



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.

Confusion relating to the scientific aspects of the question was noted in that many participants were poorly informed about the strengths and limitations of science. Some were confined to a literal approach to scriptural interpretation and forced to adapt their beliefs to that preset standard. Those with creationist persuasion generally did not employ critical thinking when establishing belief, even though they may have scored reasonably well on the critical thinking appraisal. There appeared to be minimal crossover of critical thinking skills to the area of faith on the part of creationists. A relationship was seen between belief in theistic evolution and increased formal education and this group expressed more insight into the verities of science and were more figurative in their biblical interpretation.. They also were generally open-minded, tended to reserve judgment, admitted to entertaining more doubts on this question, and endured more stress in their belief change experiences.

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  
1995

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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.

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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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## 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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## 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,

1993, p. 123). 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 Huyssteen (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.

Date	Event
1941	Founding of the <b>American Scientific Affiliation (ASA)</b> , a group of Christian scientists considering the relationship between faith and science
1954	Founding of the <b>Institute on Religion in an Age of Science (IRAS)</b> , with Harvard University astronomer Harlow Shapely as its first president
1966	Publication of the first issue of <i>Zygon: Journal of Religion and Science</i>
1968	Founding of the <b>Institute for Theological Encounter with Science and Technology (ITEST)</b> , St. Louis, MO
1981	Founding of the <b>Center for Theology and the Natural Sciences (CTNS)</b> , Berkeley, CA
1987	"The Church and the Scientific Community: A Common Quest for Understanding," letter from Pope John Paul II to international scientists convened at the Vatican Observatory
1988	Opening of the <b>Chicago Center for Religion and Science (CCRS)</b>
1989	First Ecumenical Roundtable on Science and Technology, held annually, with widening denominational participation
1989	Formation of the <b>Center for Faith and Science Exchange (FASE)</b> , Boston, MA
1990	"Preserving and Cherishing the Earth," an appeal for cooperation issued to the world's religious communities by an international group of scientists
1991	"The Joint Appeal in Religion and Science," a response from American religious leaders to the scientists' appeal of 1990
1991	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

(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, focusses 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,

1988, p. 11). See "Naturalism" and "Scientific materialism." Sometimes called evolutionism.

**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 CreationismHistorical 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.

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

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

built. 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. Bibliolatry 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, untrammled 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-serving mythology" (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 indicts 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



facts?' 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 prophecies 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

(p. 33). 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.

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

(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

quoted. 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) prophecies, (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 4. History of Pentateuchal Traditions.

Period	Dates	Stage
Patriarchal Period (Abraham and after)	ca. 1800-1300	Beginnings of oral tradition
Mosaic Period	ca. 1300-1250	
The Israelite Confederacy (Joshua and Judges)	ca. 1250-1000	Israelite story shaped orally
Period of the Monarchy (David to fall of nation)	1000-587	Beginning of written Pentateuchal tradition
Period of exile and restoration (to Ezra)	587-400	Completion of Pentateuchal tradition (Canon)

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 5. Literary Sources of the Pentateuch.

Source	Description	Dates
J	A Judean source, coming from the time of the early monarchy, which refers to the divine name Yahweh (sometimes spelled Jahweh)	ca. 950 B.C.
E	An Ephraimitic or North Israelitic source which favors the use of the divine name Elohim	ca. 850 B.C.
D	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.)	ca. 650 B.C. & later
P	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	ca. 550 B.C. & later

(Anderson, 1975, p. 19)

### 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 intended. 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 cosmogonies 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.

Genesis 1:1-2:4a	Genesis 2:4b-23
<ul style="list-style-type: none"> <li>- "P" or priestly author(s) who views the universe as God's temple in which the created beings worship their Creator</li> <li>- Creative activity of God expressed in orderly progression</li> <li>- Sabbath sanctioned by Deity as a day of rest</li> <li>- Man, the crown of God's creation, presides as divinely appointed high priest</li> <li>- Creative acts compressed into a schematic pattern of six days</li> </ul>	<ul style="list-style-type: none"> <li>- "J" author(s) refers to God as Jehovah (Jahweh in German) or Yahweh</li> <li>- More vivid and exuberant</li> <li>- Style more simple</li> <li>- Author less interested in matters pertaining to worship and ritual</li> <li>- Conception of God more anthropomorphic (He molds clay, breathes, plants, builds)</li> <li>- No schematic pattern of time</li> </ul>
<u>Order of Creation</u>	<u>Order of Creation</u>
<ol style="list-style-type: none"> <li>1. Light</li> <li>2. Firmament</li> <li>3. Dry land; vegetation</li> <li>4. Luminaries</li> <li>5. Birds; fish</li> <li>6. Animals; man(kind)</li> </ol>	<ol style="list-style-type: none"> <li>1. Man</li> <li>2. Garden of Eden</li> <li>3. Trees, including the Tree of Life, and the Tree of the Knowledge of Good and Evil</li> <li>4. Animals</li> <li>5. Woman</li> </ol>
<u>Similarities</u>	
<ul style="list-style-type: none"> <li>- The one true and living God is the sovereign Lord of Creation</li> <li>- This Lord is prior to, and distinct from the finite, material universe</li> <li>- God is the one, true, personal and loving God whose existence is unquestioned and whose authority is unchallenged.</li> <li>- 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.</li> </ul>	

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.

