The Nineteenth Century Engagement Between Geological and Adventist Thought and its Bearing on the Twentieth Century Flood Geology Movement

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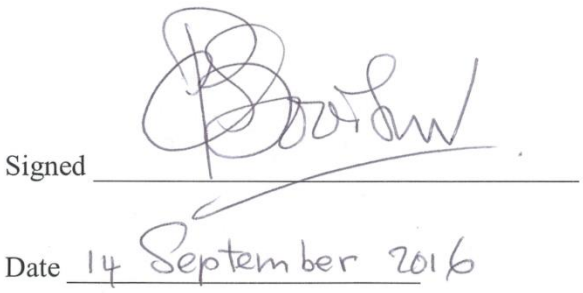
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Statement of Original Authorship

I declare that the work contained in this thesis has not been submitted previously for a degree or diploma at this institution, an Australian or overseas university or any other institution of higher education. To the best of my knowledge and belief, this thesis contains no material previously published or written by another person except where due reference is made.

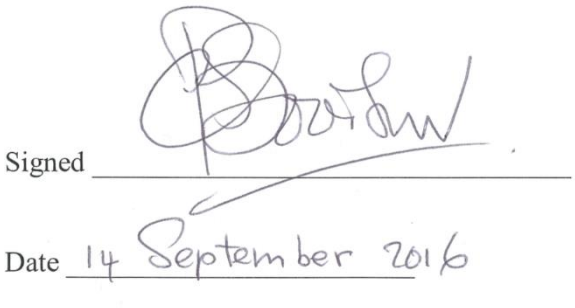


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Dedication

This thesis is dedicated to Dr Arthur N. Patrick (1934-2013). I met Dr Patrick in February 2009 during the Science and Faith Conference at Avondale College of Higher Education. Circumstances put me in the seat next to him and the casual encounter quickly developed into a proposal for this research where he became one of my supervisors. His impeccable intellectual integrity, research skills, and knowledge of Adventist history have been a great inspiration to finish this thesis. Unfortunately, he passed away too early to see this work completed.

Abstract

The Seventh-day Adventist Church has from the early years of its existence reacted to the perceived challenge of geological thought to their nascent theology. In particular, the Sabbath of the fourth Commandment in Genesis 2 and the catastrophic global Flood described in Genesis 7 and 8 were targeted. The nineteenth century Adventist response has been one of shifting focus, changing strategies, and increasing intensity. Ellen White, the church's co-founder and prophetess, was one of the first to sound a warning on theological implications of geology. Her perception of geology contained many pre-nineteenth century concepts disconnected from contemporary geological thinking. Long-time editor Uriah Smith used external documents, notably Presbyterian writings to guide the Adventist congregation with ways of responding to geological thought as it impacted on their faith. The first authentic Adventist evaluation of geology and its perceived link with evolution by Alonzo Jones took place in the mid-1880s. With his spirited response, Jones criticised geological stratigraphic concepts in order to neutralise the threat of burgeoning theistic evolutionary thought. His searching in the geological literature involved the use of contextomy. George McCready Price next ventured to nullify the established stratigraphic principles of geology in order to justify a single, global flood-based hypothesis to explain all fossiliferous sedimentary formations. To achieve this, he presented from established scientists selected citations out of their intended context. A special case is presented on Price's questionable use of the reports of American field geologists McConnell and Willis on thrust faults in the Rocky Mountains. Price modified diagrams and failed to convey unmistakable evidence of a dynamic cause of complex stratigraphy to present his case for the global existence of reverse sequences of rock strata. He argued that since the geologists' evidence for a fossil sequence of life in the rock stratigraphy is so greatly flawed, there must have been a single catastrophic event that better explained this. Adventist engagement with geological thought during this period saw a noticeable increase in the disregard of intellectual integrity. This study argues that intellectual dishonesty is not a valid way to support a preconceived interpretation of the scriptural narrative. History provides several examples where skewed accounts of events due to questionable intellectual sincerity have eventually been corrected. This research provides access points for interested persons to further investigate the historical aspects of the nineteenth century geology and Adventist thought engagement.

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Glossary

Adventism. A branch of Protestantism which believes in the imminent Second Advent (Return) of Jesus Christ. This branch originated in the nineteenth century Protestant revival which was known in America as the Second Great Revival.

Catastrophism. A theory that the Earth has been affected by sudden, short-lived, violent events that possibly were worldwide in scope.

Conformable geological contact. Contacts between rock layers that indicate the absence of significant time gaps or breaks in deposition.

Contemporaneity. The state of being contemporaneous. The condition where rock formations in different locations have formed in the same period of time.

Contextomy. The practice of selective usage of words out of their original linguistic context in a way that distorts the source's intended meaning and is intended to prompt audiences to form a false impression of the source's intention.

Cordillera. An extensive chain of mountains or mountain ranges (e.g. North American Cordillera or Canadian Cordillera).

Homotaxis. A similarity in the arrangement of rock layers (strata) that occurs in the same relative position but are not necessarily contemporaneous.

Paraconformity. A type of unconformity where sedimentary strata are parallel but parts of the geologic column are missing without obvious signs of erosion. The missing strata are however present in the geological column in other parts of the world.

Seventh-day Adventism. A Protestant Christian denomination distinguished by its Saturday (seventh-day) observance of the Sabbath and its emphasis on the imminent Second Advent (Return) of Jesus Christ.

Stratigraphy. The branch of geology that seeks to understand the relationship between different rock layers (strata) from one area to another and to interpret the history represented by these rock layers.

Thrust fault or Overthrust. A major low-angle fault in which rocks of a lower stratigraphic position have been pushed up and over rocks of a higher stratigraphic position. Such faults are due to compressional forces and result in regional shortening of the earth's crust.

Unconformity. The situation where contacts or surfaces between rock layers represent a gap in the geological record due to erosion and/or non-deposition.

Uniformitarianism. The hypothesis that geological formations in the past have been formed by processes similar to the ones that are operating now. Opinions on the rate of the processes have differed.

Chapter 1

Introduction

> Both science and religion are part of the great human quest for truthful understanding . . . both are seeking truth through the attainment of well-motivated beliefs.
>
> —John Polkinghorne, *Science and Religion in Quest of Truth*

> Jesus answered, "I am the way and the truth and the life."
>
> —John 14:6 (NIV)

> Science is but an image of the truth.
>
> —Francis Bacon cited in: James Wood, *Dictionary of Quotations from Ancient and Modern, English and Foreign Sources.*

> We [geologists] are like a judge confronted by a defendant who declines to answer, and we must determine the truth from the circumstantial evidence.
>
> Alfred Wegener, *The Origin of Continents and Oceans*

1.1 A Denominational Context

The engagement of geological thought and Adventism is inextricably linked with the Seventh-day Adventist Church's orthodox belief in the Mosaic Creation narrative. The Seventh-day Adventist denomination has from its very beginning emphasised the importance of the Creation account of Genesis 1:1-2:3 in its theology. Indeed, the recognition of the importance of the Creation forms the foundation for their weekly celebration of the Saturday Sabbath. Despite the importance that was attached to the Creation account, it was, however, not until 1980 that an official statement of belief on creation was added to other, much earlier published, fundamental beliefs. Other statements of the Church's beliefs had, for example, already been published as "Fundamental Principles" in the *Signs of the Times* on June 4, 1874, and again in the *Review and Herald* on August 22, 1912.[1] The first official statement on Creation (Fundamental Belief 6) was approved only on April 25, 1980, by the General Conference of the Seventh-day Adventist Church.[2]

Thirty years later, in 2010, Ted N. C. Wilson, the then newly elected president of the Seventh-day Adventist Church, unexpectedly brought forward the "Reaffirmation of

1. Sergio Silva, "The Development of Fundamental Belief Number 6," *Perspective Digest* 17, no. 1, http:perspectivedigest.org (accessed July 11, 2016).

2. In 2005 a 28th fundamental belief was added.

Creation" motion, dealing with Genesis 1-11, to the floor of the General Conference.[3] The main reason for this motion was that it was felt that there was a lack of specificity in Fundamental Belief 6 which allowed for a number of mutually exclusive views. The president's 'Reaffirmation' motion sought to remove such mutual exclusivity and instead to affirm a stronger historic, biblical position of belief in a literal, recent, six-day Creation. As a result, the updated Fundamental Belief 6, was approved during the 2015 General Conference session in San Antonio, Texas. The 2015 edition contains, among other changes, the added word "recent" to describe *when* the Earth was created, and the added phrase, "six literal days", to clarify the *length* of the Creation (see table 1.1).

Table 1.1. Comparison of Seventh-day Adventist Fundamental Belief number six between 1980 and 2015

Fundamental Belief 6, 1980 edition.	**Fundamental Belief 6, 2015 edition.**
That God, through Christ and by the power of His Spirit, is creator of all things, and has revealed in Scripture the only authentic account of His Creative activity. In six days the Lord made 'the heavens and the earth' and all living things upon the earth, and rested on the seventh day of that first week. Thus he established the Sabbath as a perpetual memorial of his completed creative work. The first man and woman were made in the image of God as the crowning work of Creation, given dominion over the world, and charged with responsibility to care for it. When the world was finished it was 'very good,' declaring the glory of God. (Gen. 1-3; Exod. 20:8-11; Ps. 19:1-6; John 1:1-3; Col. 1:16, 17.)[4]	God has revealed in scripture the authentic and historical account of His creative activity. He created the universe, and in a **recent** six-day creation the Lord made "the heavens and the earth, the sea, and all that is in them" and rested on the seventh day. Thus He established the Sabbath as a perpetual memorial of the work He performed and completed during **six literal days** that together with the Sabbath constituted the same unit of time we call a week today. The first man and woman were made in the image of God as the crowning work of Creation, given dominion over the world, and charged with responsibility to care for it. When the world was finished it was "very good," declaring the glory of God. (Gen. 1-2; 5; 11; Exod. 20:8-11; Ps. 19:1-6; 33:6, 9; 104; Isa. 45:12, 18; Acts 17:24; Col. 1:16; Heb. 1:2; 11:33; Rev. 10:6; 14:7.)[5]

1.2 Benefiting from Tension

Since professional geologists apply an old age timescale for the history of the earth, Seventh-day Adventist believers may experience a tension between working with the conventional geological timescale against the background of the new wording of Fundamental Belief 6. Bringing the topic of geology into a conversation among Adventist

3. See Silva, "The Development of Fundamental Belief Number 6."

4. "Fundamental Beliefs of Seventh-day Adventists," *Adventist Review* 157, no. 8 (February 21, 1980): 192.

