

Biblical Creationism After a Century of Scientific Investigation

by Ross O. Barnes

During the middle of the last century, as the Seventh-day Adventist Church was developing its emphasis on the creatorship of God, scientists and philosophers were developing the theory of evolution. They merged the evolutionary theories current in philosophical thought since the eighteenth century with a concrete, seemingly plausible, scientific causal mechanism and a naturalistic atheism. The theory of evolution challenged the ancient doctrine that a divine being created the universe. This new threat stimulated Christian apologists to define more clearly the consequences of a belief in God as creator. This effort is commonly called Biblical creationism.

Not surprisingly, the development of creationism has proceeded in several directions, each reflecting different understandings of the Bible. Seventh-day Adventists are among those Christians who have been most comfortable with a literal creationism that treats the Genesis story as a framework account of an actual historical

process, though couched in the language and thought of the ancient world. In this paper, I will review the present status of the apologetic aspects of literal creationism after a century of scientific investigation. I will necessarily make reference to the first nine chapters of Genesis, not simply to the creation stories, since we can investigate the record of creation only through the veil of events that shaped and remolded the surface of the earth during the Biblical Flood.

When evaluating competing theories, it is standard practice to focus on those issues where the theories lead to differing predictions or expectations, and to examine which theory conforms best to presently available observations. Many observations fit equally well or poorly into competing explanatory theories; consideration of such data is of little use in choosing the superior theory even though it forms a necessary part of the complete explication of the theory. For example, the observation that most of the sedimentary rock strata were laid down in or by the action of water has been commonly cited as a major confirmation of the Genesis Flood. However, the predominance of water-laid strata is not a corroboration of any one theory as such, but an obvious condition that any adequate theory must explain. It is a mere consequence of our existence on a planet

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where water is the major agent of erosion and deposition.

I will examine three basic areas that are crucial to evaluating the plausibility of literal creationism after a century of scientific research. These areas are (1) the nature of the process responsible for the present and past distribution of life forms on the earth, (2) the nature of the process responsible for creating the earth's present surface features — seas, sediments, mountains, etc., and (3) the length of time involved in the above two processes. These three areas have been the focal points of controversy between literal creationists and secular scientists. The general positions of their opposing models in these three areas are contrasted in the accompanying box.

Now I shall briefly examine some critical evidence that bears directly on the divergences of these two models.

Scientists have shown that biological systems from the ecological to the molecular level depend on a delicate balance from complex structures, mechanisms and interrelationships. Evolutionary biologists have found it difficult, and in many cases impossible, to satisfactorily explain the evolutionary development of many of these complex and delicate systems.¹

It is difficult, for example, to conceive of the development of new or functionally different organs or structural features by slow gradual stages due to selective advantage.

Literal Creationist Model

- I. **Life.** All living and fossil life forms can be grouped into natural categories that correspond with the created kinds described in Genesis 1. Variability in time and space, adaptation or even the development of genetic incompatibility may occur within these groups. However, the groups maintain their distinctiveness from one another in time and space, due probably to inherent biological, biochemical and physiological factors.
- II. **Geological record.** The historical clues left in the earth provide evidence of a major cataclysm in the earth's past that completely changed the earth's surface — the causal agents being an overwhelming flood, violent volcanism, rapid crustal deformation, etc.
- III. **Time.** The available historical clues should indicate that the appearance and history of life and the deposition of the rock strata that enclose their fossil remains are relatively recent events, on the order of thousands of years.

Standard Secular Model

- I. **Life.** All life forms, past and present, originated, at most, from a few relatively simple types through a process of gradual differentiation and development. The fossil record of life provides a history of this process showing how the various floral and faunal groups developed through successive gradual stages. Although certain intermediate types may not be presently living, they once existed and a significant number should be found as fossils at least in those groups of flora and fauna well represented by fossil forms.
- II. **Geological Record.** The sedimentary strata reveal a series of floral and faunal communities that lived on the earth over a period of time. Each successive community was built on the sediment that buried the earlier community.
- III. **Time.** The historical clues concerning duration of these events suggest that the history of life on earth and the creation of the earth's present crustal features required a very long time period, on the order of millions/billions of years.

Several illustrations commonly cited include feathers, eyes, divergent biochemical systems and the evolution of metamorphosing developmental sequences.