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

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)

An example of critical thinking is recorded in Luke 10:25-37 in the New Testament. A lawyer approached Jesus asking what he could do to inherit eternal life. Jesus referred him to the Scripture: "What is written in the law?" he asked him. "How do you read?" A regular rabbinical formula was "What do you read?" 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.

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

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 Cyrrihus 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, prophecies, 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-Guillemain, 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.

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

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 (Karlins & 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.

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

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 indoctrination, 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 (Karlins & 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 DesignNaturalistic 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.

	Number	Average Score	Range
Creationists	17*	64	49-72
Theistic Evolutionists	20	65	58-71
Other	5	62	46-71
Total	42		

\*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.

	Under 35 Years		36-50		Over 50 Years		Totals
	M	F	M	F	M	F	
College of Great Falls	5	8	0	3	1	1	18
Lutheran Seminar	2	3	6	9	5	6	33
Presbyterians	5	5	13	16	27	41	107
Creationist Seminar	10	14	23	35	7	14	103
Totals	22	30	42	63	40	64	261

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.

	Percent	Number
Creationist	51	134
Theistic Evolutionist	34	88
Other	15	39
Total	100	261

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.

	Creationist	Theistic Evolutionist	Other
College of Great Falls	11	50	39
Lutheran Seminar	12	62	26
Presbyterians	30	50	20
Creationist Seminar	91	1	8

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.

	No Uncertainty	Uncertainty
Creationist	82% (110)	18% (24)
Theistic Evolutionist	46% (41)	54% (47)
Other	33% (13)	67% (26)

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.

	No Uncertainty		Uncertainty	
	No.	%	No.	%
College of Great Falls	4	22	14	77
Lutheran Seminar	12	36	21	64
Presbyterians	63	59	44	41
Creationist Seminar	83	81	20	19

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.

	High School	College	Graduate School	Completed Graduate Degree
Creationist (134)	62% (84)	16% (22)	11% (15)	11% (13)
Theistic Evolutionist (88)	18% (16)	18% (16)	28% (25)	35% (31)
Other (39)	33% (13)	23% (9)	31% (12)	13% (5)

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.

	Under 35	36 - 50	Over 50
Creationist	29	68	37
Theistic Evolutionist	14	31	43
Other	9	6	24
Total	52	105	104

Table 19. Factors Which Influenced Belief in Rank Order.

College of Great Falls	Lutheran Seminar	Presbyterians	Creationist Seminar
people	people	church	people
school	church	school	prayer
books	school	books	church
family	books	people	books
prayer	prayer	family	media

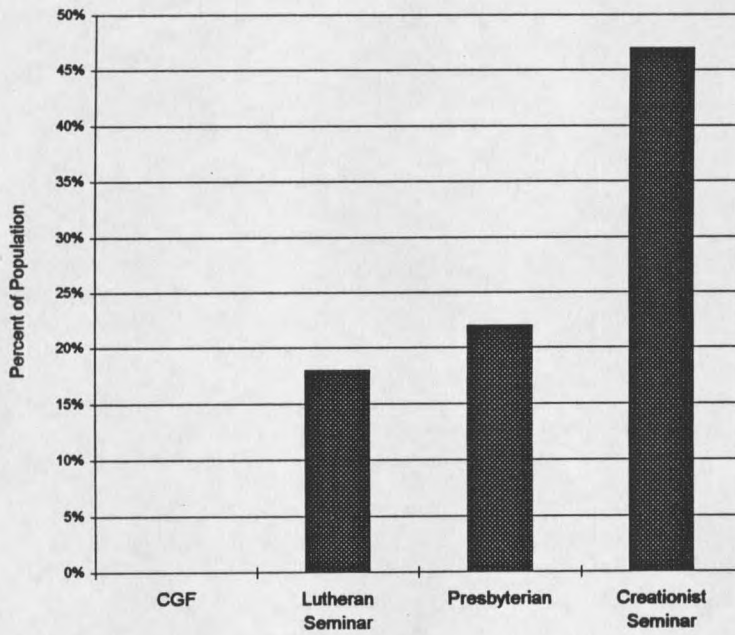


Figure 1. Percent of Each Group Terminating Education at High School.