5. General Conference of Seventh-day Adventist, "28 Fundamental Beliefs" 2015 Edition, http:// Adventist.org (accessed July 11, 2016). Major changes in bold font.

believers can become a reason for misunderstanding because it is potentially loaded with conflicting presuppositions. A discussion of the historical interaction between geological thought and Seventh-day Adventist belief can, therefore, unfortunately be fraught with astigmatism, skepticism or even suspicion. Such reactions have deep roots and go back to historical statements that Ellen White, one of the three founders of the Seventh-day Adventist Church, made as early as 1864.

Opening the recently published devotional calendar, *To be Like Jesus*, with readings selected from a wide range of Ellen White articles prepared by the Ellen G. White Estate, could for non-Adventists possibly bring tensions to the surface. For example, the devotional reading for May 23rd, "The Sabbath Reminds Us of God's Creative Power," contains such a potential source of tension. It opens with, "Infidel geologists claim that the world is very much older than the Bible record makes it," and somewhat further states, "Without Bible history, geology can prove nothing."[6] Many, if not most, Adventists, as guided by their presuppositions, would probably accept this statement without a second thought. However, the first two words 'infidel geologists', together with the other statements, could trigger a reaction of disbelief from, for example, professional geologists or, in general, from people, including faithful believers, with a passion for geology. The tension created by Ellen White's geological statements is caused by unfamiliarity with nineteenth century history of geology, scientific methodology and theology among both orthodox Christians and professional geologists. This research was stimulated by a scenario similar to that sketched above.

There are, however, ways of dealing with the outlined tension and maintaining or even growing one's faith. The engagement between geological and Adventist thought can benefit from a deeper understanding of its nineteenth century context. Such a greater understanding can encourage a more meaningful dialogue between groups that look from various angles at this topic. For Adventists, a knowledge of the historical context of the engagement could prevent an overhasty reaction towards present challenging statements from the science of geology. Non-Adventist geologists could benefit from better understanding the reasons for the reaction by the nineteenth century church elders towards this then little understood science.

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6. The Ellen G. White Estate, *To be like Jesus: Ellen G. White Daily Devotionals* (Hagerstown, MD: Review and Herald Publishing Association, 2004), 154; The May 23rd reading comes from: Ellen White, *Spiritual Gifts*, vol. 3 (Battle Creek, MI: Seventh-Day Adventist, 1864), 91-2.

1.3 The Rationale for the Study

The rationale for this thesis is to fill a gap in earlier studies on the interaction between Adventism and geology. None of the earlier investigations have seriously considered the intrinsic geological aspects of the interaction. This study purposes to investigate the context of nineteenth century geological and Adventist thought, to evaluate the level of understanding of contemporary geological thinking by the Adventist elders, and their efficiency in conveying this understanding to the lay congregation. Furthermore, the study has as its purpose to provide access points for people struggling to understand the historical context of this fascinating engagement.

The thesis aims to provide a pathway for people to become more cognisant of the development of geological thinking in the nineteenth century and in the face of perceived tensions in this process to maintain or even grow one's faith. It is argued here that a combined and harmonious understanding of nature and scripture can lead to a better understanding of nature and its relationship with God as Creator. Talking about Adventism and geology need not cause any uneasiness but should lead to a greater appreciation of God and his plan for humankind. John Polkinghorne suggests that in a situation like this, having one eye on science [including geology] and another eye on religion, and believing that both are congruent, can enable a person to see *further and deeper* than with either eye on its own.[7] Having one eye on the rocks in nature and the other on Scripture can, indeed, provide *stereoscopic* vision with considerably greater depth, clarity and, sense of reality.[8]

This research is not about establishing who or what is right or wrong, but about becoming cognisant of what actually happened in the thought-provoking period from 1850 to 1923, and what we can learn from it. 1850 was chosen as an arbitrary starting date because it marked the start of the church magazine, the *Second Advent Review, and Sabbath Herald*,[9] which would share Adventist doctrine with an ever-growing community of believers. The periodical would with great regularity pay attention to the perceived threat of theoretical

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7. See John Polkinghorne, "The Friendship of Science and Religion," *Cathedral Age* (Autumn 2012): 11. (10-40)

8. Students of geology, geomorphology and physical geography traditionally spend many hours in preparation for a field study scanning aerial photographs underneath a stereoscope. Once the photos are aligned correctly for binocular vision one experiences instantly a sensation of depth and clarity that is difficult to describe. Attached lenses for magnification create an even greater dimension of clarity and detail. It is hoped that a study of nineteenth century geological history together with biblical study can provide a similar stereoscopic sensation of God's Creation.

9. The Church periodical would over the years slightly change its name but is in this thesis referred to as the *Review and Herald*.

geology. 1923 was chosen because it marked the date when George McCready Price, the well-known Adventist author of twentieth century geological apologetic literature, published his magnum opus, *The New Geology*.[10]

Tension relating to differing interpretations of topics within Scripture is not novel. There are different ways that Bible verses can be understood. They can be read at a purely literalistic level, a solely allegorical level, or any combination of the two. While tension can easily lead to conflict it can also be used as an opportunity for deeper investigations and robust dialogue on the relationship between geology and Scripture, as in this thesis.

1.4 Aims and Objectives

While it certainly is not the first time that the interaction between geology and Adventism has been a topic of investigation, none of the previous research has examined in-depth the geological issues involved (see chapter 2). *This research aims to fill that gap by examining the nature of the thought engagement between Adventism and geology and the legitimacy of geological statements that were made by Adventist elders in the context of the 1850-1923 period.*

More specifically, the objectives of this research are to investigate how well the elders understood geology as a science and how they communicated their evaluation of geology to the lay congregation. The reporting by the church elders on the influence of geological findings on Adventist belief was not an easy task for a number of reasons. Firstly, both Adventist doctrine and modern geology were in a flux and underwent spectacular development in the nineteenth century and this fact did not assist the communication process. Secondly, geology was a quickly maturing and complex new science that was developing its distinctive pragmatic and hypothetic methodology which departed quite manifestly from the already established sciences such as mathematics and physics. Thirdly, the Adventist responders initially knew little about geology and they did not have an accurate comprehension nor training to understand what it meant to be a geologist. These aims and objectives lead to the central research question: *To what extent did Seventh-day Adventist writers understand the nature and findings of the science of geology in the period 1850-1923 and what was the impact of Adventist belief (as an Orthodox Christian Belief) on this understanding?*

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10. George McCready Price, *The New Geology: A Textbook for Colleges, Normal Schools, and Training Schools; and the General Reader* (Mountain View: CA, Pacific Press Publishing Association, 1923).

The thesis will examine how each of the key role players shown in figure 1.1 contributed to the thought engagement in their own special way and how they might have influenced each other when writing on this issue. The thesis will explore how these key players differed in their focus, the intensity of their involvement, their knowledge of geology and the extent of their impact within and beyond Adventism. The rationale for selecting the four key figures and their involvement in the thought engagement was determined by the strength of their involvement. Four Adventist writers were chosen as a result of preliminary reading of Adventist literature; Ellen White, Uriah Smith, Alonzo Jones, and George McCready Price. Biographies on Ellen White have focused largely on her role as prophet to the church and very little on her reaction to modern geology. Biographies of Uriah Smith and Alonzo Jones make no reference at all to their interests in geological matters. George McCready Price is well known for his writing on geology, but his geological statements have hardly been evaluated against the authors whose works he used. This thesis will therefore explore those gaps in our knowledge of the Adventist authors and will examine to what extent these authors laid a foundation for what was to become the Flood Geology of the twentieth century.

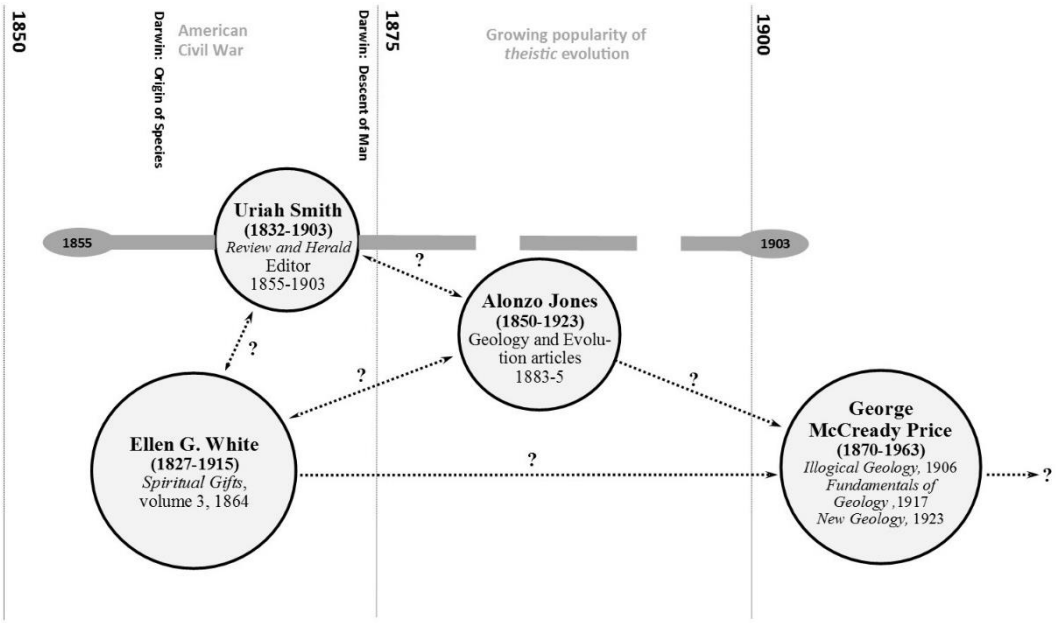


Figure 1.1. Key role players to be researched in this thesis in relation to their interaction with geological ideas from 1850-1923.

1.5 Methodology

The main methodology applied was historical data-gathering and analysis of nineteenth and early twentieth century texts dealing with the Seventh-day Adventist church

and geology. Data was gathered from a variety of sources. Data on the involvement of Adventist authors with geological thought was gathered from online access to periodicals in the Office of Archives, Statistics, and Research of the Seventh-day Adventist Church, books by the key authors, and biographies written on those authors. Periodicals were searched online and selected on the basis of the occurrence of key words such as geology, flood, for example. The two major Adventist periodicals selected were the *Review and Herald* and *The Signs of the Times*. For each 'geological' article in the periodicals, the author; article title; main content; frequency of the use of the 'geology' term; the chief editor; article type; publication date; and volume, number and page number data was collected (see Appendix A for the *Review and Herald*, and Appendix B for *The Signs of the Times*). Secondly, frequencies of the use of the term 'geology' were estimated by year and graphed (see bar graphs in chapter 4 for the *Review and Herald* (fig. 4.2) and in chapter 5 (fig. 5.1) for *The Signs of the Times*). Ellen White was chosen because of her sharp statements regarding geology that carried significant impact based on her charismatic authority within the Adventist church. Uriah Smith stands out because of the longevity of his editorship of the earliest church periodical, the *Review and Herald*. Alonzo Jones and George McCready Price stand out through the frequency of the use of 'geology' terms in their articles in the church magazines.

