concentrating."

Discussing this subject in an interview, one woman said,

If there is something you believe is wrong, then God will deal with you on it, through the Holy Spirit. I think you can have wrong beliefs and still be a Christian. I think there are some basic beliefs, like you must believe that Jesus is God, or the basic doctrines. Those are the core. Everything else isn’t so important.

Some of the comments, however, closely associated becoming Christian with becoming creationist, suggesting possible confusion: "When I became a Christian in college I came to believe that God created the world and not by evolution." "Since receiving Christ, I interpret Genesis differently." "I didn’t think about how the world was created until the Spirit brought me to faith and guided my thinking to creationism." "When I met the Lord 11 years ago, I became a creationist and integrated my faith into every aspect of my life."

Another comment, in answering what caused a belief change: "The factor which led me to change belief to creationism was accepting Christ as my Savior two years ago." Another said, "Evolution is just not a Christian view."

A man wrote on his questionnaire, "Hopefully I’ll not be judged whether I am a Christian or not by being open-minded to some 'new ideas.'" A young woman wrote, "Is my belief frowned upon? More specifically, will I end up in hell for
believing something different than creation as the beginning of the Earth?"

Another wrote, "For 27 years of my life I loved archeology and geology, but since receiving Christ, I've seen things differently."

This misunderstanding has been seen in other settings as well within the creationist milieu. Stokes (1989), referring to adults who seek to have creation science taught in the classrooms, describes some of them as thinking "the decision is important to the eternal welfare of their very souls" (p. 14). "Does it really relate to my salvation? I don’t think it does, but what if . . . ," another wrote anonymously on a questionnaire.
CHAPTER 5

SUMMARY, DISCUSSION, CONCLUSIONS, RECOMMENDATIONS, AND REFLECTIONS

Summary

Background to the Research: The Significance of the Problem

The subjects of creationism and evolution have impacted many segments of American culture throughout the 20th century. Nowhere have they affected people more than within the Christian church where many of its members have struggled to integrate the findings of modern science with their traditional faith.

Some Christians have critically examined the origin and development paradigms in which they have been acculturated and have arrived at new beliefs or have established means to defend old beliefs. "With modernization, old sources of authority, taken-for-granted norms of thought and behavior, and cultural codes . . . are subject to validity testing" (Mezirow, 1991a, p. xiii). With others, traditional sources of authority remain unchallenged as the beliefs they espouse have become cherished sources of solace and security. These established authorities are unquestionably accepted as unimpeachable. The result is that Christians have generally migrated to two poles: creationism, as defined by creation scientists, and
theistic evolution. A minority embrace other beliefs or withhold opinion on this subject.

In the minds of many, particularly within the mainline Protestant milieu, having differing views on the subjects of origins and development is not cause for concern, division, or rancor. Tolerance for variable belief is the norm in many areas within the Protestant Christian church, such as with baptism (how or when it is performed), communion (how often, who administers, or to whom it is given), varieties of worship and music, beliefs about future events, standards for ordination, philosophies pertaining to women’s leadership within the church, attitudes toward war, or strategies for mission. The standards of accepted behavior for Christians have always varied between groups and most of the differing bodies within mainline Protestantism have long recognized the freedom of others to exercise their conscience towards God.

To many, however, primarily within the more evangelical or fundamental wing of Protestantism, how one believes on the subjects of origins and development is extremely crucial and significant. Having what is determined to be inaccurate beliefs in this realm is considered to be so serious that it warrants division and subsequent loss of fellowship with other members of the Christian community. Furthermore, to some, it apparently justifies risking the loss of many professionals, particularly scientists, to the faith and the alienation of their own young people who feel torn and disloyal as they discover different belief systems.
Many young people have undergone considerable distress as they wrestle with alternative schemas.

Ordinarily, strong belief is either respected or disregarded by others, but this conflict arose because many Christians sought to impose their beliefs not only on those within the faith but on those outside of the faith as well. Many do not respect and cannot disregard these strong beliefs.

This particular problem was the base for a study on belief formation and belief change, and many of the factors which were observed to be of significance in this effort can be applied to a variety of life settings where belief is being either established or altered. Critical thinking has the potential to influence the direction and even the quality of life if it is utilized in belief formation and change. If present, it can contribute to positive belief decisions which result in significant and enriching life choices. Its absence can be seriously felt and often the result is unproductive choice with its subsequent deleterious and often permanent consequences.

Purpose

This research effort was designed to investigate the factors and dynamics associated with the bases upon which individuals formed belief, underwent belief change, or resisted change with respect to the subjects of creationism and organic evolution, or as they pondered other options. In particular, it was of interest whether the skills of critical thinking were involved in these considerations. The
present research also reflects on whether it is appropriate to utilize critical thinking in the domains of faith and religious belief or whether the data obtained in this study with respect to critical thinking can be generalized to belief decisions throughout the course of daily living.

An additional purpose was to gain insight into this subject matter in order to inform interested individuals such as pastors, parents, museum personnel, congregants, students, and educators of the multifaceted dimensions of this dilemma and to present suggestions which might help in some small way toward a partial resolution of this controversy. It is hoped that more tolerance, understanding, and inclusiveness may develop within the Christian church and that, as a consequence, others outside of that faith may see Christianity as an option to be considered and a faith to be respected and admired.

Research Plan

The research effort included not only gathering data from 261 participants but conducting an extensive literature search into four subject areas: creationism and evolution; the origin, purpose and interpretation of the Bible; critical thinking; and belief and belief change. The in-depth, four-part search provided necessary background for the comprehension of the problem, which is a requirement for its resolution.

Data was gathered on the relationships between belief and age, educational level, and level of certainty of belief. The factors which contributed to the
establishment of belief or which influenced belief change were identified and compared to belief type. The various means by which those of different beliefs on this subject matter interpreted Scripture were examined and related to belief position. The Watson-Glaser Critical Thinking Appraisal was employed, and conclusions were drawn as to the appropriateness of this instrument in an effort such as this.

As often occurs in a naturalistic study, as the research progressed some additional areas of inquiry presented themselves such as perceptions of the relationship between science and religion, the relationship between the Christian doctrine of creation and creationism, and the relationship between salvation and a particular belief on this subject. Belief as it is established in areas of life apart from religion also became of interest. In all of these areas, the apparent presence or absence of critical thinking was noted.

Questionnaires were administered to four groups of Christians. Participants at a city-wide creationist seminar and attendees at a church hall seminar which presented the theistic evolutionary view were included. A third group was a random sample of a 750 member mainline church, and the fourth group included students from a Catholic, liberal arts college paleontology class. Of the 261 individuals who completed questionnaires, 70 (37%) were interviewed in depth. Those interviewed were chosen primarily because they had indicated on their questionnaires that they had undergone belief change on this subject. Forty-
two of those interviewed (60%) were given the Watson-Glaser Critical Thinking Appraisal.

Findings

Determinants significant to belief basis.

1. The means by which individuals interpreted the Scriptures, whether figuratively or literally, and whether they viewed them as fallible or infallible.

2. The groups with whom they associated, which taught and affirmed a particular stand.

3. The authorities whom individuals heeded.

4. Acculturation, especially whether the individual had been encouraged to think autonomously and given the freedom to doubt, search, and question.

5. The level of education, particularly exposure to college.

6. The degree to which critical thinking was employed in establishing the basis for scriptural interpretation, deciding with what groups to be identified, or choosing which persons would be acknowledged and chosen as authorities.

7. The individual’s threshold for living comfortably with doubt, ambiguity, or tentativeness or, on the other side, his or her own spiritual or psychological need for absolutes.
8. The overwhelming significance given to belief within the Christian culture, with less emphasis on the actions expressed by a faith arising from a spiritually transformed life.

9. The influence of books, videos, seminars, and curricula pertaining to the subjects of creation science, evolutionary science, and the Bible.

**Determinants which influenced belief change.**

1. Increased education and subsequent exposure to new data and alternative ways to think about the data.

2. A religious conversion experience.

3. Exposure to new authority figures.

4. Whether or not critical thinking skills such as autonomous thinking, fair-mindedness, open-mindedness, justification, intellectual curiosity, and intellectual integrity and perseverance were utilized.

5. Personal qualities such as confidence, self-esteem, and courage which enabled individuals to entertain new schemas, allow transformative learning, and experience a new acculturation.

6. The group, family, or authority figures which encouraged questions and permitted skepticism.

7. Interpretation of the Scriptures, whether figuratively or literally.
8. Bible study, either study from a literalist position which encouraged change to creationism or study of a more figurative interpretation which resulted in a theistic evolutionary position.

9. Exposure to higher criticism in the area of biblical scholarship.

Determinants which prevented belief change.

1. Lack of higher order thinking which resulted in close-mindedness, lack of intellectual courage, fallacious reasoning, premature closure, oversimplification, distortion, or an unwillingness to consider contrary data; lack of autonomous thinking.

2. Reliance on "inherited" or inadvertent rather than "chosen" authority figures.

3. The powerful influence of the group which discouraged independent thinking.

4. The personal need for absolutes and the inability to tolerate doubt or uncertainty in this area; the comfort of the known.

5. Less formal education.

6. A strong acculturation into an authoritarian religious environment which elevated tradition and convention.

7. Allegiance to a literal interpretation of the Genesis accounts of creation.
Watson-Glaser Critical Thinking Appraisal

The data of this research showed no appreciable relationship between critical thinking scores on the Watson-Glaser Critical Thinking Appraisal and beliefs on the subjects of creationism and organic evolution. Several individuals expressed astute, rational, and discerning comments, yet their performance on the appraisal was weak. Others achieved good to even high scores on the appraisal, yet in conversation revealed close-mindedness, intolerance, and an unwillingness to consider alternative evidence. Their beliefs did not result from autonomous thinking but appeared to have come after exposure to and indoctrination by authority figures, many of whom were no doubt well trained in theology but were not experts in science. Critical thinking skills did not carry over into at least this aspect of the spiritual realm of their lives. These observations support McPeck (1981), who states that the transfer of critical thinking skills cannot be assumed. It also may relate to the fact that this subject is not just an intellectual subject but is one which seriously impacts the affective domain. The "sense of having a mission or mandate from God has discouraged self-reflective questioning. At times it has generated arrogant self-delusion" (Paul, 1993, p. 40).

Many individuals, especially those from the theistic evolutionist position, proved to be quite accomplished critical thinkers, as attested by their Watson-Glaser Critical Thinking Appraisal scores, but more particularly by their
thoughtful and lucid comments herein recorded. However, no trends could be clearly and generally seen relating appraisal scores with expressed critical thinking skills.

**Critical Thinking**

This research attests to a lack of autonomous thinking among many Christians on the subjects of creationism and organic evolution and a deficiency of many critical thinking qualities such as open-mindedness, fairness, intellectual honesty, and the ability to reserve judgment, especially by those of creationist belief. The fear to confront evidence contrary to present belief was noted, and an elementary understanding of biblical interpretation was quite common. Errors in reasoning, vague and inaccurate statements, lack of justification, and denial of contradictions was observed. Resistance to critical thinking was demonstrated. "At every step along the way, however, polished, satiny voices will tempt us astray with slick, simplistic messages that appear to guide us back to the 'tried and true'" (Paul, 1993, p. 4).

For many other Christians, however, higher order thinking was amply expressed. Many showed intellectual courage, being willing to risk change and be proven wrong. They risked alienation and loss of group identity for what they felt was right, based on reason. They revealed open-mindedness, fairness, and perseverance as they struggled, some for many years. They were willing to live
with uncertainty and were open to doubt. They questioned and chose new authorities based on valid grounds.

Belief and Belief Change

This research revealed that individuals who had been solidly acculturated into an authoritarian religious environment which held a literal interpretation of the Scriptures and viewed them as the infallible, very words of God resisted belief change to the theistic evolutionist paradigm. A belief change as profound as that would have required a total hermeneutic reorientation or, if in another area of life, a whole readjustment of thinking, values, or basic premises.

Defenses were established to avoid being exposed to alternative views of Scripture interpretation or to becoming acquainted with the scientific basis for the evolutionary position. Many were not willing to consider listening to Christians who were evolutionists. Some who were agreeable expressed a defensive stance saying they would not be open to change. Fear was definitely a factor in such avoidance behavior. Change in any area requires new support systems, new authorities, and the unknown always looms. This inevitably brings apprehension.

The mind is instinctively designed for habit, associating 'peace of mind' with routine. The mind's natural inclination is to reduce the new to the old, the complex to the simple, and everything as much as possible to familiar, well-grooved patterns and habits. It is not natural for the human mind to continuously re-think its systems, its routines, its habits -- in fact it is downright threatening. (Paul, 1993, p. xi)
Kennedy (1991) speaks to how difficult it is for individuals to change, yet notes it can begin to occur when they are able to objectively assess the factors which have influence upon their lives:

The inertia of the powerful macrostructure and the momentum of the enculturating process upon each person appear to be givens. These givens are accepted and internalized as are the various assumptions making up the whole. Yet, as persons experience other perspectives or sense contradictions within the accepted framework, they often wonder about and question the givens they receive. (p. 100)

Some participants in this study had not pursued education beyond the high school level and had not had the opportunity to become familiar with alternative belief positions on either biblical interpretation or origins and development. They were strongly supported in their churches by a committed group of cohorts holding homogeneous beliefs, where autonomous thinking would not have been encouraged. Kennedy (1991) states, "Each person therefore is located in a matrix of personal and group self-identity and self-interest. The ideology of that matrix shapes the way that person views the world and all social relationships" (p. 99). The group had been persuaded and was convinced that evolutionary theory was evil, the work of the devil, and that it should be eschewed as well as all those who espoused it. Participants who were members of the group therefore resisted learning about evolutionary theory and were not willing to give equal time and consideration to that viewpoint.

Moreover, even individuals with formal education at the graduate level and who, without doubt, employed critical thinking in their secular lives, were content
to allow religious authorities to think for them. Many of their authorities had not
been carefully chosen, nor did it appear to bother or occur to them that those
trained for the pastorate were not necessarily credentialed in science.

Belief change was generally seen to be extremely unsettling, especially for
those who changed from the creationist position to the theistic evolution paradigm.
It often required new group affiliation, was accompanied by conflict, and brought
the risk that one’s own faith foundation might be shaken. For some it took many
years. Meyers (1986) explains that,

- One reason that reconstructing thinking processes can be painful is
  that structures of thought are not merely matters of dispassionate
  cognition. They are highly personal and emotional, involving
  cherished values and beliefs. (p. 14)

The literature confirms that change is generally resisted, and when it occurs
it is usually stressful, and belief change in an area that is personal and sacred can
particularly bring anxiety. Emotions such as guilt, anger, and disappointment were
felt by participants in the study, and disillusionment and estrangement from family
and church community were sometimes experienced when belief change occurred.
Some feared the consequences of change and hid their belief status, thus
constraining them to live perpetually in a world of caution and hypocrisy.

The data showed that for some participants belief change was accompanied
by serious resentment towards their church upbringing which indoctrinated them
into a literal interpretation that could not withstand the onslaughts of modern
scholarship and thus forced them into the difficult arena of belief change. For
others it was disappointment as they realized that the people whom they had trusted as strong Christian models were uninformed and naive in this particular area. Most, but not all, were forgiving.