Another problem concerns the common selective disadvantage of significantly large mutations. Most mutations that structurally or functionally modify an organism in ways potentially useful to the evolutionary hypothesis have widespread systematic effects that ultimately endanger an organism's survival. This is in direct contrast to what the evolutionary hypothesis requires.

Still another problem concerns the limits to adaptive change. All well-documented evidence concerning the changes organisms undergo in response to both natural and artificial selective pressures only shows the ability of a population to adapt to a changing environment. Selective breeding experiments have also demonstrated that definite limits exist beyond which adaptive change

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does not occur.² All well-documented or accepted examples of natural adaptive radiation of species — for instance, the occurrences on isolated islands (Galapagos finches, Hawaiian honeycreepers)—involve no more basic variation of the original parent stock than has been achieved through the efforts of human breeders on such domesticated animals as dogs.³

Thus, biology has been unable to demonstrate the probable mechanism or even plausibility of evolution between major groups (macroevolution).

Since, however, evolution is a historical process, its success as an explanation for the origin of life forms stands or falls on its con-

firmation or refutation from the actual historical record of life. If macroevolution has occurred, its general progression should be relatively easy to outline, for the preserved record of life (fossils), however fragmentary and limited, provides a wealth of information about many major floras and faunas. We find, however, that the task of tracing supposed macroevolutionary lineages has progressed not at all in the past 100 years. There seem to be no good clues to the evolutionary relationships of the major groups (phyla) of the animal and plant kingdoms. A similar situation generally exists for the major subdivisions of these phyla. No commonly accepted or even reasonably probable scheme of macroevolution has been worked out. New major types of flora or fauna frequently appear at some point in the stratigraphic succession with no apparent relationship to forms previously present.

In recognition of this situation, a number of modern paleontologists are discarding those evolutionary “family” trees that have been familiar pictorial devices of paleontological literature.⁴

Even Charles Darwin realized that his theory lacked support from the fossil record; he appealed to modern examples of microevolution.⁵ Since then, biological studies have done little to resolve the problem that the intractable fossil record has posed for evolutionists. If one ignores the philosophical and antitheistic factors that make the macroevolutionary theory attractive to some scientists, it is hard to explain the continued dominance among scientists of a theory that has provided so little concrete assistance in explaining the observed history of life.

On the other hand, the fossil record provides little support for literal creationism, except as negative evidence — the lack of expected support for the evolutionary model. Literal creationists have not readily grasped this situation. If the fossil record is largely a result of the Flood, then the buried remains represent a cross-section of life as it existed just prior to the Flood. The noncontinuity of fossil life forms has no positive significance for literal creationism since one does not expect a continuity of forms to exist on the earth at any one instant in time.

During the formative years of the earth sciences in the 1800s, there was no reliable method of establishing the absolute age of a geological event. Geologists concentrated on determining the relative age or order of rock formation from simple physical relationships and by a procedure known as biostratigraphic correlation. An example of a physical relationship is the intuitive “Law of Superposition” which says that a sedimentary rock formation lying on top of another formation was deposited after the underlying formation unless there is contrary evidence.

Because physical relationships are of little or no use in correlating rocks from widely separated areas, biostratigraphic correlation became the predominant method of assigning relative ages or formation times to sedimentary rock strata. This technique uses “index or guide” fossils (limited to specific intervals of strata) to classify the sedimentary rocks into a relative time sequence.

There is a common misconception in creationist circles that biostratigraphic correlation derives its validity from the evolutionary theory. In fact, the technique originated in the early 1800s about 50 years before Darwin published his *Origin of Species*. William Smith, an English civil engineer, observed that the successive rock layers in the part of England known to him contained distinctly different fossil types.

Biostratigraphic correlation is conceptually and operationally similar to the archaeologists’ use of artifacts, particularly pottery, in assigning archaeological strata to various time periods. Index fossils are chosen on an empirical basis (does the system work and is it internally and externally consistent?).

Literal creationist apologists spearheaded in the 1900s by George McCready Price, attempted to discredit biostratigraphic correlation by emphasizing the circularity of the reasoning employed, the lack of an external standard of comparison and (incorrectly) the dependence on evolution for its validity. In emphasizing the definite limitations of the technique, they overlooked the system of checks and balances (internal and external) designed to make the system self-correcting

with time. Most active Adventist creationists have come to recognize that there exists a definite worldwide order to the rock strata and that the observations originally made by William Smith are essentially correct (see discussion below on ecological zonation).