During the nineteenth century Adventist editors and authors made frequent use of material that originated outside the Adventist church. Where possible, primary sources were selected to analyse the intentions of original authors in articles used in the two church periodicals. Guiding questions related to how geologists saw their science and how the Adventists leaders perceived geology. This involved, firstly, gathering personal data about the writer, the writer's role or position, the intended audience, and what prompted the writer to write. Secondly, besides the rhetorical context there was also the content analysis, what issue was addressed, what position did the writer take, and what claim does the writer make? Finally, the text was placed in a context in relation to other texts.

A small library of geological and theological books on the issue of science and religion and historiography of geology was acquired during the period of thesis study. Many historical texts were read online as scanned original texts via Google Books and the Google Books Library Project. Adventist texts were read via the searchable online archives of the Seventh-day Adventist Office of Archives, Statistics, and Research (ASTR). Additional texts were sourced via, or read at the Avondale College library, the Ellen G. White/SDA Research Centre, and Adventist Heritage Centre at the Avondale College of Higher Education in

Cooranbong, NSW, Australia; The James White Library of Andrews University, Berrien Springs, Michigan, USA; the Adventist General Conference library in Silver Spring, Maryland, USA; and the local Auckland University Library in Auckland, New Zealand.

1.6 Organisation of the Thesis

In chapter 2 the nineteenth century geological and Adventist context for the thought engagement is discussed. It addresses some common misunderstandings within geological circles as well as misconceptions in orthodox Christian communities. In chapters 3 to 5 the roles that key figures in the Adventist faith played in responding to the impact of geological thought on Seventh-day Adventist theology in the nineteenth century are explored. In chapter 3 Ellen White's use of geological concepts in warning the believers of the 'coming conflagration' is investigated. Chapter 4 considers the role of Uriah Smith as Resident Editor of the Review and Herald in steering the discussion on the impacts of modern geological thinking. Chapter 5 investigates Alonzo Jones' position as an important nexus between mid-century reactions to geology and a changing approach to dealing with geological thought towards the end of the century. Chapter 6 examines the early twentieth century continuation of this engagement with its development of a revitalised Flood Geology by George McCready Price. Chapter 7 ties this all together and synthesises the importance of the communicator's role and intellectual integrity in informing the Adventist believers on the potential impact of geological thought on their faith.

Chapter 2

Roots and Rules of the Engagement Process

> You speak of the flimsiness of your own faith. Mine, which was never strong, is beaten into mere gold leaf, and flutters in weak rags from the letter of its old forms; but the only letters it can hold by at all are the old evangelical formulae. If only the geologists would let me alone, I could do very well, but those dreadful hammers! I hear the clink of them at the end of every cadence of the Bible verses.
>
> —John Ruskin, letter to Henry W. Acland, May 24, 1851

> It sounds paradoxical to say that the attainment of scientific truth has been effected, to a great extent, by the help of scientific error.
>
> —Thomas H. Huxley, "The Progress of Science"

> It is the work of true education to develop this power [individuality, power to think and do], to train the youth to be thinkers, and not mere reflectors of other men's thought. Instead of confining their study to that which men have said or written, let students be directed to the sources of truth, to the vast fields opened for research in nature and revelation.
>
> —Ellen G. White, *Education*

2.1 Introduction

The nineteenth century was a stimulating period for the establishment of both geological and Adventist thought. Geology had grown out of pre-nineteenth century natural history to become an independent science as its number of professionals, and its knowledge base increased exponentially. For Seventh-day Adventism, it was an equally formative period due to its emergence from the Millerite millennial movement which followed the Second Great Awakening in the United States of America.[1] The church grew from initially just a handful of people in mid-century to a fully established denomination that by the end of the century had already established itself in several continents beyond North America. Geology and Adventism shared a particular interest in the area of historical geology. Geology had started to develop a historical geology of the Earth by accrued knowledge through field observations of rock strata. For problem solving, geology would increasingly use a multiple working hypotheses approach as guidance for their data collection in the field. Adventism, on

1. The Millerites were the followers of William Miller who in the 1830-1840s preached the imminent Second Advent of Jesus Christ.

the other hand, interpreted its picture of the history of the Earth by its literal interpretation of the Genesis narratives and the use of a naïve Baconian induction-based, anti-theoretical methodology. The engagement of these two mindsets developed because of several important historical events (roots) and according to certain established ways of thinking (rules) surrounding these events. The roots and rules of the engagement form the focus of this chapter and set the scene for a further discussion of the nature of the engagement in this fascinating period.

2.2 The Engagement Context

No interaction occurs independently of a set of special circumstances. This chapter looks at the conditions that facilitated the unique engagement between geology and Adventism. Geological thought had reached a level of some maturity by the time the Seventh-day Adventist Church was establishing its fundamental theological ideas. Their common area of thought centered on the natural history of planet Earth.

The nineteenth century was an era of significant transformation in many aspects of life. Americans were experiencing a "dizzying pace of change" through revolutions in communication and transportation and accelerating economic growth in a tumultuous political environment.[2] A strong general optimism had prevailed following the American Revolutionary War (1775-83) with settlers moving west with an increasing feeling of independence and self-determination during Andrew Jackson's presidency.

This attitude of personal independence in politics extended itself also into religious matters. Democratisation, Nathan Hatch argues, is, therefore, central to understanding the development of American Christianity during the early years of the republic.[3] Ordinary people expressed strong opinions about religious matters and played a significant role in shaping the religious landscape. The first half of the nineteenth century, between the American Revolution (1775-1783) and the Civil War (1861-65), proved to be a bewildering period of social and religious turmoil. Noll notes that after the Revolutionary War, in general, "the churches in the new United States existed in a state of confusing transition."[4] They had

2. Mark A. Noll, foreword to *God's Strange Work: William Miller and the End of the World*, by David L. Rowe (Grand Rapids, MI: William B. Eerdmans, 2008), ix.

3. Nathan O. Hatch, *The Democratisation of American Christianity* (New Haven, CT: Yale University Press, 1989), 3.

4. Mark A. Noll, "Evangelicals, Creation, and Scripture: Legacies from a Long History," *Perspectives on Science and Christian Faith* 63, no. 3 (September 2011): 149.

to cope with a new political reality; "how to carry on religious life without the partnership of the state?"[5]

The tension created by the new political climate in the young republic not only impacted Christian faith *per se* but also influenced the interaction between Christianity and science. Noll highlighted some characteristic elements of this new situation:

- The belief that the best medium for nurturing the Christian faith in a republican and democratic society was provided by churches which were democratically organised and whose membership was voluntary.
- The conviction that the Bible was the primary and unique agent for evangelism, training in godliness, guidance to the churches, and also the construction of social order.
- The belief that the Bible appropriated democratically, and science, also appropriated democratically, were the safest guardians against the perils of infidelity.
- The belief that 'The Bible Only' provided the ideal anchor amidst the tumults of an otherwise unstable world.
- The assumption that the best biblical interpretation was the most literal interpretation as grasped by the most democratic audience of readers.[6]

In short, in the vacuum of well-developed social institutions or government structures characterising the early republic years, the King James Version of the Bible became the replacement for an established universal cultural authority.

2.2.1 An Evolving Philosophy for the Natural Sciences

It has frequently been suggested that there exists a fundamental disjunction between Christian and scientific thinking, especially when it comes to sensitive topics like the age of the earth or the origin of life. However, in the past, the relationship might be better described as symbiotic rather than disjunctive. A brief summary of the development of scientific thought over the last 2000 years follows below.

Early church fathers such as Origen (c.185-c.254) had understood that the scripture had three senses: the *literal,* that is, the obvious or historical sense; the *moral,* giving instruction on how to live; and the *allegorical,* which was to be given preeminence as it pertained to timeless theological truths.[7] For example, while Noah's ark could be thought of in a literal sense, the ark and the flood had deeper theological significance.[8] To the church

5. Ibid.

6. Ibid., 151-3.

7. Origen, *On First Principles*, trans. G. W. Butterworth (Gloucester, MA: Peter Smith, 1973), xxxiii-lxxvii.

8. Jack P. Lewis, *A Study of the Interpretation of Noah and the Flood in Jewish and Christian Literature* (Leiden: Brill, 1978), 4, 163-4.

fathers, the ark was a symbol of the church, with the occupants inside destined to be saved, and those outside destined to be lost. The flood waters represented, on the one hand, those passions that bring death and destruction, but on the other hand, the cleansing waters of baptism. The three levels of the ark were also given multiple meanings: earth, sky, and abyss; the three stages in the development of the church; faith, hope, and love; and Noah's three sons. The breadth of the ark (fifty cubits) symbolised the fifty days of Pentecost. The height (thirty cubits) symbolised the thirty years of Jesus life. The length (three hundred cubits divided into six lots of fifty cubits) represented the six ages of the Earth.

Up to and throughout medieval times the principles upon which nature was studied closely paralleled the principles upon which scripture was investigated. Nature was studied, not for its own sake, but for divine reasons. In a work entitled, *Physiologus*, of unknown official authorship but thought to most likely be authored by one of Origen's students, the pelican, because of its propensity to strike itself and shed its blood on its young to revive them from trauma, became an enduring symbol of Christ's atonement.[9] When interpreting those elements of nature mentioned in *Scripture*, the emphasis was on their symbolic meaning. In the Genesis account of creation, light and darkness were thought to represent *just* and *unjust* souls; lights in the firmament were *spiritual gifts*; herbs and fruit-bearing trees were *good works*, and wild beasts represented the *passions* that needed to be brought under the dominion of reason.[10]

Harrison reminds us that these moral and allegorical readings of scripture and nature, "while they may seem to the modern mind somewhat arbitrary and haphazard, were something of a science, requiring of the exegete remarkable skill and ability."[11] The symbolism and associated meaning became endemic to the way Christian faith was practised to the extent that the reading and interpretation of scripture and nature became the province of the scholars of the church rather than the laity of the church. This tradition was challenged during the Protestant Reformation of the sixteenth century. For 1500 years, ecclesiastical tradition had dictated how scripture and nature should be read and understood. The Reformation proposed at least three changes that were to have an impact on the emergence of modern science:

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9. Peter Harrison, *The Bible, Protestantism, and the Rise of Natural Science* (Cambridge: Cambridge University Press, 1998), 23.

10. Augustine, *Confessions*, trans. Henry Chadwick (Oxford: Oxford University Press, 1991), 291, 295f.

11. Harrison, *The Bible, Protestantism, and the Rise of Natural Science*, 45-6.

1. Scripture was to take primacy over tradition in Christian faith and practice.
2. If scripture was to take primacy, it should be available for everyone to read and interpret according to their own conscience.
3. If scripture was to be made available for everyone to read and interpret, then the literal sense had to be the primary sense as this was the sense that didn't need the advanced skills of the scholar for interpretation. This also meant that Scripture needed to be translated into the vernacular.