While belief change from creationist to theistic evolutionist was difficult for most, it was effortless for a few who followed the logic painlessly. Belief change in the opposite direction, from the evolutionist position to that of creationism, was conspicuously not upsetting. None of the creationists who had undergone a belief change from the evolutionary paradigm expressed that it was difficult, distressing, or took a long time. Some felt it was God’s leading, and they followed. Some felt it was a joyful experience.

Several who participated in this project moved to a creationist view from a theistic evolutionist view after being exposed to books, various media presentations, Bible studies, or persuasive and propagandistic lectures. The most common factor, however, which contributed to belief change in the direction of creationism was a conversion experience. It is not uncommon for belief change to occur in other life settings with parallel conversion experiences. When a new authority enters, when one becomes aware of previously unknown information or insight which sheds important light on a subject, or when one has a personal experience which alters one’s perspective on an issue such as crime, war, or welfare or on a person, conversion occurs which can lead to belief change. New insight engenders modification of belief in all areas of life.
The main factors which influenced belief from creationism to theistic evolution was education. Once the scientific evidence for the evolutionary paradigm was understood, and especially if individuals were knowledgeable about hermeneutics and a more figurative means of Scripture interpretation, they embarked on belief modification which often entailed a lengthy and stormy journey.

This study revealed that for some participants belief change was slow, requiring many years, even decades, and was extremely unsettling. Gillespie (1979) confirms that long and often anguished battles with facts and theories precede most shifts in allegiance (p. 154).

Relationship between Faith and Belief

It became apparent in this research that belief, as defined by Smith (1979), is more important than faith, as defined by Smith, Tillich (1957), and Bultmann (Johnson, 1987), to many modern Christians. Belief, says Smith, is the holding of certain ideas, an activity of the mind. Faith, on the other hand is deeper, richer, more personal, a total response, to act in terms of a transcendent dimension (p. 12). Tillich defines faith as participation in one’s ultimate concern with one’s whole being (p. 32), and Bultmann believes faith is an abandonment of one’s security, to find it in God (p. 303).

It appears that in the culture of modern Christianity, individuals are judged more on the basis of what they believe rather than by how they love or serve, or
how they "faith." Belief in evolution has relegated individuals, colleges, and whole
denominations to black lists, regardless of their faith commitment. When beliefs
have not conformed to a preconceived set of agreed-upon statements stereotypic
labeling, divisiveness, ostracism, alienation, and guilt have resulted. Faith
expression, even of the most Christ-like qualities, has been apparently deemed
irrelevant if belief is not totally in order. Therefore, many who leaned toward
evolutionary theory were not free to admit it within their church milieu, to their
pastor or friends, and they have lived in a state of caution, bondage, and hypocrisy.
One's faith level has no parallel penalties.

Doubt

  Creationists were found to entertain fewer doubts about their beliefs on
origins and development and expressed more assurance, whereas theistic
evolutionists and those who were undecided had more questions, were more
tentative, and admitted to the possession of many doubts and uncertainties. They
appeared to tolerate ambiguity with some ease, even expressing a preference for
living in the dynamic world of possibilities, compared to a static world view of
absolutes.

  Mooney (1991) explains why scientists inevitably live with uncertainty and
tentativeness in the realm of the physical world which would include origins and
development:

    Today most scientists are more modest in their truth claims about
the physical world. Their goal is no longer certain knowledge but
only verisimilitude, a slow but progressively more accurate understanding, a gradual tightening of their grip on a reality that they have come to realize will always elude them in its totality. They still seek the truth about nature, but now they are fully aware that what they seek is often selected to accord with their presuppositions and prejudices. (p. 298)

For these same reasons, others who look at scientific data resign themselves to a world of uncertainty, yet possess a ready optimism to receive the truths as they unfold.

**Influence of Education**

It was found that support for the creation scientists appeared to be mainly among Christians with less formal education, yet many with college degrees or graduate experience also relied on creationist authorities unquestioningly, trusting that their convictions were grounded in revealed truth and their interpretations faultless. This glaring lack of critical thinking among the more educated gives cause for concern.

The determining factor which led creationists to a position sympathetic with theistic evolution was education. Many of those interviewed, when asked the circumstances of their belief change, began their answers with, "When I went away to college ..." They found the cognitive dimension could not be denied even though the affective domain often resisted change.

Exposure to scientific evidence and gaining an understanding of the rationale which undergirds evolutionary theory regularly resulted in belief change. Learning critical thinking skills and being exposed to new ideas, data, and world
views also impacted belief. The scholarly discipline of hermeneutics, or biblical interpretation, which presented the option of figurative interpretation, also facilitated some individuals’ belief change from creationism to theistic evolution.

Generally, the greater the amount of education, the more likely a person was to believe in evolution. This supports the data of Lord and Marino (1993) who found that 60% of college freshmen and sophomores believed in evolution while 80% of juniors and seniors did (pp. 353-357). Sheler (1991) reports a Gallup Poll which found that 65% of Americans who had no high school diploma believed in creationism while only 25% of those with a college degree held that position. Theistic evolution is believed by 23% of those with no high school diploma but 54% of those with a college degree hold this position (p. 59). College appears to be the primary place where evolutionary belief is interpreted and established. Education is a primary consideration in this question of origins, development, belief change, and critical thinking.

Knowledge and Perception of Science

The literature expressed and the present research confirmed that in 20th century American culture there is a serious deficiency in many individuals’ understanding of what science is. Its limitations were not clear nor its strengths always appreciated, and many did not understand that it is tentative, progressive, and exists to be disproved. This was particularly seen in those participants whose education terminated at the high school level. Some assumed science could speak
to the presence or absence of a creator, claiming that evolutionist belief was atheistic belief. The qualities of falsifiability, objectivity, and repeatability in science were not understood nor was the role of peer review within its domain. Many did not see that corroborating data from diverse scientific disciplines represented powerful evidence which, if intellectual honesty were present, should not be ignored. Many were uninformed as to what scientists mean by a theory or how science works, how it of necessity affects the belief schemas of many people, and how it can be integrated into the world of one’s faith.

There was a distrust expressed for science and its findings by some Christians, primarily those of creationist persuasion. Some individuals in the interviews communicated suspicions that scientists, in concert with the general culture, had a conspiratorial agenda, attempting to persuade all to a godless belief in a universe without design and against biblical belief. Some comments suggested that standing firm against scientific data and the misguided scientists who supported evolutionary theory was reflective of great commitment and deep faith.

Many theistic evolutionists and some from the undecided category felt their lives and faith were generally enhanced by the fruits of modern science. They conceded that the increased materialism which has resulted from scientific advancement can be a strong competitor for people’s time and attention which might alternatively be spent edifying the church and deepening their spiritual lives.
Numerous participants in this study were unfamiliar with the original setting, purpose, and development of the Bible, and while they may have been aware that it consisted of many literary forms, they did not appreciate that considerable skill and training were required in order to arrive at correct interpretations of these varied forms. The discipline of higher criticism was unknown to many and avoided by others.

On the other hand, many participants employed both figurative and literal means of biblical interpretation depending upon the type of literature, whether history, parable, myth, proverb, hymn, or prophesy. They were quite informed in hermeneutics and applied their understanding as would be expected of accomplished critical thinkers. Many saw Genesis 1 and 2 as myth, incorporating several profound theological statements.

The Bible was written by numerous authors in another culture, thousands of years ago in a prescientific age. It was viewed by many participants as a book which could be read without any background, and interpreted arbitrarily in a literal manner. Its tremendous literary diversity and uniqueness were not considered as interpretive philosophies were chosen. While it was ascertained that many pastors were well informed in this area, numerous lay people saw the Bible as an infallible, magical book which, while written in a pre-scientific era, could be read as an authoritative science book. Its authority was unquestioned, its weaknesses
overlooked or remarkably explained away, and any attempt by others to question it was regarded as bordering on heresy.

Scholars and commentaries almost universally maintain that the Bible is a very challenging book to read, requiring a disciplined mind as well as deep spiritual insight to be correctly interpreted. Christianity embraces many very profound doctrines which challenge even the most dedicated and devout scholars.

There was a strong association between type of biblical interpretation and belief in creationism or theistic evolution. Those who held to a literal interpretation were practically all creationists, and those who were receptive to a more figurative interpretation tended to maintain the theistic evolutionist paradigm. Any attempt to understand the dilemma of belief as it relates to creationism and evolution must include the testimony of hermeneutics.

Relationship between Belief and Salvation

It was found that some creationists equated their beliefs in creation and a young Earth with salvation, suggesting that if one were not a creationist, one would not be a Christian. Fear was expressed on the part of a few theistic evolutionists who hoped their stand would not impact their status as Christians. The literature from the creationist perspective does not support this thesis although confusion could arise in people's minds because of their strong "either/or" mentality which avers that creationism is truth, and evolution is false and evil. It echoes Van Till's (1987) assertion that in the minds of a large number of Christians the concept of
evolution and big-bang cosmology is inseparably linked to the atheistic world view of naturalism (p. 14), thus suggesting that if one is Christian, one is a creationist. This fallacious thinking inevitably impacts on the openness some Christians have in even considering evolutionary theory, fearing their salvation may be at risk. It can lead to unnecessary concern on the part of theistic evolutionists, such as some in the research sample who, because of their unfamiliarity with the basic doctrines of the faith, entertained apprehension about the state of their salvation.

This same conclusion must have been noted by others and brought to the attention of the leadership of the creationist movement, for J. D. Morris (1995) of the Institute for Creation Research felt compelled to clarify this point as follows:

Some have suggested that ICR teaches that belief in the young earth is necessary for salvation. This is not the case! Salvation does not imply perfect understanding of doctrine, for then no one could be saved. God grants salvation when one repents of his sin and asks for forgiveness based on Christ's death for his sin. A sinner doesn't have to know anything about the age of the earth. (p. d)

The Option of Theistic Evolution

This research revealed that many Christians were not aware of the belief option of theistic evolution. Christians were generally told of two possibilities, creationism and evolution, and the latter was equated without explanation to evolutionary naturalism. They concluded, incorrectly, that all evolutionists believed in chance and therefore also asserted there was no creator designer. A feeling of liberation was expressed by those who understood this alternative option
which permitted them to retain their strong belief in a creator God, yet gave them license to at least consider objectively the data of evolutionary theory.

The either/or mentality (Gish, quoted by Sheler, 1991, p. 59), with no room for the third position of theistic evolution, is a confining mentality. Critical thinkers guard against limiting options, always being open to new means by which alternative paradigms may be considered. With this additional option not available to them, Christians were left with either a creationist view or an evolutionary naturalism perspective, and all would understandably deny the latter atheistic thesis. The only viable alternative, when limited to these two choices, was the creationist view, and all Christians would be obliged to align themselves with this position.

The confusion many creationists experienced in assuming that a belief in evolution presupposed the absence of a creator prevented them from even considering the option of theistic evolution. Their belief in a creator God was so strong and grounded that a crisis of faith would ensue if the evolutionary premise, as they mistakenly understood it, were considered and seen as reasonable; thus the strong resistance to even exposing oneself to evolutionary thought, let alone being open to giving it consideration.

The Organized Creationist Movement

It was noted that a strong, well organized, anti-evolution community has become established within the Christian world. Followers of creationist dogma
have been attracted by polished, persuasive, and even propagandizing means, which utilized a variety of media. Christians have been targeted in their churches, at home through radio, books, and videos, and through large, city-wide seminars. Moore (1993) states that "the creationist cosmos of Protestant fundamentalism has acquired an authority rivaling that of the established sciences" (p. 46). Marty and Appleby (1993) quote Moore, saying the creationist movement is a "well-heeled popular movement using advanced technologies--film, television, video, computerized direct-mail promotions--to commend its cosmos as genuine science to a culture still largely impressed with claims to scientificity" (p. 6). Moore (1993) concludes that since mainstream biblical scholarship and academic science lack the characteristics of innovative management, charismatic leadership, and sophisticated promotional techniques, they have suffered in the eyes of the American churchgoing public (p. 46). Most of the materials produced by the creationists consistently avoid the unanswered questions, inconsistencies, and contrary viewpoints associated with the creation science paradigm. Only well informed and astute laity can perceive this. This powerful and visible movement provides a strong support base which is required for belief change, just as a political party provides support, camaraderie, social acceptance and affirmation to its members.

Creation science leadership appeared to propagandize in their well organized, large seminar presentation, presenting only one side of the story, and insisting on a passive, captive audience. No opportunity for public interchange or
questioning was provided at the seminar. In Great Falls the seminar convener made reference to the large assembly of grade school children they had spoken to that morning, exclaiming, "We indoctrinated them all!" While this was intended as a light and humorous comment, there was perhaps more than a shred of truth communicated in that proclamation. Freire (1973) states, "The mark of a successful educator is not skill in persuasion—which is an insidious form of propaganda—but the ability to dialogue with educatees in a mode of reciprocity" (p. xiii). Educators present all sides of a problem and remain themselves neutral to the outcome. Propagandists present just one side of a question, attempting to persuade to that particular position, and they tend to benefit personally if the persuasion is successful. Those holding opposing views were denigrated at the seminar, being referred to regularly as "secular humanists" and portrayed as being a part of Satan's work, people to be avoided. To sincere fundamentalists who were committed, this controversy was part of the battle against the powers of evil, and they were ready to fight.

In contrast to creationist writers, it was found that many evolutionary writers, as scientists, exposed the weaknesses and perplexities of evolutionary theory, and these statements of uncertainty were often quoted by creationist authors and subsequently interpreted as weakness by the lay readership who were not acquainted with the powerful supporting evidence for evolution. This deception infuriated the scientists who were quoted out of context, and this practice has resulted in the alienation of some of them from the Christian religion.
Many of these methods have been employed in other areas of life where indoctrination, persuasion, and coercion occur. It is not uncommon for editors, advertisers, politicians or others to modify facts, misquote, delete important information, manipulate statistics, or in other ways inaccurately inform.

While creationists were well organized, it was observed that theistic evolutionists were not. Therefore, only one side of this question is being presented to the churchgoing public. The National Center for Science Education, Inc. exists to counter creationist activity as it impacts the public arena, but there is no parallel movement organized within the church. The several societies within primarily seminary and university settings speak to these issues but they do not have direct influence on the normal churchgoer.

**Creationism and the Christian Doctrine of Creation**

A very common misunderstanding was found among a majority of creationists in the study relating to the difference between a belief in the doctrine of creation which holds that a creator God was responsible for the creation of the universe and all that is therein, and creationism which affirms that also but adds that the creator God accomplished that creative activity in six 24-hour days, approximately 10,000 years ago. The doctrine of creation generally is believed to make no strong claims as to how the creation came into being, and it is therefore possible to integrate theistic evolutionary belief into that doctrine.
Conclusions

Watson-Glaser Critical Thinking Appraisal

The results of this research suggest that the Watson-Glaser Critical Thinking Appraisal was not the appropriate tool for assessing critical thinking skills in the specific population of adults which were involved in this particular study. It may be that the appraisal results were inconclusive because of the distinctive nature of this subject matter. Critical thinking may not be applicable in a domain which has so many emotional and spiritual dimensions. For some, the subject of this research left little room for empirical, rational thinking. They may have attained skill in critical thinking as attested to by their appraisal scores, yet could not exhibit those skills in matters of faith.