With the discovery of radioactive decay and its inherently stable rate under normal environmental conditions, physicists and geologists recognized the possibility, at least in theory, of measuring the absolute age of geological events and providing an independent standard against which the old relative correlation methods could be compared.

Several recent publications have reviewed radiometric dating methods from a creationist perspective and concluded that the methods yield apparently reliable and consistent ages when utilized properly.⁶ If we assume that decay rates are invariant, these ages range into the millions and billions of years. What events in the history of rocks and their mineral substance do these ages date? Can the ages be related to the deposition time of fossiliferous strata?

Fossils themselves are rarely dated and minerals from the enclosing sedimentary strata are rarely suitable for age determinations. Some way must be found to relate radiometric ages of minerals and rocks, quite often of a molten or high temperature origin (igneous and volcanic rocks) to the age of deposition of the fossiliferous strata.

Simple physical and structural relationships can be used to determine the relative formation time of radiometrically dated rocks and nearby fossiliferous strata. For example, see the “Law of Superposition” above. Geochronologists search for locations where fossiliferous rocks of interest are closely bracketed structurally by radiometrically datable rocks. This physical correlation of radiometric dates with fossiliferous strata has generally validated the relative depositional sequence previously worked out by biostratigraphic and physical correlation, thus lending credence to the usefulness of both techniques. Figure 1 shows the system of rock classification with the generally accepted radiometric ages in the right-hand column. In fact, where geological conditions are favorable and extensive dating has been

done, the time scale can be much more detailed than Figure 1.⁷

The most common and potentially serious creationist criticism leveled at radiometric dating concerns the supposed inability to determine how much radiogenic daughter element was present at a particular time in a rock's history and, therefore, how much is due to parent element decay since that time.⁸ The latter quantity is needed to calculate a radiometric age. The authors of such criticisms are unaware of, or ignore the fact, that whenever possible, the age-dating techniques are designed to answer this question from experimental data, not guesswork. I would suggest that technically capable and interested readers who have been confused on this matter familiarize themselves with the actual methods used by geochronologists. Several recent books that make good starting points are listed at the end of this paper.⁹ The author recently discussed these criticisms before a large audience of Adventist scientists and showed that they could not be substantiated by a careful examination of available literature.¹⁰

Dating techniques are available in which any real or presumed problems of "excess daughter element" are greatly reduced or

eliminated. Although limited by appropriate occurrences, dating of minerals formed directly in fossiliferous sediments during or after deposition has correlated remarkably well with the age scale developed by more conventional dating of igneous and volcanic rock formations.¹¹ The recently developed fission track dating method has no inherent excess daughter problem. In fact, the most serious problem would lead to ages too low rather than too high. However, the agreement between these new dates and the previously developed time scale is again very good.¹² Hobblit and Larson (1975)¹³ provide a not untypical example of the agreement achieved in combining physical and biostratigraphic correlation with a variety of radiometric dating methods performed by a number of different persons.

There is a current tendency in Adventist creationist circles to accept the evidence of internal and external consistency in radiometric dating and even the assumption of invariant decay rate, but to assign the measured ages to inorganic matter created during the initial creation as described in Genesis 1:1. This accommodation, of course, relies on the so-called "gap theory" that assigns the original creation of matter and energy to Genesis 1:1 and then a recent ordering of this initial creation during the events de-

Figure 1. Typical classification by contemporary geologists. After Faul.¹⁷

Era	System or Period	Series or Epoch	Estimated Radiometric Ages of Time Boundaries in Millions of Years*
Cenozoic	Quaternary	Recent	
		Pleistocene	2±1
	Tertiary	Pliocene	7±1
		Miocene	26±1
		Oligocene	38±2
		Eocene	55±2
Mesozoic	Cretaceous	Paleocene	65±2
		Jurassic	135±5
		Triassic	190±5
Carboniferous	Paleozoic	Triassic	225±5
		Permian	270±5
		Pennsylvanian	320±10
		Mississippian	340±10
		Devonian	400±10
		Silurian	430±10
Precambrian	Precambrian	Ordovician	500 (?)
		Cambrian	600 (?)