Peter Harrison argues that the Protestant approach to the interpretation of its sacred texts was a "major catalyst in the emergence of [modern] science."[12] While there were multiple factors responsible for the emergence of science in the sixteenth and seventeenth centuries, "by far the most significant was the literalist mentality initiated by the Protestant reformers, and sponsored by their successors."[13] Harrison asserts that the:

> Protestant Reformation, by promoting the culture of the literal world, effected a dramatic contraction of the sphere of the sacred, forcibly stripping objects, natural and artificial, of the roles they had once played as bearers of meaning . . . It was left to an emerging natural science to reinvest the created order with intelligibility, … that systematic, materialistic understanding of the world embodied in the privileged discourses of natural science.[14]

An Inductive Methodology: Francis Bacon and Baconianism

In line with this movement away from the allegorical sense of interpretation was Francis Bacon's (1561-1626) development of a method of philosophical reasoning about nature based on what he called "simple experience."[15] Observation, based on the senses of sight, touch, smell, and sound could be used to accumulate data about the world which could eventually lead to generalisations from the data. Bacon believed in the design of experiments based on data already accumulated so that new data could be furnished for the natural philosopher. His philosophy of nature based on simple observation and experiment resonated with the "common sense" ideas of the eighteenth century Scottish philosopher Thomas Reid (1710-1796). Bacon's philosophy of science, as it became known in the nineteenth century, combined with Reid's 'common sense' philosophy, was readily adopted in North America because, as Holifield argued, it was seen to "protect and preserve theological truth" as it

12. Ibid., 8.

13. Ibid.

14. Ibid., 117, 120.

15. Francis Bacon, *Novum Organum Scientiarum: Containing Rules for Conducting the Understanding in the Search for Truth; and raising a Solid Structure of Universal Philosophy*, Jones, ed., (London: Sherwood, Neely, and Jones, 1818), I: 65-7.

eschewed speculation, hypotheses and theories, factors believed to be central to the emerging geology that was by then challenging Christian faith.[16]

According to Bozeman, "trust in the senses", central to 'common sense' philosophy, replaced confidence in "pure reason."[17] Facts grasped by sense were deemed of utmost importance and hypotheses, as a form of reasoning, needed to be excluded as legitimate tools of scientific research.[18] The only hypotheses that Reid was willing to accept were those framed as queries that would guide empirical research.[19] The terms *Common Sense Realism, Scottish Philosophy, Scottish Realism, and Baconianism* were used interchangeably by intellectuals in North America to describe these ideas. Holifield claimed that "No other single philosophical movement has ever exerted as much influence on theology in America as Scottish Realism exerted on the antebellum theologians."[20] Nineteenth century Americans believed that "any sane and unbiased person of common sense…. could rightly understand scripture."[21]

Historians have marked Edinburgh-trained John Witherspoon's installation as the president of the Presbyterian College of New Jersey in 1769 as the beginning of the influence of the Scottish Philosophy in America.[22] Noll, reflecting on the complexity of the evangelical engagement with science in America, indicates that "Witherspoon's version of the Scottish Enlightenment offered Americans exactly what they seemed to require to master the tumults of the revolutionary age. . . [because it] met so precisely the social, political, and cultural needs of evangelicals at the time of the American Revolution."[23] Students taught by Witherspoon conveyed this philosophy to newly established colleges and so played an important role in quickly disseminating this philosophy across America.

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16. E. Brooks Holifield, "The Odd Couple: Theology and Science in the American Tradition." (lecture, Emory University, Atlanta, GA, March 25, 2004), 3-4.

17. Theodore Dwight Bozeman, *Protestants in an Age of Science: The Baconian Ideal and Antebellum American Religious Thought* (Chapel Hill, NC: University of North Carolina Press, 1977), 11.

18. Shannon Dea, "Thomas Reid's Rigourised Anti-hypotheticalism," *Journal of Scottish Philosophy* 3, no. 2 (2005): 129-30.

19. Bozeman, *Protestants in an Age of Science*, 19.

20. E. Brooks Holifield, *Theology in America: Christian Thought from the Age of the Puritans to the Civil War* (New Haven, CT: Yale University Press, 2003), 175.

21. George M. Marsden, *Fundamentalism and American Culture*, 2nd ed. (Oxford: Oxford University Press, 2006), 111.

22. Bozeman, *Protestants in an Age of Science*, 22.

23. Mark A. Noll, "Science, Theology, and Society: From Cotton Mather to William Jennings Bryan," in *Evangelicals and Science in Historical Perspective*, ed. David N. Livingstone, D. G. Hart, and Mark A. Noll (New York: Oxford University Press, 1999), 104.

Baconianism was especially popular among the "intellectual middlemen of the day – churchmen, professional orators, quarterly reviewers, pamphleteers, and the like."[24] Hazen describes Baconianism as "more a frame of mind that was absorbed than a method that was explicitly taught."[25] Allen also indicates that "Baconianism was not so much a set of conclusions as it was a method of thinking that stressed empirical observation and an anti-theoretical attitude."[26] Daniels sees it as "a kind of naïve rationalistic empiricism—a belief that the method of pure empiricism consistently pursued would lead to a rational understanding of the universe."[27]

Between the seventeenth and nineteenth century, Baconianism had changed in many respects from the original writings of Bacon and was made more palatable to the general public. Hazen cited George Daniels by noting that:

> American Baconianism was, at least, two steps removed from anything Sir Francis [Bacon] himself had to say. It was first the distinctive interpretation of Bacon by Thomas Reid, Dugald Stewart, and the school of Scottish common-sense realism, whose writings were popular among America's intellectuals in the early nineteenth century. American intellectuals themselves, such as Samuel Tyler, then added some of their own distinctive interpretations before Bacon's scientific thought blossomed into America's 'true philosophy'.[28]

A Christian Baconianism

Noll has noted that, "the empirical, inductive reasoning procedures promoted by Francis Bacon (1561-1626) for use in physical sciences also provided the best methods for organising ethics, epistemology, theology, and the study of the Scripture."[29] The Baconian methodology also started to thrive in theology. Its use of rigorous empiricism employed on facts from human consciousness and facts from the Bible became the standard for justifying

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24. Richard Perry Tison, "Lords of Creation: American Scriptural Geology and the Lord Brothers' Assault on Intellectual Atheism" (PhD diss., University of Oklahoma, 2008), xii.

25. Craig J. Hazen, *The Village Enlightenment in America: Popular Religion and Science in the Nineteenth-Century* (Chicago, University of Illinois, 2000), 27.

26. Leonard C. Allen, "Baconianism and the Bible in the Disciples of Christ: James S. Lamar and the 'Organon of Scripture,'" *Church History* 55, no. 1 (March 1986): 66-7.

27. George H. Daniels, *American Science in the Age of Jackson*, rev. ed. (New York: Columbia University Press, 1994), 66.

28. Craig J. Hazen, " 'Science Never Fails:' Popular Science and the Emergence of American Metaphysical Religion," *Perspectives on Science and Christian Faith* 44 (June 1992): 95-108. The on-line version of the article without separate page numbers was used here. Hazen referenced Daniels, *American Science in the Age of Jackson*, 69-85 as the source for this section.

29. Mark A. Noll, *America's God: From Jonathan Edwards to Abraham Lincoln* (Oxford: Oxford University Press, 2002), 563.

belief in God, revelation, and the Trinity.[30] James Marsh noted in 1829 that this Baconian Common Sense system was so completely identified with Protestantism "that most people considered them as necessary parts of the same system.[31] Most Protestants were convinced that:

> the rock of ages and the rock of common sense scientific reasoning seemed to support each other. From the liberal Unitarians at Harvard to the conservative Presbyterians at Princeton, among the moderate Calvinists of Yale, to their more radical perfectionist offspring at Oberlin, among Methodists and Baptists, and including the 'gentlemanly theologians' of the South, there prevailed a faith in immutable truth seen clearly by inductive reasoning in Scripture and nature alike.[32]

Indeed, nineteenth-century Protestants, because of the strong connection perceived between Common Sense reasoning and the Baconian scientific method, were confident that one could discover the facts of Scripture as clearly as one could discover the facts of science.[33]

Baconianism was widely perceived as a tool to restore harmony between Christian faith and natural science. Based on evidence of several studies of the late 1970s, Allen concludes that "Baconianism proved itself a deft and flexible tool that could be employed in the services of numerous antebellum theologies."[34] Kamen characterised the feelings of American theologians by stating that they "felt more or less sure that the Bible stood safe behind the ramparts of the Common Sense apologetic."[35] Baconian and Common Sense rhetoric could, therefore, be used as "a means of legitimating whatever cause one wished to support and a tool for attacking the views one disliked."[36] By applying the dictums of Baconianism, "the Princetonians described the proper function of science as 'taxonomical,' or the gathering and classifying of facts."[37] Marsden supports this observation with an

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30. Noll, "Evangelicals, Creation and Scripture," 152. Noll based this observation on Bozeman, *Protestants in an Age of Science*, 3-31.

31. James Marsh, preliminary essay to *Aids to Reflection, in the Formation of a Manly Character, on the Several Grounds of Prudence, Morality, and Religion,* by S. T. Coleridge (Burlington: Chauncey Goodrich, 1829), xlv; George M. Marsden, "Everyone One's Own Interpreter? The Bible, Science and Authority in Mid-Nineteenth-Century America," in *The Bible in America: Essays in Cultural History*, ed. Nathan O. Hatch and Mark O. Noll (New York, Oxford University Press, 1982), 82.

32. Marsden, "Everyone One's Own Interpreter?" 82.

33. Kenneth J. Archer, *A Pentecostal Hermeneutic for the Twenty-First Century: Spirit, Scripture and Community* (London: T & T Clark, 2004), 39.

34. Allen, "Baconianism and the Bible," 66.

35. Michael Kamen, "The Science of the Bible in Nineteenth Century America from 'Common Sense' to Controversy, 1820-1900" (PhD diss., University of Notre Dame du Lac, 2004), 180.

36. Allen, "Baconianism and the Bible," 67.

37. Marsden, *Fundamentalism and American Culture*, 111.

example from Charles Hodge's *Systematic Theology*, where Hodge (1797-1878) sketches an analogy between theology and the hard sciences.[38]

However, James Werner notes an additional and contrasting element. He characterises the first half of the nineteenth century as a period when Americans discussed the nature of science from two opposing perspectives. While admitting that there was "a prevailing democratic sensibility in which the average citizen felt competent to assess the relative merits of knowledge," he also notes the complex nature of the emerging sciences, which was such that only specialists could gain access to the "increasingly complex and specialised nature of the sciences, fuelled by an extraordinary infusion of data from around the globe."[39] Not surprisingly these two contrasting perspectives impacted the way that the new emerging geology was to intersect with Christian belief in America. This was particularly so because of contemporary geological developments as discussed below.