It would follow that how one thought in a secular world, where rationality and empiricism dominated, might be different than how one thought in the world of the sacred where revelation, transcendence, and faith reigned. Feelings and faith can sometimes dominate in the domain of the spiritual, overpowering the influence of intellectual and cognitive components. Some would describe this as heart over mind. Minimal transference of critical thinking skills appeared to occur in some participants from secular disciplines to the religious. Engineers or physicians may have employed refined higher order thinking in their respective occupations, yet they may not have applied them to their faith. Possibly this was because of the way in which Christianity has been acculturated in this country, at
least within some groups, where feelings associated with spirituality and other emotions are freely expressed and the intellectual domain is de-emphasized. Authority figures interpret and dictate belief and in some areas strongly indoctrinate, and autonomous thinking is not required or encouraged. People are affirmed in expressing the affective domain but the cognitive may inadvertently be suppressed.

In addition, the Watson-Glaser Critical Thinking Appraisal appeared to be designed more for young adults, high school through college. The assessment of more mature adults may involve more variables, more real world problems, and may not generalize to all ages, especially as people become elderly.

The suggestion by some authors that this appraisal might be more of an IQ test than a critical thinking appraisal may be a valid observation, particularly for adults. Several adults in the study were obviously intimidated by the appraisal, hardly understanding the directions. Yet some of these same adults exhibited qualities of critical thinking, particularly in their intellectual humility, open-mindedness, and ability to put things into perspective. These qualities may have arisen from the wisdom and perception born of life experience, which may be untestable by this particular instrument.

Critical Thinking

Many educators attest to the fact that critical thinking is not generally taught in the classrooms of this country. Historically, education has been
authoritarian, and rote memory has been rewarded. While some progress is
definitely being made, it will take years for the results to be manifest in the
population at large. The findings in this research tend to confirm the thesis that
Americans are not well equipped with critical thinking skills, and that the
institutions of this democratic society are not providing the citizens with the proper
tools to manipulate in that society. It could also be concluded that critical thinking
is not particularly encouraged in the area of belief, especially in the more
authoritarian church settings, and, because of the highly emotional and
transcendent nature of the sacred, perhaps critical thinking will never be purely
manifest in the world of religion. The strong group ties within many Christian
churches where members share homogeneous belief also do not encourage
original thought. If one is tempted to question or challenge, the penalty can be
exclusion, a serious consideration.

Another conclusion which can be drawn which helps to explain the lack of
higher order thinking in the field of biblical interpretation, creationism, and
evolution is that many Christians have not availed themselves of the opportunities
to become more mature and sophisticated in their theological thinking. Ample
Christian education opportunities are usually available in most churches and
literature abounds on these subjects. If Christians are still at the faith stage where
they were as children or even as young adults, they have not progressed. It may be
indicative of indifference, laziness, or a lukewarm faith which has caused them to
settle into an elementary faith plateau. Church leadership should not always take
full responsibility or blame for the maturity level of each Christian's faith. This also occurs in the secular world where countless opportunities may be available for citizens to increase learning and thinking skills, but they do not avail themselves of these options. It can be concluded that individuals are partially responsible for certain deficiencies which are manifest in their thinking and that educators, pastors, and institutions are not wholly to blame.

**Belief Change**

Belief change in the areas of creationism and theistic evolution was seen to impact psychological, emotional, spiritual, and even social domains and oftentimes required a lengthy time period and considerable support to achieve. This was especially true for those who changed from the creationist position to the theistic evolutionist paradigm. This confirms Seaford (1990) who found that individuals who were faced with the data of science and who had been raised on a literal biblical interpretation experienced fear and discomfort as they faced adapting to a new belief (p. 163). Most belief change from the evolutionist perspective to the creationist occurred as a result of a conversion experience, either contemporaneously or in the months or years which followed. It can be concluded that the fundamentalist churches have been successful in their indoctrination of the new convert into the creationist, literalist model. This has been accomplished through use of plentiful resources such as books, videos, and seminars as well as through the strong support group of a closely knit church. Christian education
offerings and sermons emphasizing these subjects also has contributed to this success.

The same dynamics operate in other areas of life where strong acculturation by respected authority figures has resulted in firmly established belief and much effort and determination is required to dislodge parts of those belief systems. When highly personal and cherished beliefs are established such as a traditional family political perspective, a strong opinion on some social issue, an ingrained prejudice, or conclusion drawn from a significant life experience, time and attention are required for any modification to occur. Many people perceive their own identity as being democrat, liberal, elite, or anti-gay. Belief change can entail reformulation of one’s self image, a major adjustment.

It is not always recognized that some belief patterns can be mere habits or routines and some merely convenient, having served well in explaining phenomena in the past. It can be concluded that these patterns and beliefs have in some cases been elevated to the status of sacred doctrine merely out of longstanding use and because they have become comfortable, and because no one has questioned them. When they are brought under scrutiny, they are defended earnestly not because of their innate value necessarily but because of an assumed value or out of resistance to the new, which brings the unknown, which in turn brings stress.

It might be concluded that the ease of the belief change experiences of those who went from the theistic evolutionist paradigm to creationism was attributable to the strong support and affirmation they received within their church
setting or, as some inferred, it was guidance by God and they willingly were led. Individuals crave acceptance and the sustaining affirmation of the group provided that. For others, it may have brought a certainty which is welcomed by the human spirit which generally possesses an intolerance for ambiguity. Some expressed the peace and relief they felt when it was settled. Being assured that one’s beliefs are correct eases the stress of belief change and can even make it pleasurable.

On the other hand, the stress endured by those who changed from creationism to theistic evolution is not surprising. As Palmerino, Langer, and McGillis (1984) observe, individuals are students of life, and when they extend themselves, explore, and take risks, they can bring about dissonance as well as discovery (p. 6). It can be concluded that while change is difficult in many areas, such as in interpersonal relations, educational settings, career modifications, or allegiances, it is particularly stressful in the arena of religion, as major foundations of the faith can be shaken. The penalty is alienation and disequilibrium, and the results can bring doubt, confusion, and disillusionment.

Belief change from creationism to theistic evolution primarily resulted from increased learning which came through exposure to scientific evidence and an understanding of the rationale which undergirds evolutionary theory. The discipline of biblical criticism, taught within the church milieu, also contributed to some individuals’ belief change. It was obvious that education in science classes influenced belief in the areas of creationism and organic evolution, and education in the church influenced the type of biblical interpretation. Both of these
educational experiences impinged on final belief on the subjects of creationism and theistic evolution and support the conclusion that education is fundamental to any belief modification.

It could be concluded that the mainline churches, because of their more figurative approach to the Scriptures, provided more leeway in biblical interpretation, thus freeing their members to study and choose. It also appears that biblical interpretation is the key factor in establishing belief in creationism or evolution. Mainline Christianity has not elevated belief in origins and development to levels of great importance, so belief change, if it occurs, is not so momentous. It can occur naturally, gradually, and even painlessly, as individuals gain knowledge in many areas throughout their lifespan.

Faith and Belief

Belief has, in the 20th century, become of supreme importance to Christians, far surpassing the sacrificial action of faith that seems to be taught by New Testament writers, including Jesus himself. Belief becomes the standard for inclusiveness, acceptance, and the basis for judging one’s Christian depth and genuineness. This helps explain why evolutionary belief is so anathema to many Christians. Exposing evolutionary leanings would risk erecting barriers which some Christians could not overcome. Action commitment takes second place to belief in assessing spirituality. This mentality absolves Christians somewhat from the responsibility of living their faith as long as their beliefs are in order. Belief
becomes so critical that stereotypic labelling, a type of name calling, and intolerance, exclusiveness, and judgmentalism seem justified in the minds of some.

It can be concluded that resistance to this change is especially strong because of the importance belief has been given in this culture. The literature reports change to be universally resisted, but when there are so many additional factors involved, it follows that it would be resisted even more. Christians would be reticent to admit that their former authorities, whom they continue to love and respect, would have had inaccurate data and be grossly misinformed. In addition, they would resist the inevitable alienation and conflict which could distance them from friends and family. Individuals in the midst of belief change needed to work through which parts of their theology they could retain as they replaced some parts. This took much effort, often interfering with normal life activities such as coursework, if one was in college. Some interviewees testified that they were tempted to throw out all of their faith, and some refrained from attending church for long periods of time as they experienced this bewilderment. One might conclude that this unpleasantness could be alleviated if institutions such as the church affirmed change and encouraged reflective thinking. Doubts arose which were extremely disruptive and distressing and they even put basic faith at risk. These factors partially explain why belief change from creationism to theistic evolution was painful. An obvious conclusion is that if all Christians were informed of the theistic evolutionary option, this conflict might not be as pervasive or as divisive, and belief change might be smoother.
The weakness of science education was exposed in this study and the obvious conclusion was a need for more attention to the philosophy of science as well as evolutionary foundations, especially on the high school level. The highly emotional and conflict-ridden aspects of this subject matter discourage this, however, and therefore there is pessimism among some that this can be changed. It must also be concluded that increased training in critical thinking skills would alleviate much of the difficulty in establishing or realigning belief in any area of life.

Science educators admitted that science teaching has been woefully inadequate to prepare a population which lives in a science-based, technologically complex world. The failure of participants in this study to comprehend what the boundaries were of the scientific method, what it could and could not do, can be explained, at least in part, by weak science education, particularly on the high school level.

Many Americans who have terminated their formal education at high school never were adequately informed about evolutionary theory. Two high school biology teachers in the research population attested to de-emphasizing units on evolution, one out of a time crunch and the other because she preferred to avoid the potential controversies which might ensue. In addition, the literature suggests that there is not the time nor do high school students have the background to sufficiently examine the complex aspects of evolutionary theory. Also, because
of creationist activity in the past, publishers have responded in recent decades by devoting less and less space to evolution in the biology textbooks. As a result, very few Americans who have not studied beyond high school can be expected to be well informed about the many pros and cons of evolutionary theory. Some have been taught one side of the issue well in church but did not learn the other side in school or in church. Their instructors have been primarily pastors or Bible teachers, not scientists, and in many cases their education has not included a thorough and unbiased grounding in the scientific dimensions of this dilemma. These two factors, less available information, and a de-emphasis of the material, have had a serious impact on the general population, resulting in their being ignorant of a substantial body of information which bears a significant influence on the culture.

College students are confronted with evolutionary theory quite soon in freshman biology, geology, or anthropology classes and they are introduced to the substantiating data. Most do not perceive science professors as trying to fulfill an evil agenda. Some even see science faculty as committed Christians who have embraced evolutionary theory with some ease. This gives a new perspective to the generic godless evolutionary scientists about whom they have heard. These trigger experiences force the recognition of contradictions. Students appraise, explore, and often adopt alternative perspectives (Brookfield, 1987, pp. 26-27). It is therefore not surprising that most theistic evolutionists have had some university training since this is the main place where evolution is presented in depth.
Biblical Interpretation

Historically, fundamentalist Christians have not been sympathetic to the discipline of biblical criticism, and they have not endorsed the scholarship which has arisen from that field of academic endeavor. The authority figures of the past decades, in many parts of Christendom, have preached and taught that the only way the Scriptures can be interpreted is literally and infallibly. Particularly, they have applied this thesis to Genesis 1. The fear of the unknown, commitment to the traditional faith of the fathers, and the assumption that higher criticism is a trend towards liberal "modernism," as well as the unspoken threat that it may dictate change or shake the belief in biblical inerrancy has prevented many Christians from even considering another means of biblical interpretation. Some even felt that the Bible should be exempt from critical scrutiny, being in a literary class by itself. Suggesting that the Bible may have textual problems may divulge a lack of faith and even border on heresy.

Many lay people in the study were not aware of the scholarly support for a more figurative interpretation of the Scriptures. Lack of questioning and openness to other views also has precluded them from seeing the many inconsistencies associated with the literal view. Strong group censure discouraged even the exploration of alternative interpretive paradigms. The admitted failure on the part of pastors and other church leaders in providing adequate training in biblical interpretation to lay people relegated many of them to a level of interpretation far below their intellectual capacity and spiritual need. Many of the Christians
interviewed tenaciously held to the literal viewpoint, convinced they should build their world view on that foundation. Close-mindedness and unwillingness to entertain a new model of interpretation was indicative of lower order thinking. All of these factors support the conclusion that lay people are not properly prepared or equipped to independently formulate accurate, valid belief which will meet their needs in a complex, technological, fast-paced, changing world.

Authorities

Christians’ weak grasp of evolutionary theory may also be due to the fact that authority figures within the religious realm are not qualified to speak to scientific issues. Inaccuracies, biases, misrepresentations, and distortions can be inadvertently taught. Evolutionary theory encompasses paleontology, genetics, geology, chemistry, physics, and other scientific disciplines. Few are qualified to interpret all of the data surrounding this subject. Evolutionary theory is not easy to fully understand and considerable training is required in order to speak authoritatively on all of its ramifications and implications.

These observations can be related to myriad areas of life where individuals are not trained to assess data. The importance and necessity for continual continuing education can be seen in all of life’s dimensions, and especially for those in leadership positions who become the authorities.

It also appears that among some fundamentalists there is a certain reticence to using the mind in areas such as these. Creationists quote I Corinthians 3:19
"For the wisdom of this world is foolishness with God" (King James Version), thereby justifying the glorification of ignorance to some degree and disdaining the pursuit of knowledge. Is the human mind, part of God's creation, to be negated as one strives for holiness? Many would hold that learning is, in itself, a neutral phenomenon. What one does with the learning is another question. If arrogance resulted from learning, it could be considered counterproductive or sinful, but knowledge with humility can be noble. The pursuit of knowledge which honors God can be a form of worship. This was clearly modelled by scientists in the 18th and 19th centuries.

As was seen in this research, warnings in Scripture against worldly wisdom were interpreted by some to discourage higher education or the exercise of the mind in the realm of the sacred, or the secular, for that matter. Simple faith acceptance was rewarded and encouraged. Threats were given to those who were tempted to wander into the world of biblical scholarship. Doubt and questioning were equated with weakness. It was concluded that all of these factors contributed toward diminishing the possibilities for transformative learning.

The influential creationist movement has apparently flourished as the security of absolutes has been provided for those who search and as critical thinking has been discouraged. They who perhaps condemned the world and its knowledge have used its latest technology to disseminate a packaged doctrine of creationism. By asserting that the devil is on the other side, they have succeeded in attracting the committed to their cause, especially those who respond to
authoritarian leadership. These Christians have been innocently and inadvertently persuaded, having unquestionably trusted the leadership's honesty, scholarship, and conclusions. Having been led to believe it was a religious quest, they apparently gave, supported, and wholeheartedly joined the battle. Their zeal and commitment are admirable. The people have been "maneuvered by intoxicating propaganda. They are not supposed to think. Someone else will think for them" (Freire, 1973, p. 11). They have been like children, led. They were impressed by academic credentials of those far beyond them in education and have willingly followed their leadership.

The motivation has been sincere on the part of all. To that there is no question. The agenda of the leadership is not evil. They, from the scientists' perspective, are sadly misinformed.