scribed in Genesis 1:2ff. I cannot comment on the exegetical arguments advanced for this theory. However, the use of the gap theory as a means of accommodating radiometric dating to a short geological time scale does not appear to be defensible upon careful examination of actual dating procedures and results and of the structural, physical and chemical principles of rock formation. I do

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not know of any valid and consistent interpretation of available evidence that allows us to make this general separation between a properly determined radiometric age and the formation time of a sedimentary rock, and the burial of its enclosed fossil remains. If a close and detailed examination of this question substantiates this conclusion, those who have followed the “gap theory” of accommodation will be in a predicament. I think that the most consistent and sound theological and scientific position is to question the validity of radiometric dating, especially the assumption of invariant decay rates, in principle, if the earth has recently experienced a cosmic catastrophe called the flood. This position, of course, negates the present possibility of scientific verification since the evidence suggests that radiometric dating is a valid procedure.

We may now turn to the evidence concerning the nature of the major process(es) responsible for depositing the sedimentary rocks found in the crust of the earth. The most plausible current literal creationist model is the “Ecological Zonation Theory.”¹⁴ In brief, it states that a major portion of the sedimentary rocks (with their enclosed fossils) represents the sequence in

which floral and faunal communities living at higher and higher elevations were buried by the rising Flood waters. These waters are presumed to have covered the highest mountains — though not necessarily to have risen as high as our present mountains.¹⁵

According to this theory, the observed fossil remains that were buried during the Flood represent, in general, a cross-section of plants and animals living at one time before the flood rather than the record of communities that succeeded one another on the surface of the earth over a long period of time. Differences among flora and fauna in the fossil record are due to geographical variations, not evolutionary development in time, thus the name “Ecological Zonation Theory.” Moreover, if the theory is to have any interpretive validity, the various altitudinal zones must have been disturbed and buried more or less simultaneously worldwide and in the same original successive order everywhere. One would expect, on the basis of the ecological zonation theory, that all deposits representing habitats at or near the pre-Flood sea level would occupy approximately the same position in the worldwide sequence of sedimentary rocks and that higher terrestrial zones would dominate above that level.

The standard secular model, on the other hand, suggests that differences in the fossil record are the result of evolutionary changes with time as well as geographical variations. In other words, the sequence represents the entombment of successive communities of organisms — one period of life living on top of the remains of previous periods of life.

I do not think that one has to resort to mountains of complex and obscure data to evaluate the general plausibility of the above models. As in the case of special creation versus evolution, the broad aspects of the geological data serve to support one or the other of the two explanations.

I will attempt to answer in a general fashion two basic questions that emphasize the divergences of literal creationism and standard geological thought. (1) Can the observed sequence of fossil deposits be rationally explained in terms of geographic and ecological variations as predicted by “ecolog-

ical zonation” or does the sequence show progressive changes in floral and faunal types with no definite ecological zonation as predicted by the standard geological model? (2) Do the apparent source areas of sediments seem to fit the ecological zonation model of antediluvian land masses being eroded to higher and higher levels (general source area relatively stationary during deposition of sediments)? Or do the sites of erosion and deposition vary or possibly reverse during a depositional sequence as allowed by standard secular theory?

The best way to approach these questions is to examine the general nature and relationships of sedimentary strata in some large area where these relationships are simple enough to be compassed in a brief presentation. I have chosen the United States between the Appalachian and Sierra Nevada mountains because the structural geology of this region is relatively simple. I will briefly summarize some of the characteristics of the sedimentary sequences in this area that are relevant to our question.¹⁶

The lower Paleozoic rocks of this region are almost all of shallow water marine origin with a large proportion consisting of carbonates (limestone).^{*} Carbonate rocks represent the accumulated remains of aquatic organisms with carbonate skeletal structures or shells (corals, molluscs, etc.) and/or carbonate removed from waters supersaturated with carbonate minerals. When these rocks were formed, there was apparently no significant land mass in this whole large region.