Growing Hypotheticity in Geology

Diametrically opposing Baconianism was an increasing hypotheticity in geology. The concept of the hypothesis to guide observations had been nascent in the works of Francis Bacon. During the nineteenth century, the importance of the hypothesis grew. By mid-century, it was common to speak of a working hypothesis and towards the end of the century the concept of multiple working hypotheses was encouraged in geology.[40] The concept of 'multiple working hypotheses' was developed in order to avoid concentration on a favourite hypothesis. Geologists became increasingly aware of the positive impact that hypothetical thinking was providing to their science. Chester Longwell reminded the geological fraternity that the geologist, Reginald Daly, became convinced that geological science could only advance if "geologists speculate to the limit."[41] In 1925, Professor W. M. Davis (1850-1934), the famous geomorphologist, emphasising "the immensely speculative nature of geological

38. Marsden, *Fundamentalism and American Culture*, 112; Charles Hodge, *Systematic Theology* (New York: Charles Scribner, 1872), I:18. The American scriptural geologist David Nevins Lord would use the same argument to try to turn 'theoretical' geology (back) into a simple fact-gathering and classifying geognosy. David Lord's *Geognosy* would be used as a prescribed text at the Adventist Battle Creek College and excerpts of the book would be reprinted in their *Review and Herald*.

39. James V. Werner, "Bringing Down Holy Science: The *North American Review* and Jacksonian Scientific Inquiry," *American Periodicals* 10 (2000): 27. Werner based this observation on Daniels, *American Science in the Age of Jackson*, 34-37.

40. See Thomas C. Chamberlin, "The Method of Multiple Working Hypotheses," *Science* 15 (1890): 92-6.

41. Chester R. Longwell, "The Mechanics of Orogeny," *American Journal of Science* 243 (1945): 446.

science," read a paper on the topic of "The Value of Outrageous Geological Hypotheses."[42] William H. Davis, the more recent Pierce scholar, similarly noted that "*scientific reasoning does not depend upon induction at all!* . . . Scientific reasoning, indeed all of our reasoning, depends upon the mind's ability to have insights, to see things coherently and harmoniously, to see laws and principles, in short, to make up hypotheses."[43] The proposal of challenging hypotheses was seen as a necessity for ongoing geological research. W. M. Davis, therefore, encouraged the practice of posing outrageous hypotheses to stimulate the accumulation of geological knowledge. Clearly geologists and those Baconian Christians earlier described, including Adventists, were thus using totally opposing philosophies of science. Christian Baconians perceived the hypothesis as a major weakness and considered it a derogatory term. Seventh-day Adventists in the 1880s would identify "true science," to be science based on "facts" and in agreement with Scripture. Hypothetical science in conflict with revelation they would label "science falsely so-called."[44] Numbers refers specifically to Ellen White in *Testimony for the Church* as saying, "Again and again we shall be called to meet the influence of men who are studying sciences of satanic origin, through which Satan is working to make a nonentity of God and of Christ."[45]

Together with the greater visibility of the scientific hypothesis generally, there were additional patterns of change within scientific discourse. During the latter half of the nineteenth century natural explanations became favoured over supernatural explanations. By the mid-nineteenth century theistic explanation or "God-talk" was gradually moved beyond the boundaries of science.[46] There was likewise a trend toward privatisation of religious views; "by the end of the 1880s . . . references to God were seldom appearing in the increasingly specialised literature of science, and scientists were saying less about their

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42. W. M. Davis, "The Value of Outrageous Geological Hypotheses," *Science* LXIII, no. 1636 (May 7, 1926): 463-68.

43. William H. Davis, *Pierce's Epistemology* (The Hague: Martinus Nijhoff, 1972), 34; Victor R. Baker, "Hypotheses and Geomorphological Reasoning," in *The Scientific Nature of Geomorphology: Proceedings of the 27th Binghamton Symposium in Geomorphology held 27-29 September 1996*, eds. Bruce L. Rhoads and Colin E. Thorn (Chichester, U. K.: Wiley, 1996), 61. Italics and emphasis as quoted.

44. Ronald L. Numbers, "Science Falsely So-Called: Evolution and Adventists in the Nineteenth Century," *Journal of American Scientific Affiliation* 27 (March 1975): 18-23.

45. Ronald L. Numbers, "'Sciences of Satanic Origin': Adventist Attitudes Toward Evolutionary Biology and Geology," *Spectrum* 9, no. 4 (1979): 17.

46. Ronald L. Numbers, "Simplifying Complexity: Patterns in the History of Science and Religion," in *Science and Religion: New Historical Perspectives*, ed. Thomas Dixon, Geoffrey Cantor, and Stephen Pumfrey (Cambridge: Cambridge University Press, 2010), 264.

religious convictions."[47] Also, there was increasing secularisation; many scientists abandoned their religious beliefs. Wittmer, based on an analysis of nineteenth century geology textbooks, concludes that "the secularisation of geology texts can be seen as part of a broad pattern, in nineteenth century America, of the secularisation of learning in general."[48]

2.3 Nineteenth Century Geological Thought

The epicentre of developing geological thought prior to and during the nineteenth century was undoubtedly Europe. However, with the migration of competent geologists to North America around the beginning of the nineteenth century geology as a science quickly extended itself into the new world. This brief review of the development of geological thought will compare and contrast the situation in Europe and North America as it reflects on the topic of this thesis.

2.3.1 Differing Geological Views in Europe

It is generally acknowledged that natural philosophy took on the format of modern science during the nineteenth century. Andrew Cunningham claims that the "invention of science" was "a historical event of the period c1780-c1850."[49] During the same period, the previously all-encompassing field of natural history started to transform into separate scientific disciplines such as geology and biology. According to Rudwick, the introduction in 1778 and quick acceptance in the following years of the term *geology* for the new science is attributed to Jean-André Deluc (or de Luc, 1727-1817) and Horace-Bénédict de Saussure (1740-99).[50] Geology started to differentiate itself from earlier notions of geognosy, which dealt with observations on the structure, sequence, and mineralogy of rock formations. While geognosy was "rigorously observational and empirical, usually detailed and local, and primarily descriptive rather than causal in its aims", geology, which also used much observational evidence, had implicitly "high-level causal explanation" as its goal.[51] While the deeper roots of geology go back several centuries, modern geology as we now know it went

47. Numbers, "Simplifying Complexity," 269.

48. Paul W. Wittmer, "The Secularisation of Geology Textbooks in the United States in the Nineteenth Century" (PhD diss., New York University, 1967), 315.

49. Andrew Cunningham, "Getting the Game Right: Some Plain Words on the Identity and Invention of Science," *Studies in the History and Philosophy of Science* 19 (1988): 385.

50. Martin J. S. Rudwick, *Bursting the Limits of Time: The Reconstruction of Geohistory in the Age of Revolution* (Chicago: University of Chicago Press, 2005), 134-5.

51. Martin J. S. Rudwick, *Georges Cuvier, Fossil Bones, and Geological Catastrophes* (Chicago: Chicago University Press, 1997), 6.

through an extraordinary strong formative period around the turn of the nineteenth century (see Lyell, 1830; Geikie, 1897; von Zittel, 1901; Porter, 1977; Tinkler, 1985; Gohau, 1990; Laudan, 1987; Ellenberger, 1994; Oldroyd, 1996 on this topic).[52]

From the 1780s onwards, geology became one of the emerging sciences shaped by philosophical discussions about optional scientific methodologies.[53] Geologists soon realised that for the new science to become respectable, it had to separate itself from the unverified ideas of the past. Initially the predominant opinion opposed hypotheses. For example, in 1807 on the occasion of a book review for the *Classe des Sciences Physiques et Mathematiques* of the French *Institut National,* the French naturalists Georges Cuvier, René Just Haüy and Claude-Hugues Le Lièvre, provided some reflections on the state of geological matters. They specified that *géologie* had too many theories, was based on too few facts, and that therefore, among the younger generation of naturalists, the mention of the name geology tended to provoke laughter. Cuvier, Haüy and Le Lièvre emphasised that for geology, as a branch of natural philosophy, to become a respected science it needed to base itself more on facts, observations and induction.[54]

In the same year, 1807, the Geological Society of London was founded. The Society quickly spoke out against the unbridled use of theories in pre-nineteenth century literature and unequivocally promoted its strong emphasis on observations and the collection of facts. Within the first two years of its existence, its members were made aware that the image of geology within the scientific community needed to be improved by getting rid of the perception of a speculative and *a priori* type of science. For that, its intended legitimating

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52. Charles Lyell, *Principles of Geology, Being an Attempt to Explain the Former Changes of the Earth's Surface, by Reference to Causes now in Operation* (London: John Murray, 1830); Archibald Geikie, Founders of Geology (London: Macmillan, 1897); Karl A. von Zittel, *History of Geology and Palaeontology*, Eng. trans. Marie M. Ogilvie-Gordon (London: Walter Scott, 1901); Roy Porter, *The Making of Geology, Earth Science in Britain 1660-1815* (Cambridge: Cambridge University Press, 1977); Keith J. Tinkler, *A Short History of Geomorphology* (Totowa, NJ: Barnes and Noble Books, 1985); Gabriel Gohau, *A History of Geology*, rev. and trans. Albert Carozzi and Marguerite Carozzi (New Brunswick: Rutgers University Press, 1990); Rachel Laudan, *From Mineralogy to Geology: The Foundations of a Science,* 1650-1830 (Chicago, Chicago University Press, 1987); François Ellenberger, *Histoire de la Geologie, la Grande Éclosion et ses Premises 1660-1810*, Tome 2 (Paris: Lavoisier, 1994); David R. Oldroyd, *Thinking about the Earth: A History of Ideas in Geology* (Cambridge, MA: Harvard University Press, 1996).

53. Timothy McGrew, Marc Alspector-Kelly, and Fritz Allhoff, eds., "Methodology and Revolution," in *Philosophy of Science: An Historical Anthology* (Malden, MA: Wiley-Blackwell, 2009), 238.

54. Georges Cuvier, René-Just Haüy, et Claude Hugues Le Lièvre, "Rapport de l'Institut National (Classe des Sciences Physique et Mathematiques), sur l'Ouvrage de M. André, ayant pour Titre: Théorie de la Surface de la Terre," *Journal des Mines* 21, no. 126 (June 1807): 422-4.

methodology needed to be put on a sound empirical footing.[55] The Society embarked on a program of cooperative data gathering and adopted old-fashioned Baconian induction as their anti-theoretical, well-established method of scientific inquiry.[56] In 1809 the Society agreed, based on their chosen Baconian methodology, to prepare a program of action to compose a geological map of the entire country. This action plan provided a strong stimulus and guidance for geologists to collect field data.