The Application of Belief and Belief Change Theory to All of Life

Much of the insight realized in this study on belief and belief change within the religious sphere can be transferable to life situations where individuals are called upon to consider new data and entertain the possibility of belief change. When decisions are required in the political arena, in interpersonal relationships, on the job, or even in such mundane settings as when one is about to purchase a new car or decide how to invest savings many of the same factors are operating which were seen in this study. For instance, authorities universally play a large role in helping adults make choices. In all areas of life they are relied upon to help
belief become established. No one is expert in all of the political, social, or business dimensions of life. Everyone relies on authorities, and how they are chosen can have grave consequences. The philosophy a parent chooses in childrearing can have far reaching effects on a child. The wise individual is sensitive and aware of the authorities in his or her life and constantly assesses their appropriateness using the skills of critical thinking. Are they unbiased, informed, neutral as to outcome, dogmatic, objective, careful, prejudiced? Do they have a personal agenda? Are their opinions derived after valid consideration? Teachers, authors, television personalities, friends, relatives, salespersons, physicians, attorneys, politicians, brokers, advertisers can all take on the role of authorities if an individual permits. Vigilance in this area is most prudent. Rokeach (1960) states that since each person's sphere of experience is extremely limited, each person must rely on others as authority sources. The key is to be able to discern which authority to follow (p. 43). Individuals' dependence upon authorities varies along a spectrum. At the one end only tentative reliance may be given while at the other extreme absolute, unquestioning reliance may be bestowed on an authority.

Another area where the conclusions from this study can be observed across the life experience is that of group influence on belief and belief change. This phenomenon cannot be overestimated. Not only does the group wield strong control within the religious realm, but this control can be observed in such diverse settings as fraternal organizations, political parties, university departments, classrooms, cooperatives, businesses, clubs, neighborhoods, and families. In some
of these settings it is almost impossible for the individual to think and act autonomously without fear of reprisal.

It can also be generally concluded that in all areas of life change is resisted. Rokeach states that "people often selectively avoid contact with stimuli, people, events, books, etc. that threaten the validity of their ideology or proselyte competing ideologies" (p. 48). Individuals may narrow their field of friends or selectively choose associates, colleagues, or printed materials on the basis of belief compatibility (pp. 48-49). Belief change stands a chance only if the new information is entertained and seriously assessed and factors such as unrelated habits, perceptual cues, irrational ego motives, power needs, the need for self-aggrandizement, and the need to allay anxiety prevent individuals from evaluating new information on its own merits (p. 57). Adler (1987) states, "Our conservativeness (resistance to modifying beliefs with new evidence) and confirmation bias (giving higher weight and attention to positive cases, at the expense of negative ones) are a persistent feature of human belief formation" (pp. 250-251). This can be witnessed throughout the life situation.

Additional factors which can be applied beyond the religious dimension of life and which affect belief and belief change are the following, according to McGuire (1969): the person's attention to the message, ability to comprehend the arguments and conclusions, ability to retain the arguments, general intelligence, personality, and even self-esteem (p. 243). Gordon (1971) believes that "fear—cold, naked fear—is probably at the core of our dearest beliefs" (p. 268).
Education can also be seen to have a profound influence on belief formation in every aspect of life. Education tends to open up new avenues and permit freedom of choice, and change is often affirmed in a positive educational setting. If critical thinking were taught, the more educated would be more aware of the limitations of the insight of any one person or group of persons, and they would see the value in considering new proposals or viewpoints, whether it be in childrearing, voting, purchasing a car, or even choosing a vacation rendezvous. The educated critical thinker could more effectively choose appropriate authorities as well.

The acculturation of an individual profoundly affects the belief decisions which are made in all areas of life. The diverse means in which an individual is molded by the culture cannot be quantitatively assessed, yet they are most obvious and influential. If one has been reared in an authoritarian environment where individual decisions are not encouraged, belief can tend to be established by the authorities in that particular culture. If critical thinking skills have not been modelled or taught, but dogmatism, prejudice, close-mindedness, and narrow-mindedness have, the person is strongly influenced by that culture. On the other hand, if an individual has been acculturated in another environment, other qualities would be expected. As one interviewee expressed, "My parents taught me to free think." The freedom to autonomously think will no doubt be expressed generally in his life.
Just as inaccurate perceptions have been shown to exist within the religious world, such as the confusions between creationism and the doctrine of creation, or between evolutionary theory and evolutionary naturalism, many misconceptions, misunderstandings, and falsehoods permeate all domains of life. Hearsay, old wives’ tales, conclusions based on faulty or insufficient data, half-truths, honest mistakes, ambiguities, rumors, and prestige associations are omnipresent in daily life. Knowing what and who to believe challenges belief formation or change in all areas just as has been demonstrated in the religious realm.

Subjectivity plays a large role in belief and belief change within the realm of the religious, and it is also present in founding secular belief. Meyers (1986) feels it is important to stress the role of subjective elements in critical thinking because to him critical thinking is usually identified with strictly impersonal or objective modes of analysis. He suggests that many people lump together the terms objective, critical, and cognitive when they talk about the development of thinking processes. In so doing they implicitly discredit the subjective, personal, and affective aspects of thinking (pp. 90-91). Meyers explains that "the force that stimulates and sustains critical thinking is often rooted in personal values and commitments, as well as a need to order one's experience rationally" (p. 91). He refers to philosopher and chemist Polanyi's conviction that "most scientific knowledge is the result not of an impersonal, dispassionate search for truth but, rather, of scientists' passionate, personal desire to comprehend nature and find order in the universe" (p. 91). Such subjective elements as curiosity and wonder
are primary motivations for all learning, within the religious sphere as well as in every sphere. While there was the suggestion throughout this paper that critical thinking was absolutely desired and necessary in the realm of the religious, it was also seen that critical thinking could not be used exclusively within the realm of faith. Transcendence and faith cannot be defined or understood entirely with the rational mind. There is room and must be room within religion for awe, hope, revelation, trust, and many qualities which cannot be rationally defined. Polanyi asserts that that is also true in every area of life, that there is an inseparability of subjective and objective elements in any act of knowing (p. 91).

It can be concluded, therefore, that many of the dimensions of belief and belief change theory which were observed in this research effort within the religious realm can indeed be seen and applied throughout all realms of one's life experience.

**Recommendations**

**Recommendations for Educators, Parents, Seminarians, Pastors, and Students**

There is no doubt that civilization as well as individuals will be served if the skills of critical thinking are learned and practiced. Brookfield (1991) states,

We are like psychologically shipwrecked voyagers, desperately clinging to whatever piece of psychic flotsam we can find as we are tossed in the turbulent seas of personal and social change. We seek solace for these traumas in religious cults, political dogmas, the promises of fanatical, totalitarian leaders, and drug abuse. (pp. 42-43)
How can these skills be taught? The following suggestions may help all who seek to disseminate the liberating skills of critical thinking and assist in belief change.

1. Be mindful of the influence of the group upon all individuals and the strong acculturation they have received which profoundly affects belief. Any belief change that is desired must be accompanied by a replacement support group which not only sustains an individual in a belief change but provides an alternative acculturation which is comfortable in the new setting. Brookfield (1987) states, "The process of recognizing and exploring the discrepancies between our assumptions about how things should be and the way they really are is made easier and more congenial when accomplished in the company of others" (p. 25). If the instructor assists in helping the learner locate a network which supports, evaluates, and motivates, it can make a crucial difference in the learner's success.

2. Affirm the self-worth of the learner. Be careful not to threaten or intimidate those who seek. Encourage all questions and affirm the questioner.

   There is an uneasy tightrope to be walked in developing critical thinking in others; we must balance between respecting their integrity, so that they do not resist our efforts, and ensuring that sufficiently hard and challenging questions are asked to prompt them to scrutinize habitual assumptions. (Brookfield, 1987, pp. 72-73)

3. Listen to learners and reflect on their suggestions and ideas. This enables them to see their motivations, actions, and justifications from a new perspective. It is extremely helpful to see oneself from a new perspective.

4. Stress inclusiveness and tolerance. This creates a positive environment where individuals are encouraged to change at their own pace and assured that
their acceptance is not predicated on their belief. Developing "in spite of" acceptance rather than "because of" acceptance guarantees the individual a place of security within the group in spite of belief status.

5. Reward critical thinking at every opportunity. Model higher order thinking and point out examples wherever possible.

6. Identify the benefits of quality thinking and appropriate belief change in a society, friendship, family, business, church, political party, and classroom. Communicate that how one thinks is more important than what one thinks.

7. Realize that belief change tends to be resisted throughout the life experience. In order to overcome this resistance individuals must be presented with new data in a nonthreatening setting and in an objective, nondogmatic manner. Time is no doubt required.

8. Since many beliefs are held which have not been thoroughly reflected upon, individuals with open minds can receive new data and alter present belief. Belief change is possible and something which can be expected; however, inconsequential beliefs are much easier to modify than authority or primitive beliefs, according to Rokeach (1976).

9. The extent to which new information is assimilated depends upon the degree of openness in an individual. The critical thinker will receive information and reconcile it within a belief system if it is considered valid. Since critical thinking is almost universally prerequisite to the facilitation of successful belief
change, instruction in its skills is highly recommended. Regularly evaluate the
learner's progress.

10. For change to occur, the new data must interest the recipient, and it
must also be comprehended. Any means an educator can devise which can
generate interest and aid comprehension is recommended. Novelty, as well as
importance and plausibility, contributes to belief change.

11. Since change is often stressful, it can be time consuming as the
individual integrates it into a belief system. Patience is recommended. The
instructor should alert the learner to the potential risks involved.

12. When the communicator openly states his or her desire to influence the
beliefs of an individual, it increases the effectiveness of the communication.
Honesty and forthrightness is recommended.

13. It is recommended that all sides of an issue be presented when belief
change is desired. The individual then chooses and the belief will be more stable.

14. Since "learning is change," education on any issue is always
recommended.

15. Since change is resisted, repetition is recommended and variety of
presentation aids insight.

16. Belief dies hard. Conceptual conservatism prevents belief change and
it is not uncommon for resistance to be complete and attempts to inform and
modify beliefs unsuccessful. Even the most informed and educated have
successfully resisted belief change. Perseverance coupled with resignation is a pragmatic recommendation.

17. In light of the previous recommendation, the training of children is crucial as many people referred to childhood experiences which formed their religious belief. Instruction in critical thinking, support in autonomous reflection, affirmation in their search, and role models who thrive on new ideas and possibilities can prepare the ground for minds which are open to truth and willing to respond to it.

Research Recommendations

1. Similar research in different regions of the United States including different populations of people would contribute additional insight into the complexities of belief, belief change, and critical thinking. Homogeneity of belief may be quite complete in many settings, and autonomous thinking and sincere questioning on a particular subject may be extremely limited. How prevalent are the qualities of critical thinking employed in political, business, church, educational, or social settings?

2. Additional research which would study the influence of the affective domain on belief change would be contributive. What are the factors involved when one knows change is necessary? One must want to change as well as know that change is appropriate. Does critical thinking apply to this arena?
3. It would be of value to determine how pastors, teachers, colleagues, friends, parents, or other supporters could facilitate best the belief change which many individuals undergo. Means may be identified which would alleviate some of the stress in paradigm shifts.

4. It would be of value to know how many academic institutions have programs or courses on the graduate level which teach how to integrate the disciplines of science and religion. If present, how were they established, what courses are taught, by whom, and what resources are used? Do institutions of higher learning perceive this as an important area of training for teachers, military officers, medical personnel, businessmen, and pastors in preparing them to lead in the 21st century? If they do not have such programs, are they interested in inaugurating them?

5. Research which would facilitate the application of critical thinking skills in clarifying and distinguishing education from indoctrination might assist the church as well as any other institution in stressing education over indoctrination.

6. It is recommended that current creation science research be reviewed with fairness and assessed honestly to ascertain its scientific authenticity and quality. It should be determined if claims by creation scientists of prejudice and ostracism by professional journals are founded.

7. Research might be designed to assess pastor training in seminaries and Bible schools on the subject of biblical interpretation. While hermeneutics is probably a part of each curriculum, how many institutions expose students to all of
the prevailing scholarship in this field? Is it treated without bias? Does education or indoctrination occur? Is autonomous thinking encouraged in each setting? Is there a supportive environment for those who inevitably will undergo belief modification?

8. It would be helpful for the church to know how scientists, especially those in biology, paleontology, genetics, astronomy, biochemistry, and geology perceive the conflict of creationism and evolution and how common it is that their lack of involvement with or sympathy for the Christian church stems from this particular problem. Van Till (1987) states, "One tragic consequence of the creationism/evolution debate may be the hindering of the Christian witness to the scientifically well informed of the 21st century, and it is a costly blunder by those Christians who insist on keeping it alive" (p. 14). Also, how many young people who have been raised in a Christian milieu are lost to the faith because of irreconcilable conflicts on this subject? What means can be considered to reverse this trend?

9. There is need for a manual, ecumenically written, which would target lay people, and include explanations of the following: biblical interpretation, critical thinking, science, creation science, the doctrine of creation, theistic evolution, and evolutionary naturalism. An historic overview of the conflict between creationism and organic evolution could be included. The strengths and weaknesses of all positions would be delineated. Students would be encouraged to independently choose their positions in light of unbiased data, and they would be affirmed in those decisions.
Such a tool would be nonthreatening, understandable, and objective. It would "enable adults to be aware of power relationships rooted in institutionalized ideologies which they have internalized in their psychological history. Individuals must be led to an understanding of these cultural myths and be given access to alternative meaning perspectives so they can critique their psycho-cultural assumptions" (Mezirow, 1981, p. 18).

This literature could be marketed first to pastors or other church leaders who could use it in classes or suggest it to lay people for use in their personal study. Attempts have been made at this effort, for example the Center for Faith and Science Exchange manual (1993) God and Science: Must We Choose?

**Recommendations for Integrating Evolutionary Theory into a Christian Belief System**

1. Realize first that God will always be great enough to withstand any truth revealed by his creation. He will be expanded by new truth, not negated by it. There is no need to fear new truth. The truth is, in fact, liberating.

Even the toughest faith will be worn down through contact with science unless it makes the effort to understand that it has nothing to lose in this contact but its resistance to the free examination of its truths. These truths are real, and faith does not have to sacrifice them to science; on the contrary, it should insist that science take them into account. (Gans, 1990, pp. 121-122)

2. Recognize that God has provided two records: the record in the Bible and the record in nature and the surrounding cosmos. Both records must be considered critically.
3. Remember that many composing the "opposition" are brothers and sisters in Christ. Recall Christ's prayer "that they be one." Distinguish between unity and uniformity. Seek the former and enjoy diversity.

4. Acknowledge that no one has an edge on truth. Believing that one has "arrived" and being closed to new truth shows a lack of intellectual humility. Wisdom and insight only come when new ideas can be entertained, and strength is expressed by an openness for new truths. Fear of the new is the weak position. Intellectual honesty demands that all data be given unbiased attention and change endured if necessary. It takes intellectual humility to admit "I was wrong." An insecure person will defend falsehood for fear of being exposed to the light. The greater the insecurity, the greater the defense.

5. Because all truth cannot be obtained, learning to live with uncertainty, ambiguity, doubt, and tentativeness is part of the territory. Many find it a stimulating place for growth, faith, and possibilities.

6. Use the mind God has given. Assertions gained by lazy or inaccurate reasoning do not honor God or his church. Attend to the development of the mind to do Christianity justice in a world dominated by technology. Become acquainted with the principles of critical thinking. "If we do not control the fundamental logical structures--the assumptions, values, and beliefs--that shape our own thought, feeling responses, and moral judgments, then in a significant sense we are not free" (Paul, 1984, p. 12).
7. Challenge old modes of thinking. Believe that the realization of emancipatory ideas is possible and act upon these ideas based on a realistic assessment of risk. Smith (1979) states, "Beliefs of some men of strong faith are false, having been formulated in a historical conditioning which was inaccurate" (p. 89).