The upper Paleozoic deposits covering large areas of the central U.S. consist of alternating layers of marine limestone with shallow water fossils, marine and fresh water clays, well-sorted sands and coal beds with vegetation probably derived from low, often swampy forests. Rocks later than Pennsylvanian are essentially absent from the northeast and northcentral part of the U.S. Apparently, this area has been above sea level ever since and subject to continual but not intense erosion.

^{*}When rock strata are called marine or continental, or shallow water, one usually refers to the presumed habitat of the fossils found in the rocks.

Deposition of marine strata continued, however, across the area now called the Great Plains and westward. Rocks next deposited in this region (Lower Mesozoic) generally show the marine strata receding to the west in a belt through Nevada, Utah and Idaho. In the Rocky Mountain region, these deposits are largely derived from land masses rather than marine waters with large sandstone deposits, especially in the southern part of this area. In upper Mesozoic rocks, alternations of marine and nonmarine strata predominate in this region. The Cretaceous strata show such alternations, with coal beds in some respects similar to the Pennsylvanian strata of the eastern and central U.S., except that the fossil types are distinctly different.

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The end of the Mesozoic essentially marks the end of deposition of strata of marine origin in the western interior U.S. (bounded by the Sierra Nevadas and the Mississippi). Whereas marine waters retreated from the East and Midwest in the late Paleozoic, they were present in the western interior until the end of Mesozoic deposition. At the end of Mesozoic sedimentation, this generally flat country was uplifted, folded and faulted with the formation of the Rocky Mountains. The uplifted areas were subject to relatively rapid erosion. The strata resulting from this erosion contain mammal and land plant fossils and are deposited in a wedge to the east of the mountains and in structural basins within the mountain belt itself.

Sedimentation along the Gulf Coastal Plain followed a somewhat different course than that of the Great Plains and western

regions after the late Paleozoic uplift of the eastern U.S. Sedimentation here exhibits an alternation of shallow water marine deposits and low-coastal-plain, nonmarine deposits suggesting an oscillation of sea level that alternately flooded and exposed this region. Such a depositional environment has apparently continued to the present day.

Based on these data, we can conclude the following: (1) Rocks of shallow marine origin are found from the top to the bottom of the sedimentary section. These shallow water rocks contain fossils of apparently similar habitat (ecology). However, the characteristic fossil forms definitely change as one proceeds from top to bottom. All of these rocks, representing similar source area and depositional environments, can be successfully classified into the sequence of rock systems of Figure 1 by biostratigraphic correlation techniques. (2) Except for the lowermost Paleozoic, nonmarine rocks are also present throughout the section again with characteristic fossil forms changing from top to bottom. (3) The sedimentary and fossil characteristics of the Cenozoic continental strata of the Rocky Mountain region suggest predominately local source areas for both sediment and fossil remains. However, these local source areas do not appear to be enduring antediluvial highlands reached by Flood waters during the latter stages of the Flood. As already mentioned, these local source areas were being covered with marine strata until shortly before the Rocky Mountain uplift — a very unlikely refuge area for antediluvial land animals and plants. (4) The fossiliferous strata in this large area covering most of the U.S. do not appear to be zoned ecologically but taxonomically. In other words, similar ecologies are found throughout the section but the characteristic fossil forms change from top to bottom — i.e., (1) and (2) above. (5) The distribution of these fossiliferous strata seems to show successive life communities inhabiting the same general area in temporal succession — i.e., (3) above.

Returning to our original two questions, the reader should note that the above observations accord with the predictions of the standard geological model rather than ecological zonation theory. This poor fit of

theory with some obvious and general features of the sedimentary record suggests that “ecological zonation” may be a poor starting point for developing a more detailed geological Flood model.

In summary, the Biblical concept of special creation of life can be defended, with no apology, from scientific data. However, as presently conceived, critical historical predictions or consequences of a literal creationist model do not accord with the more obvious and general features of the physical geology of our planet. In other words, we have no viable “Flood model” or apparently even beginnings of a model after many years of effort by a number of creationists.

As a result, the task of trying to harmonize Genesis and geology may be akin to generating scientific models and attempting to demonstrate the scientific plausibility of Joshua’s long day or the virgin birth. Most of us realize that such attempts are theologically worthless and scientifically futile since these events are commonly conceded to fall in that ill-defined category of “miraculous,” not of the ordinary course of nature. Furthermore, we have precious little, if any, concrete evidence or physical artifacts remaining from these events that could verify or refute our proposed models.