However, this tide would soon change. On perusing early volumes of the *Edinburgh Review*, it became obvious to Laudan[57] that the outdated, conservative and naïve form of Baconian induction quickly stifled any theoretical innovation and development needed for real scientific progress. In the 1820s, a younger generation of members of the society started to argue for their various speculative theories and to embrace and put into practice a more liberal methodology that embraced a form of induction as guided by hypotheses. According to Laudan, only from then onwards did geology in England begin to flourish and to influence the wider development of science.[58]

Several geo-historians have articulated the complex interactions that led to the development of the new science of geology. By the early nineteenth century, as a result of a number of favourable conditions, "a clear concept of geology was coming into focus" as "a highly complex construct of formal and informal institutions, practices, standards, beliefs and facts, forged over time."[59] As a result, geology had already developed "its own conventions and perspectives that were distinct from common sense wisdom by the early part of the century."[60] The typical nineteenth century geologist is portrayed by Oldroyd as one who "examines rocks, minerals, fossils and strata, enters information about these entities on a map

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55. Rachel Laudan, "Ideas and Organizations in British Geology: A Case Study in Institutional History," *Isis* 68, no. 4 (December 1977): 529.

56. It should be realised that at least half of the founders of the Geological Society were not geologists at all but were Fellows of the Royal Society which acted as an advisory body to the British government on mathematics, natural sciences, technology and medicine. The founders also included business men with serious interests in mining. This helps to explain the initially strong emphasis on empirical data collection and mapping (Rudwick, *Bursting the Limits of Time*, 463-4).

57. Laudan, "Ideas and Organizations in British Geology," 529. Laudan quotes the first volume of the Transactions of the Geological Society as published in the *Edinburg Review* (1811) that geology was previously considered "a species of mental derangement, in which the patient raved continually of comets, deluges, volcanoes and earthquakes." Anonymous, "Transactions of the Geological Society, established November 1807," *Edinburgh Review* 19 (November 1811-February 1812): 207.

58. Laudan, "Ideas and Organisations in British Geology," 537-8.

59. Roy Porter, *The Making of Geology, Earth Science in Britain 1660-1815* (Cambridge: Cambridge University Press, 1977), 216.

60. Ibid.

and, endeavours to work out a plausible sequence of events that could have given rise to the disposition of the strata observed at the present time."[61] Textbooks were published to instruct geologists on how to observe in the field (for example, de la Beche, 1835), and it was the development of research programs for field data collection that became "the basis for the expansion of routine nineteenth century geology."[62] The Geological Society of London played an important role in providing a timely "practical program of research and a common goal" for their constituents.[63]

Rudwick argues that geology did not simply emerge as a "natural differentiation of a cumulative growing body of knowledge, but that its emergence must also be interpreted as a product of highly specific intellectual and social circumstances at a specific time and place."[64] The great progress in nineteenth century geology in Britain cannot, according to Tinkler, be seen separated from the ambient scientific, economic and cultural milieu. He mentions the influence of the Industrial Revolution with:

- the associated expansion of mining
- the building of a canal network
- the production of geological maps giving rise to the Geological Survey
- the development of a professional field methodology
- the creation of scientific societies and journals
- the publishing of geological textbooks and the records of scientific travellers.[65]

Porter comprehensively frames the context for the development of geology in terms of:

- the rise of science as a culture
- economic expansion and industrialisation
- the need for more scientific knowledge of the earth
- investigations of the complex history of the strata and their fossils that led to solutions and created new fields of investigation
- the teleological directionalism of the Bible that influenced the pattern of Earth history
- Baconianism that promoted the continual accumulation of facts

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61. Oldroyd, *Thinking about the Earth*, 60.

62. Roy Porter, *The Making of Geology*, 217; Henry T. de la Beche, *How to Observe: Geology* (London: Charles Knight, 1835).

63. James A. Secord, *Charles Lyell, Principles of Geology*, edited with an introduction (London: Penguin, 1997), xi.

64. Martin J. S. Rudwick, "The Emergence of a New Science," *Minerva* 28, Issue 3 (September 1990): 386.

65. Keith J. Tinkler, *A Short History of Geomorphology* (Totowa, NJ: Barnes and Noble Books, 1985), 67-71.

- Newtonian science that promoted confidence in the orderliness of Creation and the ability to understand the universe.[66]

Gradually, however, modern nineteenth century geology started seeing an order of Nature instead of an order of God. As a consequence, "geological discoveries were often profoundly disquieting and difficult to accept for prominent social groups, even if geologists themselves generally engineered reconciliations between their discoveries and elements of older religious cosmologies."[67]

It had been common during the nineteenth century to identify the investigations and speculative theories of the seventeenth and eighteenth centuries as a hindrance to the progress of geology. This negative perception is generally ascribed to Charles Lyell's craftily written, tendentious version of geological history in the introduction to his *Principles of Geology*.[68] Lyell's constructed myth would persist in the geological literature until, at least, the 1960s. Roy Porter was one of the first to argue that in fact the activities and ideas of the preceding centuries had instead actually provided a valuable basis for the rapid development of geology during the nineteenth century.[69]

Karl A. von Zittel labelled the years 1790 to 1820 as the "Heroic Age of Geology." He sees "the determination to discountenance speculation and to seek untiringly in the field and in the laboratories after new observations, new truths" as the characteristic aspect of this period.[70] The emphasis was on the "investigation and description of the accessible parts of the earth's crust" and Abraham Gottlob Werner's 'geognosy' provided a strict descriptive method to do just that.[71] According to Rachel Laudan, "Werner's theory marks a pivotal point in the development of geology."[72] Rather than being merely the offshoot of the seventeenth-century theories of the earth, the science of geology emerged much more directly through the tradition of classifying rock materials that started in the late eighteenth century. Building on earlier attempts to classify rocks and minerals, Werner classified rocks

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66. Porter, *The Making of Geology*, 218-20.

67. Ibid., 220.

68. Nicolaas A. Rupke, foreword to *Genesis and Geology: A Study in the Relations of Scientific Thought, Natural Theology, and Social Opinion in Great Britain, 1790-1850* by Charles G. Gillespie (Cambridge, MA: Harvard University Press, 1994), ix.

69. Porter, *The Making of Geology*, 2-3.

70. Karl A. von Zittel, *History of Geology and Palaeontology*, Eng. trans. Marie M. Ogilvie-Gordon (London: Walter Scott, 1901), 46-7.

71. Ibid., 47.

72. Laudan, *From Mineralogy to Geology*, 87.

successively upwards from the lowest as Primitive, Transition, Flötz or Stratified (Secondary) rocks, and Recent, which included Alluvial and Volcanic rocks.[73] With this, Werner introduced the important concept of [rock] formations that was linked with the criterion of superposition in his classification of formations. Later commentators saw the incipient aspect of age (or time) as a derivative consequence of Werner's superposition of formations.[74]

According to Werner, the rocks had been successively deposited in water, but this theory did not make him necessarily a 'catastrophist,' as he believed that the processes responsible then were similar to the present ones.[75] A general weakness of his scheme lay in the role assigned to fossils. He saw fossils simply as a characteristic that separated stratified rocks from Primitive rocks but did not use them to subdivide the stratified rocks. Because Werner's scheme acted as a guiding framework and not as an "unassailable dogma," it could easily be adopted or modified according to the local needs by his dedicated students. Geologists recognised in Werner's theory a clear program of research that they could modify when they ran into difficulty.[76] According to Laudan, the Wernerian scheme has not always received the attention it deserves, especially in British historiography, due to the excessive attention to Lyell's geology and his version of historiography.[77]

The perception of geology has been strongly influenced by the perspectives of influential historiographers, and this has led to skewed views of the science. Laudan astutely observes that,

> The prevailing historiography of geology owes much to historical accident, and even more to historical precedent. Historical accident because Charles Darwin started his career as a member of the British School of geology, and the success of evolutionary theory has cast a retrospective glamour over the geology of his mentors, particularly over Lyell's geology. This has meant that much history of geology has been written rather as a prelude to the theory of evolution than as a development in its own right. Historical precedent [was set] because Lyell composed a powerful apologia for much of the received view in the introduction to his *Principles of Geology* (1830-33), an

73. Abraham G. Werner, *Kurze Klassifikation und Beschreibung der Verschiedenen Gebirgsarten* (Dresden: In der Waltherischen Hofbuchhandlung, 1787). The group of transition rocks was later added to his original classification.

74. Laudan, *From Mineralogy to Geology*, 94-5; Rudwick, "The Emergence of a New Science," 390-1.

75. Laudan, *From Mineralogy to Geology*, 90; Rudwick, "The Emergence of a New Science," 390. Rudwick strongly supports the view that Werner was *not* a catastrophist, a biblical literalist, or an adherent to a short timescale.

76. Laudan, *From Mineralogy to Geology*, 227.

77. Ibid., 224.

interpretation that Archibald Geikie accepted and persuasively extended in his *Founders of Geology* (1905/1962).[78]

Persisting textbook myths have come to the notice of scholars. That Lyell is perceived as a forerunner of Darwin and that Lyell discovered past time necessary for the discovery of evolution and thus was the man that made evolution possible is one such myth.[79] This is an extremely simplified and distorted version of a much more complex geological historiography. The "subtle influence of Lyellian thinking" still "haunts" the modern geologist in some ways.[80] Furthermore, "modern creationists pretend that his [Lyell's] restrictive uniformitarianism is still geology's basis for rejecting biblical catastrophism."[81] According to Dott, modern geologists are neither catastrophists nor uniformitarians.[82] Rather, they agree that Earth history was characterised by an entire range of episodic phenomena of a great variety of magnitudes and frequencies. Rupke adds that "The common notion that modern geology originated with uniformitarianism is a hindrance to the unencumbered study of the origin of the new geology."[83] On this matter, the "true history of the controversy is a good deal more complicated and certainly more interesting."[84] It can be safely assumed that the British School historiography, because of historical colonial ties, strongly influenced the received historiographical view in American geological circles and the wider popular spheres beyond. A correction of this received view is important for fully appreciating the historical engagement between geological and Adventist thought.

Reading the works of continental European historians of geological thought in the nineteenth century (Cuvier, 1810; d'Archiac, 1847-60; Brocchi, 1814; Hoffman, 1838) and more recently (von Zittel, 1901; Hooykaas, 1963, 1970; Gohau, 1990; Ellenberger, 1994) will provide an alternative view of historiography with a wider intra-continental European scope,

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78. Ibid.

79. J. M. I. Klaver, *Geology and Religious Sentiment: The Effect of Geological Discoveries on English Society and Literature between 1829 and 1859* (Leiden: Brill, 1997), xii-xiii.