9. Begin teaching children the basics of biblical interpretation at appropriate educational levels. Help them integrate the science they learn in their secular lives with the faith they develop at church. Expose them to critical thinking. The ultimate court of appeal of a free and open mind are the principles of comprehensive reason and evidence, not external authority, ego-identification, or technical expertise. The foundation for this capacity is established in the early years of life. It must be carefully communicated to children what behavior is rewarded and what behavior is discouraged.

Whether and to what extent children are persuaded that their goodness as human beings depends on believing what those in authority believe, when love and affection are contingent on specific belief states, those belief states become an integral part of children's identities. They become egocentric extensions of children, who are thus denied opportunities to separate their own beings from the belief structures that adults are, in effect, imposing. Children become literally dependent, intellectually and emotionally, on them and are unable later, without trauma, to subject them to serious critical scrutiny. In this way children are condemned to close-mindedness. (Paul, 1984, p. 12)

10. Define science. Study the philosophy of science and the scientific method. Identify its strengths and limitations. Determine what a theory is from a
scientist's viewpoint. Listen to a scientist, preferably one who is a Christian, explain the rudiments of evolutionary theory. Study the scientific data objectively.

11. Study higher criticism. Understand its history and purpose in biblical interpretation. Research how many and diverse authors explain Genesis 1 and 2. Invite ordained clergy from several perspectives to speak to this issue.

12. Become aware of your own religious acculturation which has resulted in a belief-centered religion which possibly understresses a life of faith and self-sacrificing love.

13. Identify authorities. Were they carefully chosen or inadvertently "inherited"? Are they qualified to speak to the issues? Upon what basis do they base their truth? Are they educators or propagandists? Do they encourage you to think autonomously?

14. Form networks and support groups of fellow learners. As Mezirow (1990) suggests, learn to create and facilitate
dialogic communities to enable learners to engage in rational discourse and action. From this vantage point, adult education becomes the process of assisting those who are fulfilling adult roles to understand the meaning of their experience by participating more fully and freely in rational discourse to validate expressed ideas and to take action upon the resulting insights. Rationality means assessing the validity of expressed ideas through reflective and critically reflective discourse. Rational thought and action are the cardinal goals of adult education. (Mezirow, 1990, p. 354)
Reflections and Applications for the Christian Church

Introduction

Christianity has a powerful potential for good for the individual as well as for society in general. It lifts up those qualities which elevate the human spirit: hope, faith, joy, trust, peace, forgiveness, dignity, and worth. It offers a personal relationship with the creator God. If conscientiously practiced, it can enrich one's life journey beyond measure. Christians who have experienced this are motivated to, in turn, share it with others.

The basic tenets of the faith are changeless, yet communicating the faith to a changeable world should be constantly part of the agenda of Christian leadership. The educated world heading towards the 21st century eschews old patterns, beliefs, ideas, or paradigms which do not speak to the realities of modern life. Religion which resents, resists, or rebels against change will be left to those who themselves refuse to change. It behooves Christian leaders and laity to take a hard look at how the world perceives the Christian faith.

A populace which is learning to critically think and which has become global must be met by a church which is up to serving it. Traditional, customary, historic attitudes or beliefs which no longer work or are inaccurate must be replaced. As Eiseley (1946) warns, "Never make the mistake of thinking life is now adjusted for eternity" (p. 48). This could surely be said for the church as well.

A major influence in the 20th century has been the impact of science upon all aspects of life. The information explosion has hit and the church cannot remain
detached or isolated. A church that adapts and continually assesses ways in which it can speak to a changing world will thrive. If it is seen as a belief system which rejects the realities of science and insists on a pre-scientific world view, its influence will diminish as the years go by. If it indoctrinates rather than demonstrates, propagandizes rather than educates, it will also weaken.

If the church could develop strategies to communicate the gospel in the context of a world dominated by science it could insure that its message would remain relevant to all people (Mangum, 1989, p. vi). James (1956) declares that those faiths will best stand the test which adopt the hypotheses of the scientists and integrate them into their own (p. xii). Roy (1981, p. 62) agrees.

It is recommended that serious Bible study might include preparatory training in the skills of critical thinking such as intellectual honesty, perseverance, courage, open-mindedness, and a willingness to confront new information honestly and without fear. The skills of healthy skepticism, the freedom to doubt, and the willingness to change are additional critical thinking characteristics which would augment Christian growth.

The role and significance of quality Christian education in the church cannot be understated. Many Christians have been taught a simplistic means of biblical interpretation in their youth and have not been given the opportunity, encouragement, or motivation to grow toward a more mature, sophisticated, and scholarly way of interpreting Scripture. One way to assist lay people in properly identifying and dealing with data coming from the technological and scientific
culture which seriously impacts faith would be to equip them with a strong foundation in Christian education.

It is recommended that children be taught these concepts with developmentally appropriate curricula. They can be taught to consider it natural that people differ in their beliefs and points of view. They can be instructed to respect contrary perceptions, and to learn from differing ways of thinking. Eventually, as they mature, they can be taught to empathize with the reasoning of those who disagree with them (Paul, 1993, p. 12). In classrooms, homes, or church settings that discourage attitudes of inquiry and skepticism, children learn to remain silent rather than risk embarrassment and disapproval by asking questions that teachers or other adults may consider dumb (Meyers, 1986, p. 9). Sometimes in religious settings such questions are even considered heretical, and this discourages free thought by the young. Skepticism, in religious circles, may be a negative word, yet for those who strive to attain critical thinking skills, it should be encouraged.

It would serve the Christian laity well if the discipline of Scripture interpretation were taught using the best hermeneutic methods and the skills of critical thinking. Mainline denominations which allow for a more figurative interpretation of the Scriptures, and therefore provide room for the theistic evolutionary viewpoint, may need to become organized and consider how they can teach correct interpretation to counter the strong influence of fundamentalist thinking, being careful to lead in a positive, sensitive, and compassionate manner.
In some respects this action has already begun. Adult education resources in some settings have already been written which speak to these very issues.

**Critical Thinking**

In many ways it was not surprising that critical thinking was not frequently detected in the comments given by many of the participants in this research. The data indicated that American education has not historically concentrated on critical thinking skills and that those who have achieved a level of expertise in such thinking may not transfer it to other parts of their lives such as politics, interpersonal relationships, faith, and morals. Hull (1985) writes of the two worlds within which many Christian adults operate, the world of their religious life and the world of normal, everyday living (p. 8). To Hull, crossover in these two areas does not occur, and critical thinking skills, if they were taught in the marketplace, may well not enter the sanctuary.

The historic norm within the church and confirmed by several in the present research, both Catholic and Protestant, was for the laity to be passive, to listen, to learn from authorities, to trust them, and to follow the acculturation of the traditions of past generations. Of course, there were and are many exceptions to this generalization, but, in the past, skepticism, autonomous thought, and questioning dialogue were not overtly encouraged and thus were not very prevalent within the church at large.
Hull (1985) maintains,

The autonomous person, to put it rather simply, is able to think for herself. But to what extent is autonomy a Christian virtue? The reader of almost any history of Western spirituality will notice how frequently the saints become saints because in their docility and obedience they were faithful children of the church, whereas those who thought for themselves were dangerous, proud, and even heretical. In an organization which places a premium upon conservation rather than innovation, anyone who attempts to think for herself is bound to arouse suspicion. The Protestant emphasis upon education was often accompanied by a fear of too much education, and it is significant that the Protestant groups who did most in England to establish schools and universities in the nineteenth century were often those who were thought to be too bold and independent in their thinking, namely, the Quakers and the Unitarians. (p. 16)

While revelation, transcendence, and the mystery of the faith will always be a major component of Christianity, if the skills of critical thinking are not employed, this religion may not relate as effectively to the highly trained members of the information loaded, advanced technological world of the present era. Scholarship with spiritual discernment would be a winning combination in order to insure relevance in a changeable and complex world.

If the laity and pastors were encouraged to search and to think autonomously and if the church community would resolve to provide a supportive haven for all who exercise their minds as they travel their faith journey, conflicts such as the creation/evolution controversy may be fewer and less intense. May (1981) notes that in the legend of the Grand Inquisitor in Dostoevski's The Brothers Karamazov the yearning for security and authoritarian guidance, as promised by the church, robbed people of wonder, independence, and autonomy.
People felt secure in being told what to believe, yet they surrendered their own minds. May asks, "Do we choose comfort rather than risk, stagnant certainty rather than creative doubt" (p. 71)? Personal freedom entails being able to harbor various possibilities and then being allowed to choose to change or choose to remain the same. This autonomy, according to May (1981), is the "underpinning of independence and the guardian of the human spirit" (p. 72) and is necessary in achieving human dignity.

Jesus modelled critical thinking as a master teacher, questioning, challenging, pricking, explaining, describing. The Apostle Paul wrote long discourses attempting to interpret the doctrines of the faith. His converts were not dogmatically given information with no attempt to provide for their understanding. The Jewish rabbis modelled debate, question, answer, study, scholarship. The well known episode of Jesus as a boy interchanging with the elders in the temple (Luke 2:40-52) gives a glimpse of the milieu of intellectual stimulation prevalent in the community of his time.

It would facilitate openness and personal growth if critical thinking skills were more universally taught on all educational levels and in all educational settings. As Fosdick (1958) declared, we should have no fear of the truth (p. 273). Glaser (1985) states,

The development of critical thinking ability is a crucial objective of the educational process ... because it contributes to the intellectual and social competence of the individual and helps that individual to meet more effectively the problems he/she encounters ... It helps the citizen form intelligent judgments on public issues and thus
Contribute democratically to the solution to social problems. Perhaps at no time in our history has wider realization of this educational objective been more urgently needed. (p. 27)

Since critical thinking encompasses humility and openness, Christians would be more forebearing and tolerant of alternative points of view. Presumably this would enhance community and understanding within Christendom, and strengthen the perception of Christianity within the non-Christian world.

However, there is a dimension of the transcendent within Christianity, and in all religions, where subjective feelings, revealed truths, and the belief of the heart rather than of the mind dominates. Trust, hope, and faith are not measurable quantities. The peace of God cannot be achieved rationally. There are inexplicable, spiritual, and profoundly psychological aspects of the religious arena which the mind, though it tries, cannot fully fathom. There are questions which will not be answered by empiricism or reason, such as what happens after death, how the incarnation occurred, what is faith or love, why there is evil, what is God really like, or how is the awe of worship explained? The cognitive and the affective dimensions are interdependent and intertwined.

No doubt there is a spectrum, including on the one extreme those who relish using the mind, who rationally and critically reflect within their religious experience. On the other extreme are those who are more affective and heart centered. Factors such as genetics, gender, acculturation, age, and experience all influence where one finds oneself on the spectrum. Jesus modelled accepting persons where they were and affirming who they were. His favor was unmerited,
Likewise, tolerance for wherever one is found on the spectrum is a beginning to the resolution of the creationism/evolution conflict.

Seventy individuals were interviewed in some depth. All were searching, hoping, striving, resting, believing, struggling. They were all alike in many ways: gracious, open, trusting, willing to help, devoted, concerned for the faith, bonded to a Lord whom they all related to personally. The many similarities were quite evident, in spite of the disparity of critical thinking skills, educational levels, belief differences on the subjects of creationism and evolution, or position along the cognitive/affective spectrum.

Doubt

Theistic evolutionists, generally being more educated, are more aware of the complexity of this problem and must honestly admit to puzzlement and uncertainties. It can be easier to believe in a spoken miracle by an omnipotent creator than to sleuth through the data of the millennia to find answers. It is easier to read literally than to interpret meaning from other cultures and eras. Many dilemmas remain. Also, since theistic evolutionists are not all convinced of the infallibility and inerrancy of the Bible, they are free to entertain more questions. Some difficulties, on the other hand, become resolved when Scripture is seen in the light of its original setting and as its development is understood.

Christians from environments, including church settings, which do not discourage questioning are not upset by the lack of absolutes. While most
creationists were seen to be quite secure in their beliefs, this data showed the honest questions of many. It is hoped they would be free to express these reservations and questions to the authority figures in their churches and gain resolution in time.

Accepting the unknown without question through faith is often perceived in the Christian world as spiritual strength, and skepticism is frowned upon, being seen as spiritual weakness. Some, not being as aware of the host of factors which might bring question or doubt to their faith, do not find it challenged. Others, to be intellectually honest, must pursue the more difficult road of uncertainty.

The human need for absolutes and security feeds into false contentment and intolerance for ambiguity. Tentativeness, and the willingness to re-examine, to change, to grow in insight, is always an ingredient in authentic critical thinking. Hull (1985) notes, "Years ago in theological college students were told to preach certainties not problems. This was bad advice then and would be worse if given today. Problems must be confronted. Certainties can only be defended if problems are attacked" (p. x).

**Biblical Interpretation**

Creationists are bound by a loyalty to a literal interpretation of the creation accounts in Genesis even though they concede that other parts of the Bible can be interpreted figuratively, such as when Jesus said, "I am the vine." It remains unclear how it is determined which Scriptures can be taken figuratively and which
must be interpreted literally, and upon what basis it is that Genesis 1 and 2 must be interpreted in the literal manner.

When one begins with the literal premise, there is no opportunity for interpretive option, nor need for original thought. When Genesis is viewed as literal and inerrant, proponents must believe that creation occurred in six 24-hour days, and all scientific data is interpreted in light of that premise. The factual, literal account is unquestionably accepted by faith. Theistic evolutionists are free to consider and employ the newer hermeneutic models for interpreting Scripture which enables them to see the accounts of creation in Genesis not as literal, factual histories but as the literary form of myth incorporating profound theological messages.

Many creationists believe, and it was borne out in this research, that to take the Genesis creation accounts figuratively means that other parts of the Scripture could then be taken figuratively and that threatens their essential and fundamental beliefs on salvation and redemption. They reason that if the literal truth of Genesis 1 falls, so falls the trustworthiness of the whole Bible. This would not be threatening if the Scriptures were seen in light of their original purpose and understood to be a vast storehouse of literary forms which need to be individually considered. But many Christians are not willing to entertain new means of studying the Scriptures, operating under the assumption that the way they interpret them is the right and only way, and that the people who taught them that method were absolutely reliable and unerring. This unwillingness to be open to a new
insight, to entertain the fact that they may indeed be in error, or to consider an alternative idea is the antithesis of critical thinking. If this narrow mentality continues, there is little hope for a resolution of this problem within Christendom and many express pessimism because they see the tenacity, grounded in religious ardor, of those with closed minds on this subject.

Creationists also become concerned about human origins, the basis for the doctrine of sin, and their young Earth and worldwide flood theories when they think of a nonliteral perspective on Genesis. All of these bring the uncertainties which have been alluded to throughout this paper, and they destroy the absolutes which brought security. Mezirow (1991b) states, "We allow our meaning system to diminish our awareness of how things really are in order to avoid anxiety, creating a zone of blocked attention and self-deception" (p. 5). Kitchener and King (1991), in their research on the reflective judgment model, found that students at different educational levels enter the learning environment with markedly different assumptions about what and how something can be known and how to make judgments in light of these assumptions. They found that without higher education, students tended to score similarly to younger subjects on the same educational level, suggesting that education indeed makes a difference (p. 174).

To many, that does sum up this dilemma: Education makes a difference.
Christian Doctrine of Creation

The classical creeds of Christendom have declared a belief in one God, maker of heaven and Earth. His mighty power and great wisdom created and established all things, bringing them into existence out of non-existence. "His omnipotence and universal sovereignty were acknowledged for He was the Lord almighty, the Lord who governs the whole universe, and the master of all things". (Kelly, 1960, p. 83).