It is commonly conceded in conservative Christian circles that the Noachian Flood must also have been an event of a miraculous nature. Perhaps it is the abundant wealth of potential physical artifacts (the whole surface of the earth) that tempts us to believe we can understand and rationally investigate the inner workings of a miracle. Our demonstrable successes in the area of special creation mainly involve evidence related to the inherent nature of the creation rather than detailed historical events. It is exactly these types of relationships that are likely to be discernible through the veil of the extraordinary occurrence, whereas detailed causal relationships are hopelessly obscured. Romans 1:20 says that it is the “invisible nature of God, namely, His eternal power and deity” that is clearly perceived in the creation, not the de-

tailed record of His historical interaction with it. The latter is the subject matter of His special revelation in the Bible.

Science provides us with a mystery concerning the origin of life forms. As Christians, we perceive this as an expression of God's creative acts and fill in the gaps, so to speak, with creative events. The secular evolutionist, lacking such an alternative, fills in the gaps with his evolutionary theory. Science also provides a seemingly airtight causal description of the earth's history that finds no evidence for universal floods, long days or virgin births. Should we adopt a similar perspective on all three of these miracles or should we feel that the universal flood is somehow more amenable to scientific analysis?

For completeness, I must raise another question. Do we correctly understand the Bible's message concerning the earth's history? This is not a popular question, but if we fail to ask it, we can be justly accused of believing that we have the final word on Biblical interpretation. In fact, if we honestly insist that the Biblical record of earth's physical history be demonstrated to be in plausible accord with the "facts of science," a re-analysis of our Biblical interpretations is probably inevitable, for the literal creationist model presently leads to an inconsistent stance towards the "facts of science" and I see no indications that this situation will improve in the near future.

There are two important considerations that should shape an evangelical or theological stance toward creation research: (1) the

position should be consistent with the Biblical revelation; (2) it should not unduly hamper responsible research efforts to solve problems that arise as a result of creation research. These considerations suggest that we should emphasize those positive points — evidences for creation of life, design in nature, etc. — without tying them to a defense of Flood geology, a defense that is presently inconsistent in its use of scientific data. This inconsistency is evident to knowledgeable persons and can only detract from the value of our positive contributions. We can emphasize the miraculous nature of the Biblical Flood and our reservation at being able to demonstrate its congruence with scientific facts. At the same time, we recognize that this position is not ideal and we are exploring various alternatives. Too often, we feel obliged to evangelize a particular accommodation of scientific evidence with the Biblical account. When it becomes necessary to revise or discard these accommodations, much confusion arises and various people appear to be working at cross-purposes. If, instead, we maintain a more consistently defensible interim position, then we can leave the field of possible accommodations relatively unrestricted as it should be.

Well-intentioned persons have been asking creationist geologists for scientific models that support literal creationism. Scientists should not mislead them by concealing the great problems that presently confront such an effort. I hope that they realize that the scientist's task may prove impossible due to the inherent nature of the problem.

NOTES AND REFERENCES*

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*An illustrated and expanded version of this paper was presented at a Walla Walla College faculty colloquium May 1975.

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10. Ross O. Barnes, "An Evaluation of the Geological

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11. Dalrymple and Lanphere, p. 174.

12. R. L. Fleischer, P. B. Price and R. M. Walker, *Nuclear Tracks in Solids: Principles and Applications* (Berkeley: University of California Press, 1975), p. 167.

13. R. Hoblitt and E. Larson, "Paleomagnetic and Geochronologic Data Bearing on the Structural Evolution of the Northeastern Margin of the Front Range, Colorado," *Bulletin of the Geological Society of America*, 86 (1975), 237-242.

14. A recent succinct statement of this theory can be found in Coffin, pp. 174-183.

15. The equitable antediluvian climate as usually conceived suggests the existence of a generally lower topographic relief.

16. Illustrations of the geographic distribution of the rock systems can be found in Raymond C. Moore, *Introduction to Historical Geology* (New York: McGraw-Hill, 1958); Philip B. King, *The Evolution of North America*, rev. ed. (Princeton: Princeton University Press, 1977), also provides a good introduction to the geology of this area.

17. Henry Faul, pp. 59-61.