80. Robert H. Dott, "What is Unique about Geological reasoning?" *GSA Today* (October, 1998): 17.

81. Ibid.

82. Robert H. Dott, "The Challenge of Scientific Creationism," *Journal of Paleontology* 56, no. 2 (March 1982): 267.

83. Nicolaas A. Rupke, *The Great Chain of History: William Buckland and the English School of Geology (1814-1849)* (Oxford: Clarendon Press, 1983), 5.

84. A. Hallam, *Great Geological Controversies*, 2nd ed. (Oxford: Oxford University Press, 1989), 30.

different central themes and other heroes.[85] Within the last few decades the wider scope, which includes important historical developments in continental Europe, has increasingly become a feature in the works of modern Anglo-centric historians of geology such as Martin Rudwick, David Oldroyd, and Anthony Hallam. François Ellenberger (1994), with a definite continental European perspective, considers that it was through a conjunction of factors in the nineteenth century that modern geology acquired a coherent method and doctrine that became supported by a large community that organised itself into institutions and societies where findings could be pooled, and ideas exchanged. According to him a sufficient "*masse critique*" was needed for the creation of a multiplying effect of innovations to undertake common programs, and to solve their ever new problems.[86]

Some of the factors that made this conjunction possible were:

- a general leap forward in the sciences (e.g. chemistry, physics, mathematics); the appearance of people of genius who initiated progress in geology (James Hutton, 1726-1797; Abraham Gottlob Werner, 1749-1817; Georges Cuvier, 1769-1832);
- professionalisation which promoted on-going research;
- the Industrial Revolution;
- religious relaxation towards geology (a removal of hindrances and in certain cases a promotion of geology);
- and the accumulation of greater knowledge during the Great Awakening years of 1800-1825 (with a discarding of the 'wild' theories and systems of the previous centuries).[87]

Rudwick notes a radical transformation in the Earth sciences during this period by them "becoming deeply historical in their outlook and practice."[88] Geologists had realised that features such as mountains, volcanoes, rocks, and fossils have histories built into them that can be analysed. David Oldroyd saw a concurrence between historicism, the establishment of a general historical outlook in the eighteenth century, and the emergence of

85. Laudan, *From Mineralogy to Geology*, 225; Georges Cuvier, *Rapport Historique sur les Progres des Sciences Naturelles depuis 1789* (Paris: Imprimerie Imperiale, 1810); Giovanni Brocchi, *Conchiologia Fossile Subapennina, con Osservazioni Geologiche sugli Apennini e sul suolo Adiacente* (Milano: Dalla Stamperia Reale, 1814); Friedrich Hoffmann, *Geschichte der Geognosie, und Schilderung der Vulkanischen Erscheinungen* (Berlin: Nicolaischen Buchhandlung, 1838); Adolphe d'Archiac, *Histoire des Progrès de la Géologie de 1834 à 1845* (Paris: Société Géologique de France, 1847).

86. Ellenberger, *Histoire de la Géologie*, 318.

87. Ibid., 319-21.

88. Martin J. S. Rudwick, "Biblical Flood and Geological Deluge: The Amicable Dissociation of Geology and Genesis," in *Geology and Religion: A History of Harmony and Hostility*, Geological Society Special Publication no. 310, ed. Martina Kölbl-Ebert (London: Geological Society, 2009), 103.

historical geology, based on the evidence of the rocks and fossils.[89] Geologists started to 'think historically.' The deciphering of the Earth's history was, however, complicated by the fact that it was not directly observable and only fragmentarily preserved.[90] Towards the turn of the century, therefore, there arose a new emphasis on fieldwork and data collection rather than the construction of the speculative theories of old such as Thomas Burnet's *The Theory of the Earth* (1684).[91] As a result of this new prominence of empirical fieldwork, a stratigraphic column based on the accumulated data, independent of any major publications on evolutionary thought, became a reality early on in the nineteenth century.

Geology and Religion in Britain: Harmonising and Scriptural Geologists

The creation event recorded in Genesis 1 and 2 and the global flood narrative recorded in Genesis 6-8 were by this stage, following the Reformation, now read by Christian communities not so much as moral or allegorical lessons in virtue but as literal historical events of geological significance. Two different reactions to this tension between geology and religion during the first half of the nineteenth century can be identified. Proponents of the first reaction were called the *harmonising geologists*: they were generally practising geologists of academic standing that had an earnest desire to reconcile Genesis with the emerging geology. The second group may be classified as the *scriptural geologists*: individuals who had strong Christian apologetic motives and generally without much (or any) practical experience in geology. These groups are particularly relevant because they influenced the development of their counterparts in North America.

Amongst the harmonisers, we find William Buckland (1784-1856), Adam Sedgwick (1785-1830) and William D. Conybeare (1787-1857), all geology professors connected to the Anglican institutions of higher learning. In addition, there is the Congregationalist John Pye Smith (1774-1851), and most of all Hugh Miller (1802-1856), best known for works such as *Footprints of the Creator* (1849), and *The Testimony of the Rocks* (1857). One of Miller's famous quotes clearly characterises his disdain for the group of scriptural geologists: "The

89. David R. Oldroyd, "Historicism and the Rise of Historical Geology, Part 1," *History of Science* 17 (September 1979): 191-3.

90. Martin J. S. Rudwick, introduction to *The New Science of Geology: Studies in the Earth Sciences in the Age of Revolution* (Aldershot, Hampshire: Ashgate, 2004), vii.

91. Thomas Burnet, *The Theory of the Earth: Containing an Account of the Original of the Earth, and of All the General Changes Which It Has Already Undergone, or is to Undergo, till the Consummation of all Things, The Two First Books Concerning the Deluge, and Concerning Paradise* (London: R. Norton, 1684).

writings of Moses do not fix the antiquity of the globe."[92] The most widely sold publication from among the harmonisers, however, was Buckland's Bridgewater Treatise: *Geology and Mineralogy Considered with Reference to Natural Theology* (1836).

Most of the geologists belonging to this group combined a genuine interest in geology based on solid fieldwork with Scripture in order to reconcile the Genesis account of creation, thought to have occurred about 6,000 years ago according to Ussher's chronology, with the long ages of the emerging scientific geology. They would either use the gap theory or the day-age approach for finding harmony. The gap theory proposed that millions of years could have been present between Genesis 1:1 and Genesis 1:2 and the day-age approach supposed that each day of the creation account could represent thousands or millions of years. Even in the face of new conflicting geological data, they would not give up their desire to seek harmony and staunchly to keep their faith. They were often the target of the scriptural geologists who saw the harmonisers as not being true to the Scriptures.

Scriptural geologists were, according to Mortenson, alternatively known as 'Mosaic geologists' or 'biblical literalists.' They were, as he described them, an eclectic band of people who opposed the new geological theories being developed at the time. They instead believed that the Noachian Flood produced much, or most, of the sedimentary rock formations and that the Earth was about six thousand years old.[93] Mortenson was a Creationist who defended the geological competency of the scriptural geologist.[94] Most non-creationist authors did not agree with Mortenson's valuations. His book, *The Great Turning Point: The Church's Catastrophic Mistake on Geology – Before Darwin*, has however been acknowledged for the valuable autobiographical details it contains concerning the group of scriptural geologists. He provides the following motivations for the publications of scriptural geologists:

- They wrote on the subject out of the conviction that the old-earth theories were leading the geologists into a bewildering labyrinth that would impede the progress of true geological knowledge, by locking observations and interpretations into a false theoretical framework, thereby blinding geologists from seeing what they might otherwise see.

92. Hugh Miller, *The Testimony of the Rocks; or Geology in its Bearings on the Two Theologies, Natural and Revealed* (Boston: Gould and Lincoln, 1857), 141. Italics as in the original.

93. Terry Mortenson, *The Great Turning Point: The Church's Catastrophic Mistake on Geology – Before Darwin* (Green Forest, AR: Master Books, 2004), 11-2.

94. Dr Terry Mortenson is employed by the apologetics ministry Answers in Genesis.

- The *primary* motivation behind the scriptural geologists' defence of a biblically based view of earth history was their expressed unshakeable conviction that the Scriptures were the inspired, infallible, and historically accurate Word of God.
- They believed that with the rejection of the plain teaching of Genesis, the proper interpretation and authority of the rest of Scripture would be undermined so that faith in other important biblical doctrines, including the origin of evil, the gospel, and the second coming of Christ, would be slowly eroded.[95]

Mortenson constructed these reasons clearly with a new-creationist perspective in mind. It would have been more authentic if he could have supported the above motives with relevant quotes of the scriptural geologists themselves; in this form, they appear somewhat retroactively constructed to support his views.

Roberts indicates that for Mortenson 'scriptural' meant adhering to a literal hermeneutic.[96] Roberts clearly did not favour the term 'scriptural geologist', and preferred to use the term 'anti-geologist,' as initially coined by Hugh Miller in 1857. Miller used the term 'anti-geologist' for "those who spoke against geological theories using Scripture as their source of knowledge."[97] Roberts states that the term 'anti-geologist' is theologically neutral and instead focusses on attitudes to geology.[98]

The anti-geologist strongly believed in a literal-narrative view of the Bible. Roberts further divides the scriptural geologists into 'evangelical anti-geologists' and 'scientific anti-geologists'. The evangelical anti-geologists were mainly clergy and laity. Roberts admits that 'scientific anti-geology' appears to be an oxymoron, but he justifies its usage by claiming that anti-geologists "argued that their geology was more scientific than conventional geology."[99] Since the term 'scriptural geologist', despite its obvious misgivings, remains most commonly used by relevant authors, it will be used in this thesis.

Lynch was convinced that "scriptural geologists represented a backlash against geological developments in the early 1800s," and he characterised the scriptural geologists as follows: "few of these critics had any first-hand experience in field geology, most showed little presence in the emerging professional societies, had comparatively few scientific

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95. Mortenson, *The Great Turning Point*, 213-5.

96. Michael Roberts, *Evangelicals and Science* (Westport, CT: Greenwood Press, 2008), 101.

97. See John M. Lynch, *Creationism and Scriptural Geology, 1817-1857* (Bristol: Thoemmes Press, 2002), xi.

98. Roberts, *Evangelicals and Science*, 102.

99. Ibid., 104.

publications, and would not have considered themselves to be 'geologists'."[100] Understandably, the fact that they did not *do* any geology seemed to have especially annoyed the expert geologists. In 1827 Charles Lyell, for example, expressed his strong displeasure with the writings of the scriptural geologists as follows:

> We cannot sufficiently depreciate the interference of a certain class of writers on this question . . . While they denounce as heterodox the current opinions of geologists with respect to the high antiquity of the earth and of a certain class of organic beings, they do no [sic] scruple to promulgate theories concerning the creation and the deluge, derived from their own expositions of the sacred text, in which they endeavour to point out the accordance of the Mosaic history with phenomena which they have never studied, and to judge of which every page of their writings proves their consummate incompetence.[101]

Stiling sees the appearance of scriptural geology in Great Britain more as a response to an attempted new biblical understanding of the growing accumulation of new geological information than as an initiative by an emerging group of reactionaries.[102] The scriptural geologists, contrasted the theories of the geologists with their own common sense conclusions. Stiling explains the motives of the nineteenth century scriptural geologists as a wish to "protect and preserve the Bible from the perceived encroachments of a threatening science," and to come against "any hermeneutical compromises that ill-advised interpreters of Genesis might inappropriately grant to promoters of geology."[103] The last statement was clearly directed at the harmonising geologists of their times. Rudwick thinks that scriptural geology was "in part a cultural reaction to the social and cognitive exclusion of all but self-styled experts from an area of speculation that, in the heyday of theories of the earth had been open to all."[104]

The Perception of a Diminishing Geological Deluge in Britain

The harmonising geologists matched their strong faith in the word of God with a courageous display of academic honesty. Where new geological evidence showed that their

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100. Lynch, *Creationism and Scriptural Geology*, xii.