In 1712, Addison wrote the words to a hymn which heralds the creator God and affirms majestically in verse the theology of the doctrine of creation. Haydn, in 1798, composed the music.

The spacious firmament on high,
With all the blue ethereal sky,
And spangled heavens, a shining frame,
Their great Original proclaim:
The unwearied sun, from day to day,
Creator's power display,
And publishes to every land
The work of an almighty hand.

Soon as the evening shades prevail,
The moon takes up the wondrous tale,
And nightly to the listening earth
Repeats the story of her birth;
Whilst all the stars that round her burn,
And all the planets in their turn,
Confirm the tidings as they roll,
And spread the truth from pole to pole.

What though in solemn silence all
Move round this dark terrestrial ball?
What though no real voice nor sound
Amidst the radiant orbs be found?
In reason's ear they all rejoice,
And utter forth a glorious voice;  
Forever singing, as they shine,  
"The hand that made us is divine."
(The Hymnbook, 1955, p. 92)

The doctrine of creation further speaks to the relationship of the created to  
the creator and, specifically, the role of humans in the creative plan. It announces  
the purpose as well as the fact of creation. "In both Testaments, the doctrine  
stresses the complete dependence of the whole creation upon the Creator, the  
supreme position of honor and responsibility which God has given men, and the  
divine purpose which undergirds and controls the historical drama from its  
beginning to its consummation" (Anderson, 1962, p. 725).

This doctrine is more than an historic declaration that God created the  
universe. It encompasses some profound theological messages such as defining  
man's task and his relationship to God and affirms that history, from beginning to  
end, is under the sovereign purpose of God as revealed in Jesus Christ. Creation  
"sets the stage for the unfolding of the divine purpose and inaugurates a historical  
drama within which first Israel and, in the fullness of time, the church were  
destined to play a key role" (Anderson, 1962, p. 727).

This doctrine is a religious affirmation about the sovereignty of God which  
is manifested through his creative works and is the basis for adoring, trusting,  
fearing, and obeying him. God's creation was for the covenant. It provided  
both the setting and the foundation for the relationship between  
God and man which alone gives meaning to man's life. The works of  
God's creation are chiefly for the benefit of man, although they are  
tended to remind him constantly of the goodness of God and to
awaken within him the impulse to praise his Creator. (Anderson, 1962, p. 729)

In addition, this doctrine liberates humans from the two alternatives between which their thought often moves: "either the materialistic enjoyment of the natural world for its own sake, or the verdict that the world of change and death is essentially meaningless" (Anderson, 1962, p. 729). Much can also be said about the new creation expressed in the New Testament and the profound role Christ as redeemer takes within the whole span of history.

The accounts in Genesis as well as the many references to God as creator throughout all of the Scriptures have a much bigger message than merely to record an historic, 6-day activity. They are theological statements, not scientific or historic statements. Belief in the doctrine of creation encompasses all who see God as the ruler and originator of the cosmos and in no way denies those who see evolutionary theory or big bang theory as a means by which he may have accomplished these creative acts. Evolutionary theory makes no claim for or against a sovereign creator. It attempts to explain how the acts of creation may have occurred but detracts nothing from the power of the creator. Some, after understanding some of these mechanisms, say it exalts him further. A God of order and dependability who designs laws and works within them commands greater respect and awe for some moderns than a magician God who creates on apparent whim in a cloud of mystery.
Numerous participants expressed confusion between a belief in creationism and the Christian doctrine of creation. Many creationists could not comprehend that someone who believed in evolution could also believe the doctrine of creation. This exposes a glaring lack of information and understanding which fuels the confusion and suspicion surrounding the areas of origins and development. This may be the result of deficiencies in the teaching of science as well as theology and if the Christian community does not seriously commit to clarifying this point the misunderstandings will continue.

Theologian Brunner (1952) states,

The emphasis on the story of Creation at the beginning of the Bible has constantly led theologians to forsake the rule which they would otherwise follow, namely, that the basis of all Christian articles of faith is the Incarnate Word, Jesus Christ. So when we begin to study the subject of Creation in the Bible we ought to start with the first chapter of the Gospel of John, and some other passages of the New Testament, and not with the first chapter of Genesis. If we can make up our minds to stick to this rule, we shall be saved from many difficulties, which will inevitably occur if we begin with the story of Creation in the Old Testament. . . . It is characteristic of the New Testament statements about the Creator and the Creation that here the fact of Creation and the manner of Creation are stressed far less than the reason why the world was created and to what end; while the narrative of the Creation in Genesis says nothing about this at all. (pp. 6-7)

The serious conflict which has flourished for most of this century might well have been avoided if the advice of scholars such as Brunner had been heeded.
Creationist Leadership

There is no doubt that the motives of creationist leaders are sincere, coming from a sense of true religious call, and that they are committed to serving God through this medium. This researcher suggests, however, that they betray the trust of less educated people, who have come to respect them for their Christian leadership and academic credentials, by not giving the whole story, by not admitting the weaknesses and puzzlements of the creation science paradigm, by not addressing the supporting evolutionary data which has come from so many disciplines within the scientific community, and by not offering them the option of theistic evolution.

It must be noted that many creationists are well educated, holding advanced and impressive degrees. They are apparently not disturbed by or aware of the weaknesses in thinking and lack of evidential credibility of creation science, or the fact that many of the credentials of creation scientists are not in the areas of biology, geology, paleontology or even theology. The technical advisory board of the Institute for Creation Research is primarily composed of engineers, medical doctors, a food technologist, and a linguist (H. M. Morris, 1995). Why is there a dearth of biologists, geologists, and paleontologists? One can only assume that there are very few who can be found who espouse creationist dogma.

Learning enables adults to recognize if beliefs are impoverished and helps them correct and enrich old beliefs as well as embrace the new. Adults must be encouraged to expand horizons within reasonable risk. This frees them from
anonymous authorities, enabling them to develop the potentiality that lies within each one (Freire, 1973, p. 11). Walker and Marks (1981) note that there is an enormous susceptibility by humans to being influenced and they can be easily manipulated because of their hunger for direction and structure (p. 125).

**Toward Christian Unity**

The divisiveness which permeates some quarters of Christendom with respect to this subject matter is contrary to what Christ taught, and this condition might be alleviated if Christians were more tolerant of the diversity and individuality which occurs within the church. Presently, individuals are pressured to take sides against the stereotypically labelled "secular humanists," many of whom are their brothers and sisters in the faith but who espouse evolutionary theory. Such name calling does not advance Christian unity nor address Christ's prayer in the Gospel of John (17:11) "So that they may be one as we are one" (New International Version, 1973, p. 1132). Jesus did not pray for uniformity, but for unity. His desire was not that his followers be carbon copies of each other but that they be united in mutual respect and love. The love he modelled was the "in spite of" love, not the "because of" love. Christians don't love one another because they all agree on every point of doctrine. They love one another in spite of the fact that they disagree. This was the unique love that dumbfounded those in the first century who watched the early Christians, and it is still seen commonly in many
settings within the church. It was routinely observed in the interviews which were conducted for the present research.

Jesus gave a new commandment in John 13:34, "That you love one another as I have loved you." This love for one another, according to Jesus, was how the world would know that they belonged to him. The Apostle Paul enjoins the Romans (12:10) to be kindly affectioned toward each other, with brotherly love, each esteeming the other better than himself. Ephesians 4:32 states, "Be kind to each other, tenderhearted, forgiving one another."

Scholtes composed the words and wrote the music to what has become a signature hymn in contemporary Christianity. No doubt all Christians who sing this hymn concur in theory with its message:

We are one in the Spirit,
We are one in the Lord,
We are one in the Spirit,
We are one in the Lord,
And we pray that all unity may one day be restored.

Refrain:

And they'll know we are Christians
By our love, by our love,
Yes, they'll know we are Christians
By our love.

We will walk with each other,
We will walk hand in hand,
We will walk with each other,
We will walk hand in hand,
And together we'll spread the news
That God is in our land.
We will work with each other,  
We will work side by side,  
We will work with each other,  
We will work side by side,  
And we'll guard each man's dignity  
And save each man's pride.  
(The Worshipbook, 1975, pp. 619-620)

If creationists succeed in their crusade by winning the minds of the masses to the tenets of creation science, they must decide if it was worth the price: the division, the deception, the disillusionment, and the demeaning of what the spirit of Christianity was meant to be. Uniformity of all the peripheral beliefs of the faith is not sought, but unity of spirit, manifested by mutual respect, acceptance, forgiveness, humility, and the unconditional love modeled by Jesus Christ is. Uniformity brings a bondage, while critical thinking respects the freedom of all individuals to pursue their questions and be open to alternative paradigms as they search for truth. A Christianity which only speaks to the scientifically unsophisticated thwarts its ability to reach out to all people and faithfully fulfill its commission to go into all the world and proclaim the good news to every person.

* * * * * * *

Down how many roads among the stars must man propel himself in search of the final secret? The journey is difficult, immense, at times impossible, yet that will not deter some of us from attempting it. We cannot know all that has happened in the past, or the reason for all of these events, any more than we can with surety discern what lies ahead. We have joined the caravan, you might say, at a certain point; we will travel as far as we can, but we cannot in one lifetime see all that we would like to see or learn all that we hunger to know. (Eiseley, 1946, p. 12)

The entrance of thy words giveth light.  
(Psalms 119:130, King James Version)
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Highlander Research and Education Center: An approach to education presented through a collection of writings. (1989). New Market, TN.


Institute for Creation Research, brochure. (undated).


APPENDIX A

HISTORICAL RELATIONSHIP BETWEEN
WESTERN CHRISTIANITY AND SCIENCE
TIMELINE OF INFLUENTIAL EVENTS IN THE HISTORY OF THE RELATIONSHIP BETWEEN WESTERN CHRISTIANITY AND SCIENCE

(Set in Cultural and Historical Context)

Aside from alchemy and astrology, where the magical outlook prevailed, science in the Middle Ages gained notable achievements in the study of tides, rainbows, the heating of the earth by the sun, the elements and how they combine, motion of objects (height of study in 14th c., at the University of Paris and Oxford University), movements of heavenly bodies (studied to set religious feasts days). Arab science flourished in the Middle Ages.

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1512</td>
<td>Michelangelo completed the ceiling of the Sistine Chapel, Rome</td>
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<tr>
<td>1517</td>
<td>Martin Luther posts 95 Theses, Whittenberg, Germany</td>
</tr>
<tr>
<td>1530</td>
<td>Nicolas Copernicus's <em>De Revolutionibus Orbium Coelestium</em> published</td>
</tr>
<tr>
<td>1534</td>
<td>Church in England separated from papal authority</td>
</tr>
<tr>
<td>1540</td>
<td>Society of Jesus founded (Jesuit Order)</td>
</tr>
<tr>
<td>1545</td>
<td>Council of Trent convened</td>
</tr>
<tr>
<td>1601</td>
<td>Shakespeare's Hamlet published, London</td>
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<tr>
<td>1603</td>
<td>Pontifical Academy of Sciences founded, Rome</td>
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<tr>
<td>1607</td>
<td>Smith founds Jamestown</td>
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<tr>
<td>1608</td>
<td>Champlain founds Quebec</td>
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<tr>
<td>1610</td>
<td>Galileo Galilei's <em>Sidereus Nuncius</em> published (with observations of moons on Jupiter)</td>
</tr>
<tr>
<td>1611</td>
<td>King James version of the Bible published</td>
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<tr>
<td>1621</td>
<td>Johannes Kepler's <em>Epitome of Copernican Astronomy</em> published</td>
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<tr>
<td>1630</td>
<td>Puritans found Boston</td>
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<tr>
<td>1633</td>
<td>Galileo convicted of suspected heresy; sentenced to life imprisonment</td>
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<tr>
<td>1644</td>
<td>Rene' Descartes' <em>Principia Philosophiae</em> published, Amsterdam, considered the beginning of the &quot;Age of Reason&quot;</td>
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<tr>
<td>1648</td>
<td>Peace of Westphalia ends religious wars in Europe</td>
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<tr>
<td>1653</td>
<td>Taj Mahal finished</td>
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<tr>
<td>1687</td>
<td>Isaac Newton's <em>Philosophiae Naturalis Principia Mathematica</em> published, London</td>
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<td>1742</td>
<td>Handel's Messiah first performed, Dublin</td>
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<tr>
<td>1755</td>
<td>Moscow University founded</td>
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<tr>
<td>1769</td>
<td>Watt's steam engine patented</td>
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<tr>
<td>1776</td>
<td>United States Declaration of Independence made</td>
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<tr>
<td>1789</td>
<td>Storming of the Bastille, Paris</td>
</tr>
<tr>
<td>1821</td>
<td>Faraday's electric motor and generator</td>
</tr>
</tbody>
</table>
1823  Beethoven finished Ninth Symphony
1838  Charles Lyell's Elements of Geology published, London, standard text on
geological succession of rocks and fossils
1840  Publication of Bruno Bauer's Kritik der evangelischen Geschichte des
Johannes, Germany (new type of biblical scholarship, the "historical
critical method")
1848  Potato Famine in Ireland; California gold rush
1854  Thoreau's Walden published
1859  Darwin's Origin of Species published, London and New York
1860  Huxley-Wilberforce confrontation, Oxford
1863  Abraham Lincoln issues Emancipation Proclamation
1864  Spencer's First Principles published, London
1869  Suez Canal opened
1870  Pastor Aeternus (Pius IX): dogma of papal infallibility "in doctrine
regarding faith and morals"; forcible seizure of papal lands by Italian
King Victor Emmanuel II
1871  Darwin's Descent of Man published, London and New York
1875  John William Draper's History of the Conflict between Religion and
Science published, New York; Mary Baker Eddy's Science and Health
published
1876  Bell invents the telephone
1878  Leo XIII becomes pope, a friend and proponent of science
1880  Pavlov's experiments with conditioned reflex in dogs
1884  Pasteur's first inoculations against rabies; Twain's Huckleberry Finn
published
1889  Publication of Lux Mundi, England, a collection of essays by Christian
evolutionists
1895  Publication of Andrew D. White's A History of the Warfare of Science
with Theology in Christendom
1898  Spanish-American War
1899  Scott Joplin writes Maple Leaf Rag
1902  Alfred Loisy's L'Evangile et l'Eglise published, Paris, "modernist"
reconciliation of biblical criticism with Roman Catholic theology
1905  Einstein publishes Special Theory of Relativity
1907  Pascendi gregis, Pius X's encyclical condemning Roman Catholic
"modernist" trends in theology and biblical scholarship
1909  Discovery of protons and electrons
1916  Einstein's General Theory of Relativity published
1917  Bolshevik Revolution in Russia
1919  Treaty of Versailles ends WWI; Lindbergh flies from New York to Paris
1925  Scopes "Monkey Trial," Tennessee; Edwin Hubble demonstrates existence
of galaxies beyond to our own
1929  New York Stock Market crash
1936  Spanish Civil War
1945  U.S. uses atomic bombs in war with Japan
1947  Independence of India from Great Britain
1953  Watson and Crick discover structure of DNA
1957  Publication of Teilhard de Chardin's Le Milieu Divin, Paris; launching of Sputnik
1963  Rachel Carson publishes Silent Spring, U.S.
1965  Civil Rights marches in Selma and Birmingham, Alabama
1967  Israeli-Arab Six-Day War
1969  First Moon Landing
1973  End of U.S. Involvement in Vietnam
1978  First test-tube baby born in Australia
1982  Arkansas "Balanced Treatment" Law struck down by U.S. District Court (ruling that "scientific creationism" may not be taught as science in public schools)
1984  Vatican commission admits error in condemning Galileo in 1633
1987  John Paul II's address, "The Church and the Scientific Community: A Common Quest for Understanding" 
1990  International group of scientists appeals to world religious leaders for cooperation in addressing ecological crisis, Moscow
1991  U.S. National Institute of Health awards grant to the Center for Theology and the Natural Sciences to conduct research on the theological and ethical implications of the Human Genome Project
1993  Palestinian-Israeli Peace Accord signed

(God and science: Must we choose?, 1993)
In the beginning God created the heavens and the earth. Now the earth was formless and empty, darkness was over the surface of the deep, and the Spirit of God was hovering over the waters.