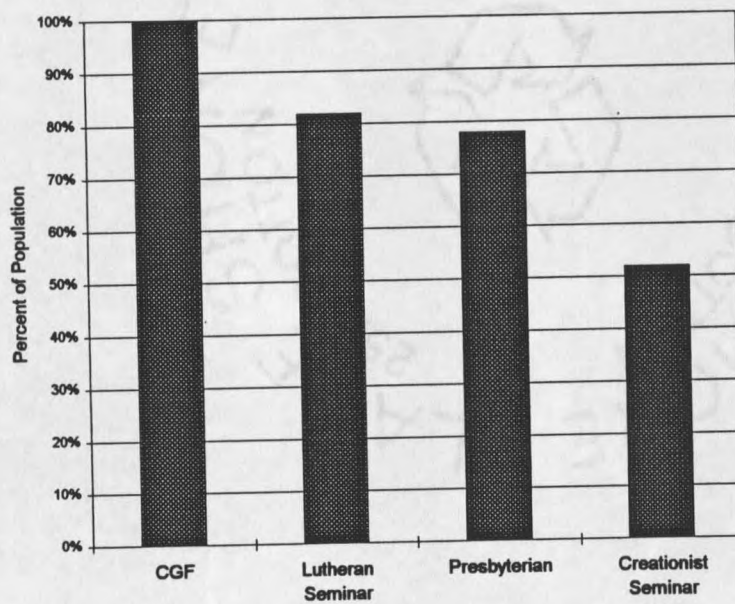


Figure 2. Percent of Each Group Attending College.



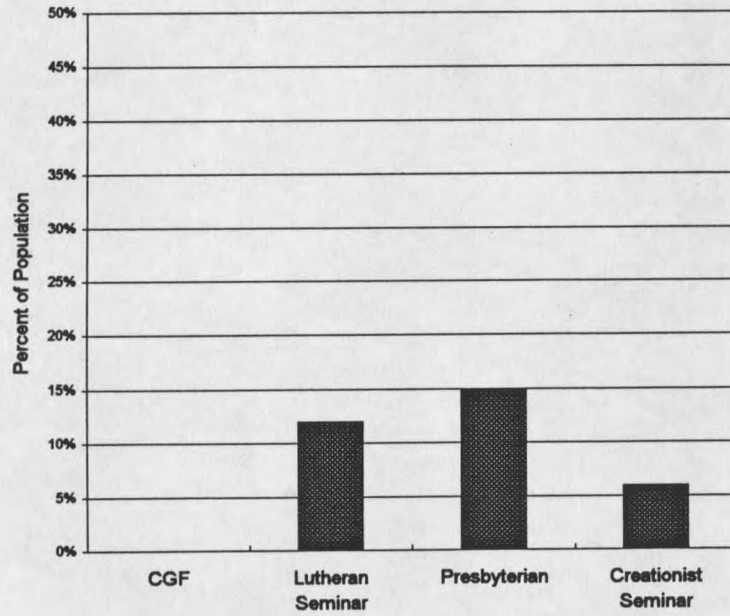


Figure 3. Percent of Each Group Attending but Not Completing Graduate School.

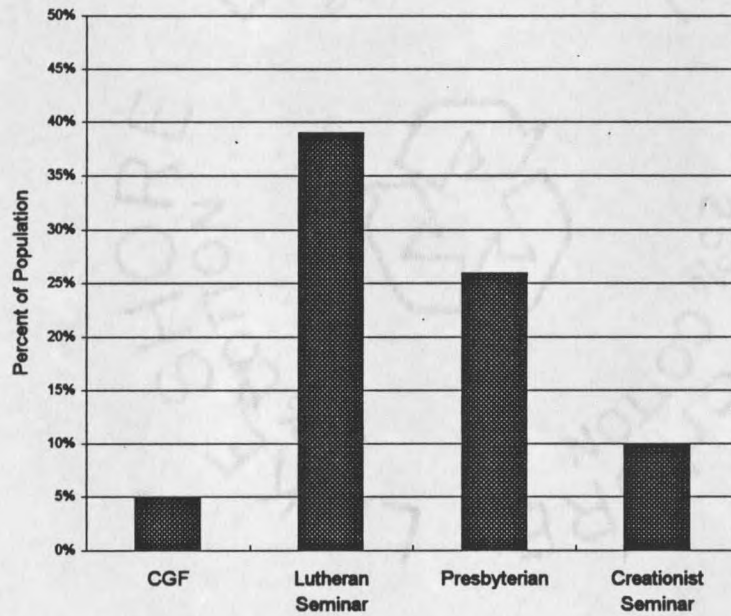


Figure 4. Percent of Each Group Completing a Graduate Degree.

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.















































































































































































































































































































































































































































































