And God said, "Let there be light," and there was light. God saw that the light was good, and he separated the light from the darkness. God called the light "day," and the darkness he called "night." And there was evening, and there was morning -- the first day.

And God said, "Let there be an expanse between the waters to separate water from water." So God made the expanse and separated the water, under the expanse from the water above it. And it was so. God called the expanse "sky." And there was evening, and there was morning -- the second day.

And God said, "Let the water under the sky be gathered to one place, and let dry ground appear." And it was so. God called the dry ground "land," and the gathered waters he called "seas." And God saw that it was good.

Then God said, "Let the land produce vegetation: seed-bearing plants and trees on the land that bear fruit with seed in it, according to their various kinds." And it was so. The land produced vegetation: plants bearing seed according to their kinds and trees bearing fruit with seed in it according to their kinds. And God saw that it was good. And there was evening, and there was morning -- the third day.

And God said, "Let there be lights in the expanse of the sky to separate the day from the night, and let them serve as signs to make seasons and days and years, and let them be lights in the expanse of the sky to give light on the earth." And it was so. God made two great lights -- the greater light to govern the day and the lesser light to govern the night. He also made the stars. God set them in the expanse of the sky to give light on the earth, to govern the day and the night, and to separate light from darkness. And God saw that it was good. And there was evening, and there was morning -- the fourth day.

And God said, "Let the water teem with living creatures, and let birds fly above the earth across the expanse of the sky." So God created the great creatures of the sea and every living and moving thing with which the water teems, according to their kinds, and every winged bird according to its kind. And God saw that it
was good. God blessed them and said, "Be fruitful and increase in number and fill the water in the seas, and let the birds increase on the earth." And there was evening, and there was morning -- the fifth day.

And God said, "Let the land produce living creatures according to their kinds: livestock, creatures that move along the ground, and wild animals, each according to their kinds, the livestock according to their kinds, and all the creatures that move along the ground according to their kinds. And God saw that it was good.

Then God said, "Let us make man in our image, in our likeness, and let them rule over the fish of the sea and the birds of the air, over the livestock, over all the earth, and over all the creatures that move along the ground."

So God created man in his own image, in the image of God he created him; male and female he created them. God blessed them and said to them, "Be fruitful and increase in number; fill the earth and subdue it. Rule over the fish of the sea and the birds of the air and over every living creature that moves on the ground."

Then God said, "I give you every seed-bearing plant on the face of the whole earth and every tree that has fruit with seed in it. They will be yours for food. And to all the beasts of the earth and all the birds of the air and all the creatures that move on the ground -- everything that has the breath of life in it -- I give every green plant for food." And it was so.

God saw all that he had made, and it was very good. And there was evening, and there was morning -- the sixth day. Thus the heavens and the earth were completed in all their vast array.

By the seventh day God had finished the work he had been doing; so on the seventh day he rested from all his work. And God blessed the seventh day and made it holy, because on it he rested from all the work of creating that he had done.
APPENDIX C

ADDITIONAL BIBLICAL CREATION TEXTS
This is the account of the heavens and the earth when they were created. When the Lord God made the earth and the heavens -- and no shrub of the field had yet appeared on the earth and no plant of the field had yet sprung up, for the Lord God had not sent rain on the earth and there was no man to work the ground, but streams came up from the earth and watered the whole surface of the ground -- the Lord God formed the man from the dust of the ground and breathed into his nostrils the breath of life, and the man became a living being.

Now the Lord God had planted a garden in the east, in Eden; and there he put the man he had formed. And the Lord God made all kinds of trees grow out of the ground -- trees that were pleasing to the eye and good for food. In the middle of the garden were the tree of life and the tree of the knowledge of good and evil.

A river watering the garden flowed from Eden; from there it was separated into four headwaters. The name of the first is the Pishon; it winds through the entire land of Havilah, where there is gold. (The gold of that land is good; aromatic resin and onyx are also there.) The name of the second river is the Gihon; it winds through the entire land of Cush. The name of the third river is the Tigris; it runs along the east side of Asshur. And the fourth river is the Euphrates.

The Lord God took the man and put him in the Garden of Eden to work it and take care of it. And the Lord God commanded the man, "You are free to eat from any tree in the garden; but you must not eat from the tree of the knowledge of good and evil, for when you eat of it you will surely die."

The Lord God said, "It is not good for the man to be alone. I will make a helper suitable for him."

Now the Lord God had formed out of the ground all the beasts of the field and all the birds of the air. He brought them to the man to see what he would name them; and whatever the man called each living creature, that was its name. So the man gave names to all the livestock, the birds of the air and all the beasts of the field.

But for Adam no suitable helper was found. So the Lord God caused the man to fall into a deep sleep; and while he was sleeping, he took one of the man's ribs and closed up the place with flesh. Then the Lord God made a woman from the rib he had taken out of the man, and he brought her to the man.
The man said, "This is now bone of my bones and flesh of my flesh; she shall be called 'woman,' for she was taken out of man."

For this reason a man will leave his father and mother and be united to his wife, and they will become one flesh.

**Job 38:4-14**

New International Version of the Holy Bible

Where were you when I laid the earth's foundation?  
Tell me, if you understand.  
Who marked off its dimensions? Surely you know!  
Who stretched a measuring line across it?  
On what were its footings set, or who laid its cornerstone -- while the morning stars sang together and all the angels shouted for joy?

Who shut up the sea behind doors when it burst forth from the womb, when I made the clouds its garment and wrapped it in thick darkness, when I fixed limits for it and set its doors and bars in place, when I said, 'This far you may come and no farther; here is where your proud waves halt'?

Have you ever given orders to the morning, or shown the dawn its place, that it might take the earth by the edges and shake the wicked out of it? The earth takes shape like clay under a seal; its features stand out like those of a garment.

**Psalms 104:2-5**

New International Version of the Holy Bible

He wraps himself in light as with a garment; he stretches out the heavens like a tent and lays the beams of his upper chambers on their waters. He makes the clouds his chariot and rides on the wings of the wind. He makes the winds his messengers, flames of fire his servants. He set the earth on its foundations; it can never be moved.
The Gospel of John 1:1-5
New International Version of the Holy Bible

In the beginning was the Word, and the Word was with God, and the Word was God. He was with God in the beginning. Through him all things were made; without him nothing was made that has been made. In him was life, and that life was the light of men. The light shines in the darkness, but the darkness has not understood it.

Proverbs 8:22-29
New International Version of the Holy Bible

The Lord brought me forth as the first of his works, before his deeds of old; I was appointed from eternity, from the beginning, before the world began. When there were no oceans, I was given birth, when there were no springs abounding with water; before the mountains were settled in place, before the hills, I was given birth, before he made the earth or its fields or any of the dust of the world.

I was there when he set the heavens in place, when he marked out the horizon on the face of the deep, when he established the clouds above and fixed securely the fountains of the deep, when he gave the sea its boundary so the waters would not overstep his command, and when he marked out the foundations of the earth.
APPENDIX D

CREATION REFERENCES IN THE OLD AND NEW TESTAMENTS
<table>
<thead>
<tr>
<th>Old Testament</th>
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<tbody>
<tr>
<td>Genesis 1</td>
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<td>Genesis 2</td>
<td>Isaiah 45:12, 15-18, 21-23</td>
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<td>Exodus 20:11</td>
<td>Isaiah 48:13</td>
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<td>I Samuel 2:8</td>
<td>Jeremiah 10:11-13</td>
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<td>II Kings 19:15</td>
<td>Jeremiah 31:35</td>
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<td>Job 9:8-10</td>
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<td>Ecclesiastes 3:11</td>
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<td>Job 26:7-14</td>
<td>Ecclesiastes 12:1</td>
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<td>Job 38:4-11</td>
<td>Amos 5:8</td>
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<td>Amos 9:6</td>
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APPENDIX E

THE GOSPEL OF MATTHEW 12:1-14
At that time Jesus went through the grainfields on the Sabbath. His disciples were hungry and began to pick some heads of grain and eat them. When the Pharisees saw this, they said to him, "Look! Your disciples are doing what is unlawful on the Sabbath."

He answered, "Haven't you read what David did when he and his companions were hungry? He entered the house of God, and he and his companions ate the consecrated bread—which was not lawful for them to do, but only for the priests. Or haven't you read in the Law that on the Sabbath the priests in the temple desecrate the day and yet are innocent? I tell you that one greater than the temple is here. If you had known what these words mean, 'I desire mercy, not sacrifice,' you would not have condemned the innocent. For the Son of Man is Lord of the Sabbath."

Going on from that place, he went into their synagogue, and a man with a shriveled hand was there. Looking for a reason to accuse Jesus, they asked him, "Is it lawful to heal on the Sabbath?"

He said to them, "If any of you has a sheep and it falls into a pit on the Sabbath, will you not take hold of it and lift it out? How much more valuable is a man than a sheep! Therefore it is lawful to do good on the Sabbath."

Then he said to the man, "Stretch out your hand." So he stretched it out and it was completely restored, just as sound as the other. But the Pharisees went out and plotted how they might kill Jesus.
APPENDIX F

FUNDAMENTALISM: DESCRIPTION, HISTORIC OVERVIEW, AND COMMENTARY
Fundamentalists compose a significant branch of American Protestant Christianity which holds a conservative and more authoritarian theology. Along with affirming the fundamental tenets of Christianity, they adhere to a strict belief in the literal interpretation and infallibility of the Bible. Marsden (1987) states that their theology often includes an elaborate system of biblical interpretation known as dispensationalism which interprets "all of history on the basis of the Bible, following the principle of 'literal where possible'; biblical prophesies, especially, are taken to refer to real historical events" (p. 192).

Fundamentalists tend to belong to independent churches and the more theologically conservative denominations such as the Church of God, the General Association of Regular Baptists, and Missouri Synod Lutherans. They are quite uniform in belief and in biblical interpretation even on issues that are not basic to the faith. They are fervent in evangelism and mission and in recent years have become politically active, forming the Moral Majority in 1979, and they have influenced thinking in areas such as abortion, homosexuality, and the teaching of evolution in the public schools. Because of their literal interpretation of the Bible, fundamentalists usually hold to the creationist position on origins.

Marsden pinpoints 1920 as the time when the term fundamentalism originated, referring to Christians who considered it their chief duty to combat "modernist" theology and certain secularizing cultural trends. He states that they are distinguished by extreme militancy against theological liberalism and this has
led to a separatist mentality which has often even divided them among themselves (pp. 195-196).

According to Donaldson (1988), the term "fundamentalist" began in 1910 with the publication in Chicago of some pamphlets, "The Fundamentals," distributed to 3,000,000 people. They outlined five fundamentals of Christianity: the infallibility or inerrancy of the Bible, Christ's virgin birth, his substitutionary atonement, resurrection, and second coming (p. 108). The pamphlets were underwritten by two wealthy Christian laymen from Los Angeles and authored by a distinguished group of conservative, interdenominational, Protestant theologians from Great Britain and the United States. They were sent to pastors, evangelists, professors of theology and students, Sunday School superintendents, and YWCA and YMCA secretaries in the English speaking world.

Ahlstrom (1972) reports there were twelve writings and he describes them as volumes. He claims that the term "fundamentalist" was used prior to this period but suggests this was the launching of the fundamentalist movement. He describes this effort as having dignity, breadth of subject matter, rhetorical moderation, conviction, and considerable intellectual power (pp. 815-16). Moore (1983) suggests that these writings were moderate in tone compared to the positions that fundamentalists adopted after 1920. At that time they were characterized by a more stringent militancy when they waged a holy war to save American civilization from the modern liberalism trend and the impact of the theory of evolution (p. 100).
Perhaps the greatest general difficulty which any Fundamentalist faces is the sharp contrast between his approach to the subject of religion and his approach to most other fields of thought. His methodology, or lack of it, puts his religion in such a light that no secular experience can ever shed any light on his religious experience. As a consequence, his intellectual life is schizophrenic, for his religion makes no contact with the rest of human effort. He may accept the findings of diagnostic and curative medicine, but these are divorced from his religious commitments. He may be a courageous and enthusiastic democrat, but he still idolizes scriptural stories in which medieval lords and tyrants are the heroes. If he studies biology, anthropology, and geology and accepts these disciplines as contributing to the store of human knowledge, then his religion, by contrast, will seem a pretty naive affair with its six-thousand-year-old world, fixed species, and providential laws. If he rejects the findings of these sciences, then he puts himself in a most unfavorable light among scholars. All of these situations could be avoided . . . by insisting that the religious explanation be amenable to the methods of science . . . The Protestant Fundamentalist, therefore, must be an intellectual anachronism if he is to hold his position seriously.

A specific aspect of this difficulty arises when biblical scholarship is admitted to be a possibility. Historical, critical, and philological analyses of the Bible make Fundamentalism, at the point of biblical inerrancy, a pretty indefensible position. The alternative which the Fundamentalist has is to reject all scriptural scholarship, but this option puts the Book in an area which makes it beyond both dispute and support. If the Bible is to be discussed at all, then biblical scholarship must be admitted. If biblical scholarship is to be rejected, then the Bible can never be cogently talked about. It is quite understandable that the Fundamentalist feels himself to be put in a dilemma, but this very fact suggests that there is at least one self-contradiction entailed in the position of Protestant conservatism. (Wells, 1962, pp. 304-305)
APPENDIX G

MAINLINE PROTESTANT DENOMINATIONS: DESCRIPTION, HISTORIC OVERVIEW, AND COMMENTARY
Mainline Protestant denominations include a large segment of contemporary Protestant Christians who represent the traditional theology of Protestantism. This theology includes the virgin birth of Christ and his substitutionary atonement, resurrection, and second coming. It does not include biblical inerrancy or infallibility although members are free to hold such beliefs. Among mainline churches there are many variations of belief on that subject.

Examples of mainline churches are Episcopal, Presbyterian, Lutheran, Congregational, and Methodist denominations. These churches go back to the decades following the Reformation and historically they have represented Protestantism since that time. Mainline churches are connected, meaning there is a hierarchy of government, from the local to regional to national levels. While there is room for autonomy within the local congregation, basic theology and church government tend to be consistent throughout the denomination. Generally these groups are in agreement theologically, their main differences being in church government, their unique histories, and liturgies (forms of worship). Variety of interpretation is tolerated and even encouraged on the less central aspects of the faith and it is not uncommon to find belief disparity within a group.

Many members of mainline congregations express their faith by being active in community, political, cultural, and social service leadership. They have historically been in the forefront of social change such as integration and women's rights and other human rights issues. Many hold to a theistic evolutionary position,
believing in the general mechanisms of evolution but being convinced that a
creator God has in some way been the designer and guide.

The National Center for Science Education, Inc. publishes *Voices for
Evolution* (McCollister, 1989), a book including resolutions, statements, and
position papers from organizations—scientific, educational, and religious/
philosophical—which presents the views of groups of people on the
creation/evolution controversy. Mainline denominations which have documents
included in this book include the Episcopal, United Methodist, Lutheran, United
Presbyterian (now called Presbyterian Church USA), Unitarian-Universalist
Association, and United Church of Christ. The American Jewish Congress and
Pope John Paul II are included also.

It is significant to note some statements included, for instance, in the
segment from the Presbyterian Church USA. "But commitment is not simply the
acceptance of the truth of certain doctrinal statements. It is much more the
embodiment of the lifestyle of Jesus" (McCollister, 1989, p. 91). And, "Christian
love and respect for persons demand that all persons be free to search for the truth
wherever they may find it" (p. 92). "Our purpose is to help people consider how to
think rather than to dictate what they are to think" (p. 92). Affirmations include
uncompromising commitment to academic freedom, that is, freedom to teach and
to learn. Recommendations for congregations include "encouraging congregations
to study the issues in the creation-science controversy, giving particular attention to
the diversity of belief about creation and human origin present in our society" (p. 95).
The Presbyterian Church (USA) Book of Order (1993) states at the very beginning: "God alone is Lord of the conscience, and hath left it free from the doctrines and commandments of men" and "therefore we consider the rights of private judgment, in all matters that respect religion, as universal and unalienable" (G.1.0301).

The Episcopal Church states, "Resolved, that the 67th General Convention affirm the glorious ability of God to create in any manner, whether men understand it or not, and in this affirmation reject the limited insight and rigid dogmatism of the 'Creationist' movement" (McCollister, 1989, p. 73).

The United Church of Christ affirms its belief that the historic Christian doctrine of the Creator God does not depend on any particular account of the origins of life for its truth and validity. The effort of the creationists to change the book of Genesis into a scientific treatise dangerously obscures what we believe to be the theological purpose of Genesis, viz., to witness to the creation, meaning, and significance of the universe and of human existence under the governance of God. The assumption that the Bible contains scientific data about origins misreads a literature which emerged in a prescientific age. (McCollister, 1989, p. 83)
APPENDIX H

SEVEN-STAGE MODEL TOWARD REFLECTIVE JUDGMENT
Stage 1: Reality and knowledge about reality are identical, and known absolutely through the individual's perceptions. One's own views and those of authorities are congruent and they in turn are identical with absolute knowledge. Differences in opinion are not perceived, and justification is not necessary.

Stage 2: Objective reality exists and is known by someone but it may not be immediately available to the individual. Beliefs are based on the absolute knowledge of a legitimate authority.

Stage 3: There is an objective reality but it isn't always immediately known, even to legitimate authorities. Full knowledge is incomplete and therefore uncertain. Beliefs are based on an accumulation of evidence that leads to absolute knowledge, but it isn't always readily available and in the meantime people can believe whatever they choose.

Stage 4: There is an objective reality, but it can never be known without uncertainty by anyone. Absolute knowledge is impossible to attain and therefore always uncertain. There are many possible answers to every question. The individual is the ultimate source and judge of his or her own truth.

Stage 5: An objective understanding of reality is not possible since objective knowledge does not exist. Knowledge therefore is subjective but beliefs should be justified with appropriate decision rules.

Stage 6: An objective understanding of reality is not possible since our knowledge is subject to our own perceptions and interpretations. Some judgments may be more rational and based on stronger evidence. Knowledge claims can be
constructed through generalized principles of inquiry and by considering common elements across different perspectives. It is necessary for the knower to play an active role in the construction of such claims, and any justification is limited to a particular case, time, or issue.

Stage 7: There is an objective reality against which ideas and assumptions must ultimately be tested. It is possible with critical inquiry and evaluation to determine that some judgements are more correct than others. The process is fallible, however, and must be open to the scrutiny and criticism of others.

(Kitchener & King, 1981, pp. 89, 92-100)
APPENDIX I

QUESTIONNAIRE COMPLETED BY MEMBERS OF THE PRESBYTERIAN CHURCH AND STUDENTS AT THE COLLEGE OF GREAT FALLS
1. Check which of the following applies to you.

___ less than 35 years of age
___ between 35-50 years of age
___ over 50 years of age

2. Check which of the following applies to you.

___ completed parochial (religious) high school
___ completed public high school
___ completed church related college
___ completed public (secular college)
___ had graduate work
___ completed a graduate degree; state degree ______________________

3. Name of high school _____________________________________________
Name of college ___________________________________________________
Name of graduate school or seminary _________________________________

4. Which of the following would best describe your present belief?

___ I am a creationist (I believe God created the world in six days just a few
   thousand years ago).
___ I am a theistic evolutionist (I believe God created the world using the
   processes of evolution).
___ I am an evolutionist who believes the world got here by chance.
___ I am undecided about this subject.
___ Other (please explain)

5. Would you say

___ you have thought a lot about this subject.
___ you have thought very little about this subject.

6. Have you ever changed your belief about evolution and creationism?

___ yes
___ no

7. If you answered "yes" to number 6, what were the factors which led you to
change your belief? Please explain.
8. Check the factors which have most influenced your belief on the subject of creationism and evolution.

___ your family
___ your church
___ books/magazines/articles
___ seminars/workshops
___ school/college
___ seminary
___ radio/TV
___ your own prayer/study life
___ a particular person (youth leader, pastor, friend, teacher, other) (circle which one)
___ other (please explain)

9. Are there any areas of uncertainty in your thinking on the subject of evolution and creationism? Please explain.

10. Are there particular questions you wish you could have answered on this subject? Please explain.

Your willingness to be a part of this research project is sincerely appreciated. The data given in this survey will be used anonymously. However, if you are willing to be interviewed after the seminar for a follow up, would you kindly give your name, address and phone.

Name ______________________________

Address ___________________________ Phone ________________________
APPENDIX J

QUESTIONNAIRE COMPLETED BY ATTENDEES AT CREATIONIST AND LUTHERAN SEMINARS
1. Check which of the following applies to you.
   ___ less than 35 years of age
   ___ between 35-50 years of age
   ___ over 50 years of age

2. Check which of the following applies to you.
   ___ completed parochial (religious) high school
   ___ completed public high school
   ___ completed church related college
   ___ completed public (secular college)
   ___ had graduate work
   ___ completed a graduate degree; state degree ______

3. Name of high school _______________________________________________
   Name of college ___________________________________________________
   Name of graduate school or seminary _________________________________

4. Check which of the following applies to you.
   ___ I am a lay person (give church)
   ___ I am a pastor (give church)

5. Which of the following would best describe your present belief?
   ___ I am a creationist (I believe God created the world in six days just a few thousand years ago).
   ___ I am a theistic evolutionist (I believe God created the world using the processes of evolution).
   ___ I am an evolutionist who believes the world got here by chance.
   ___ I am undecided about this subject.
   ___ Other (please explain)

6. Would you say
   ___ you have thought a lot about this subject.
   ___ you have thought very little about this subject.

7. Have you ever changed your belief about evolution and creationism?
   ___ yes
   ___ no
8. If you answered "yes" to number 7, what were the factors which led you to change your belief? Please explain.

9. Check the factors which have most influenced your belief on the subject of creationism and evolution.

____ your family
____ your church
____ books/magazines/articles
____ seminars/workshops
____ school/college
____ seminary
____ radio/TV
____ your own prayer/study life
____ a particular person (youth leader, pastor, friend, teacher, other) (circle which one)
____ other (please explain)

10. Are there any areas of uncertainty in your thinking on the subject of evolution and creationism? Please explain.

11. Are there particular answers you are looking forward to receiving from this seminar? Please explain.

Your willingness to be a part of this research project is sincerely appreciated. The data given in this survey will be used anonymously. However, if you are willing to be interviewed after the seminar for a follow up, would you kindly give your name, address and phone.

Name __________________________________________

Address _________________________________________ Phone ________
APPENDIX K

SAMPLE INTERVIEW QUESTIONS
1. I see by your questionnaire that you describe yourself as a creationist (evolutionist, theistic evolutionist). Could you tell me the basis for this belief? What factors have led you to this belief? Are you convinced it was the best criteria?

2. Do you believe differently on this subject today than at some other time in your life? What contributed to your belief change? Describe what you went through in making that change. What factors helped the change? What factors hindered it? Was that change easy? Why or why not? Did the belief change take time? How long?

3. Have you ever doubted your beliefs on this subject? What is the basis for your doubts? How do you deal with them?

4. Are you interested to learn more about what creationists (or evolutionists) believe? Have you studied their belief? Do you think that their belief is based on truth? Why have you rejected that belief?

5. Are you leery to learn about data which may challenge your belief?

6. Do you believe parts of the Bible could be interpreted as metaphor, parable, or non-literal language? Do you think Genesis Chapters 1 and 2 could be so interpreted? How do you explain such phrases as "God stretched forth his hands" or "The Lord is my shepherd"?

7. Could you ever see yourself as taking the Biblical narrative as allegory if science were able to prove evolution beyond a shadow of a doubt?

8. Have you been encouraged to question your beliefs? Do you think on your own and consider all sides of this issue? Do you entertain a willingness to change belief?

9. Do you believe Christians should challenge their leaders more? Do you ever question the information or conclusions given by pastors or Bible teachers you hear on the radio or at church?
10. Do you believe devoted leaders might be wrong on a subject? On creationism or evolution? Is it possible that belief may not be based on fact?

11. Do you generally believe the same as your parents about interpreting the Bible?

12. When you read Christian literature do you ever question the author’s opinion or research his or her credentials?

13. Do you think it’s wrong to question or challenge or disagree with Christian leaders?

14. Do you think science interferes with, helps, or has no affect on faith?
Mr. Ken Ham  
ICR  
P. O. Box 2667  
El Cajon, CA 92021

Dear Mr. Ham:

I attended the two hour workshop you presented in Great Falls and I wish to thank you for that luncheon and the presentation. I look forward to attending the seminar next month.

I am a graduate student at Montana State University, working on a doctorate in education, specializing in how people undergo belief change, especially as it relates to matters of faith. I would appreciate very much being able to gather some data at your seminar next month and am writing to outline what would be helpful.

Yesterday I spoke with Mr. Looy at ICR and he was very gracious in explaining the time constraints of seminars and I do not want to interfere with your plan and understand that you wish to guard the time. He was sympathetic, however, with my wishes to gather data, being in a similar situation himself with a degree. He suggested I write you and explain what I needed. I would hope that some of my data might be of interest to your organization.

He suggested the possibility, and it would be fine with me, of my coming at 5:30 the night of registration and giving registrees, at random, a short pretest. I will enclose a sample of what that might be like. I would ask them to give me some means to contact them so that I could give a post-test after the seminar. I would not need to take any of the seminar time nor use participants' time during breaks if that could be accomplished.

The questions asked on the post-test would center around what changes, if any, had taken place as a result of the seminar. What factors were influential in causing belief change or confirming a previous belief.

I will appreciate hearing from you with regard to this project. I am open to your suggestions or modifications of this pre-test.

Sincerely,

Mrs. Margaret Towne
August 20, 1993

Mrs. Margaret Towne
1121 21st Avenue SW
Great Falls, MT 59404

Dear Margaret:

Thank you for your good letter of August 12 to Ken Ham. I have discussed your wish to distribute a pre-test at our seminar in Great Falls on Friday, September 24 with Mr. Ham. We are glad to allow you to do so, but please keep the following in mind:

1. We would request that you distribute your surveys between 5:30 and 6:30 pm — after 6:30, things will get very busy in the lobby and auditorium.

2. Because of the cluttered lobby, we will not be able to offer you any table space, but please feel free to approach seminar attendees on an individual basis.

3. May I suggest a rewriting of question five on your pre-test? For example, question five, letter "a" might better be written "I am a creationist who believes in a six-day creation just a few thousand years ago"; furthermore, you might want to leave a blank for someone who might be a "theistic evolutionist" (you may need to define that term for them).

We will be sending your free pass under separate cover. Again, that pass is good for you and your entire immediate family.

Sincerely yours,

Mark E. Looy
Senior Seminar Coordinator.

MEL:kd
September 17, 1993

To: Psychological Corporation

From: Robert A. Fellenz
Professor, Adult and Higher Education

Re: Permission to use the Watson-Glaser appraisal

The purpose of this memorandum is to endorse the use of the Watson-Glaser Critical Thinking Appraisal by Margaret Towne. I serve as the major advisor of Ms. Towne and chair of her doctoral committee. I can assure you that her research study has been carefully planned and will be conducted with appropriate supervision. She will, of course, follow standard procedures to ensure the security of the test and the anonymity of human research subjects.

In the past, I have had other doctoral students use the Watson-Glaser in research studies. It is an important instrument in a vital field of education and psychology.
October 11, 1993

Ms. Margaret G. Towne  
1121 21st Avenue S.W.  
Great Falls, Montana 59404

Dear Ms. Towne:

Thank you for your October 4 letter requesting permission to use the Watson-Glaser Critical Thinking Appraisal for testing purposes for use in your dissertation research.

In order to protect the combined usefulness of the test, and as a responsible test publisher, we believe it is our responsibility to maintain the security and integrity of our tests. Consequently, we cannot allow items or portions of the test to be bound in, stapled with or microfilmed with your dissertation. Sample items may be bound, but actual test items cannot and must be referred to by page and/or item number as stated in the test.

In addition, all testing should be conducted in your presence or that of your faculty advisor so that all test materials remain in your hands.

We will gladly grant permission for use of the test if the above restrictions will be adhered to. Please sign and return a copy of this letter to me for my files. Your order will be released upon receipt of this signed letter. Also, please forward a copy of your dissertation when it is completed so that I may retain a copy in our library. If you have any questions regarding the above please contact me directly.

Sincerely,

Christine Doebbler  
Supervisor  
Rights and Permissions

UNDERSTOOD AND AGREED

[Signature]

Name

Date

October 11, 1993

Ms. Margaret G. Towne  
1121 21st Avenue S.W.  
Great Falls, Montana 59404

Dear Ms. Towne:

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Sincerely,

Christine Doebbler  
Supervisor  
Rights and Permissions

UNDERSTOOD AND AGREED

[Signature]

Name

Date
Dear

I have been working on a doctoral degree in Adult and Higher Education at Montana State University for the past several years and am now ready to gather research data for my dissertation. Last September, the session of our church gave me permission to use the church membership roll for this study and you were chosen through a random sampling to be invited to be a part of this project. Your participation, of course, is completely voluntary.

The topic of my thesis is, "The Influence of Critical Thinking on Christians' Belief and Belief Change with Reference to the Polarities of Creationism and Organic Evolution". I am interested in what Christians believe on the subject of origins and how they have arrived at their beliefs, if they have ever undergone a belief change with respect to this subject matter, and what factors were involved in that change. There are no right or wrong answers. I have been collecting data from a variety of other Christians as well.

Could you kindly complete the enclosed questionnaire and return it to me in the stamped, self-addressed envelope by 15 January? Your willingness to do so is very much appreciated. I may later contact some respondees and request an interview. That, too, will be completely voluntary.

I would be happy to inform you of the results of this study when it is completed if you are interested. If you have any questions, please call me. Thank you very much for your time, interest, and cooperation. It is truly appreciated.

Sincerely,

Margaret G. Towne