101. As quoted in Lynch, *Creationism and Scriptural Geology*, xv-xvi.

102. Rodney Lee Stiling, "Scriptural Geology in America," in *Evangelicals and Science in Historical Perspective*, ed. David N. Livingstone, D. G. Hart, and Mark A. Noll (Oxford: Oxford University Press, 1999), 178.

103. Ibid., 177.

104. Martin J. S. Rudwick, "The Shape and Meaning of Earth History," in *God and Nature: Historical Essays on the Encounter between Christianity and Science*, ed. David C. Lindberg and Ronald L. Numbers (Berkeley, CA: University of California Press, 1986), 312.

earlier statements had proved incorrect, they publically denounced earlier interpretations. The 1820s saw an emerging mixture of catastrophist theory, Huttonian dynamics (e.g. the actualistic method, the development of unconformities between landscape cycles), and plutonism (rocks formed from volcanic activity as contrasted with water-based neptunism). The harmonising British geologists combined their acceptance of such geological theories with a strong belief in the *scriptural* Deluge. They kept an open mind towards important new field evidence that might require an adaptation of their hypotheses.

Reported field observations in the Auvergne in central France may serve as an example of how geologists revised their ideas. By the 1820s (French and British) European geologists had become convinced that river valleys had not formed as the result of *one* sudden catastrophe, but that they contained a decipherable history of their formation. River valleys in the Auvergne provided unambiguous evidence of multiple phases in their development. Especially the work of the British geologist George Poulett Scrope provided a classical example (see fig. 2.1).[105] Scrope's observations showed that lava flows from the Puy de Dôme had occurred at different intervals to create a 'natural scale' or relative 'chronometer' for measuring the process of river erosion. Such lava flows, he argued, had preserved past river profiles and had highlighted successive phases in the erosion process of the river valleys.[106] Lyell, who had reviewed Scrope's *Memoir on the Geology of Central France* for the *Quarterly Review*, the next year visited the Auvergne on his European 'Grand Tour' with fellow geologist Roderick Murchison. Lyell's continental visit provided key material for his forthcoming *Principles of Geology*.[107] Lyell showed in a schematic cross-section how these lava flows had 'fossilised' alluvial gravels on river terraces of different ages (see fig. 2.1). He convincingly argued that,

> a considerable interval of time occurred between the formation of the uppermost bed of gravel and that next below it; during which interval the uppermost lava was poured out and a valley excavated, at the bottom of which the second bed of gravel

105. George Poulett Scrope, *Memoir on the Geology of Central France, Including the Volcanic Formations of Auvergne, the Velay and the Vivarais*, 2 vols. (London: Longman, Rees, Orme, Brown, and Green, 1827). Scrope had been very frugal in referencing earlier geological works on the Auvergne.

106. Rudwick, *Worlds Before Adam: The Reconstruction of Geohistory in the Age of Reform* (Chicago: Chicago University Press, 2008), 214-5.

107. Charles Lyell, [Review of] "Memoir on the Geology of Central France, Including the Volcanic Formations of Auvernge, the Velay, and the Vivarais, with a Volume of Maps and Plates, by G. P. Scrope, F.R.S., F.G.S," *Quarterly Review* 36 (1827): 437-83. Lyell's three volumes of Principles of Geology were published between 1830 and 1833. Lyell indicated that similar observations had been made by French geologists Desmarest (1779), Ramond de Carbonnières (c1789), Montlosier (1802), De Luc (1809), Bertrand de Doue (1823), Croizet and Jobert (1826-28), Bouillet (1827), and others.

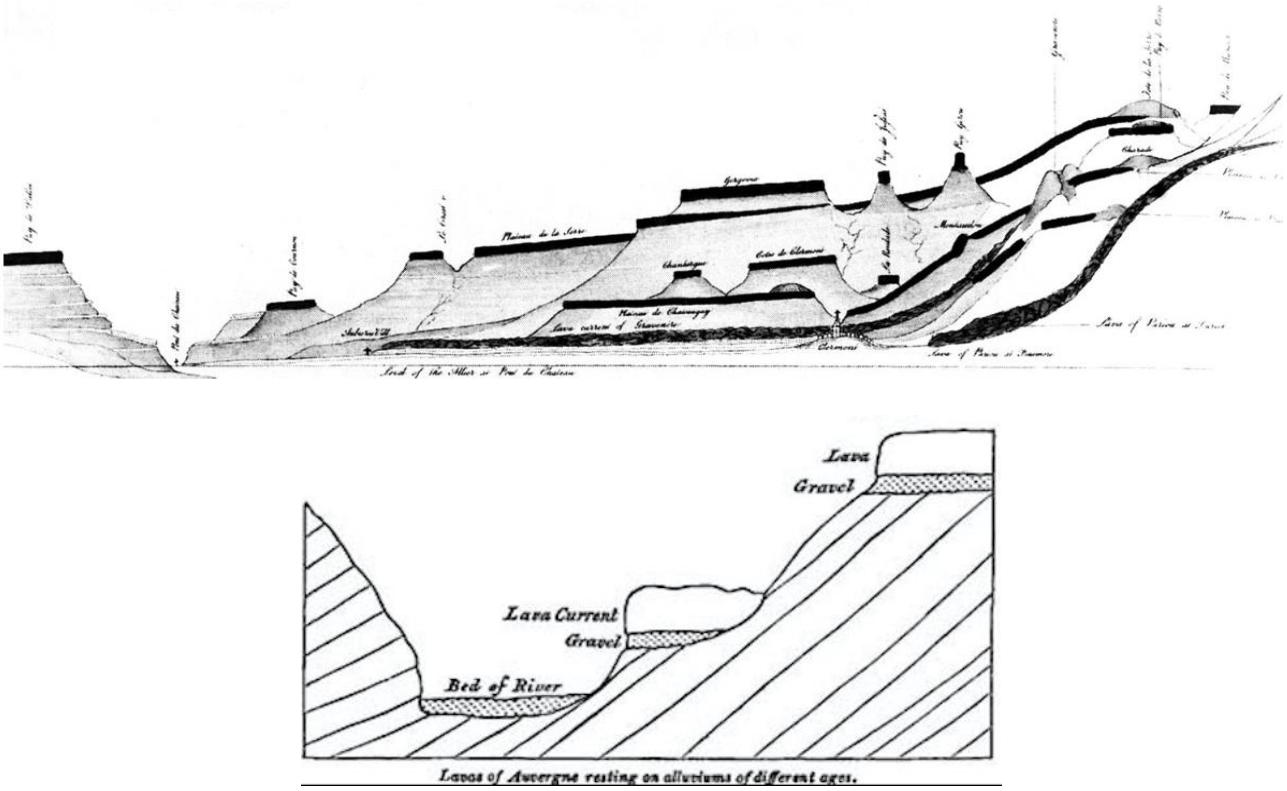


Figure 2.1. Lavas resting on river valley deposits in the Auvergne, France. Above, Scrope's diagram of longitudinal river profiles with lavas (black caps) resting on river deposits (grey). Lava flows originated from the Puy de Dôme (further to the right) and flowed into the valley of the River Allier. Below, Lyell's schematic cross-section of the Allier River valley, showing how lavas preserved multiple events of valley development (1833).

Source: Scrope, *Memoir on the Geology of Central France* vol. 2, pl. 14 (1827); Lyell, *Principles of Geology*, vol. 3 (1833), 267.

> accumulated. In like manner the pouring out of a second current of lava, and a farther deepening of the valley, took place between the date of the second gravel and that of the modern alluvium which now fills the channel of the river.[108]

Such types of evidence convinced most geologists, including harmonising and British scriptural geologists that there had been multiple erosional events and not just one catastrophic event.

Several leading harmonising geologists, such as William Buckland, his colleague at Oxford University William Conybeare and Adam Sedgwick at the University of Cambridge, were actually clergymen and considered to be 'diluvialists' (or students of the Deluge). All

108. Charles Lyell, *Principles of Geology, being an Attempt to Explain the Former Changes of the Earth's Surface by Reference to Causes now in Operation*, vol. 3 (London: John Murray, 1833), 267.

three, because of convincing new geological evidence, were, during their academic career, bravely to express diminishing confidence in the past occurrence of one *geological* Deluge as being responsible for most British geological features.[109] The term *geological deluge* came to be understood more broadly than that of the Mosaic Flood but was generally used to denote a sudden catastrophic event in recent geohistory which was either deemed to be too ancient to be equated with the biblical Flood event or for which the question of its date in relation to human history was simply ignored. It was used for the diluvial gravels that contained distinctive erratic pebbles and which were apparently carried in an inexplicable way, unrelated to the course of present rivers straight over watersheds between river systems, even leaving behind gravel deposits on summits of hills. The diluvial deposits became a topic of great interest during the 1820s and 1830s by which time the Ice Age theory emerged.

Warren Johns adds an extra dimension to the historiography of the British scriptural geologists by astutely revealing evidence of belief in a diminishing geological deluge amongst them. Johns gives striking examples of how British scriptural geologists "shifted the pre-Flood/Flood boundary higher and higher in the geological column."[110] He provides the case of George Fairholme (1789-1846) who shifted from the view that the Flood formed the entire fossiliferous geological column to the view that some of the deposits were actually antediluvian and limited the Flood to the upper portion of the geological strata. Johns provides two more examples of how British scriptural geologists in the late 1830s began to reduce the stratigraphic extent of the Flood. He discusses evidence in the cases of Biblicus Delvinus, most probably a pseudonym for George Bugg (1769-1851), and Samuel Best (1802-1873). Johns concludes that beyond 1850 no British scriptural geologist assigned any longer the majority of the fossil record to the Flood. He further notes that the scriptural geologists who started their writing careers after 1840 attributed less importance to the Flood

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109. I borrow the concept of the 'diminishing deluge' from Rodney Lee Stiling's Thesis "The Diminishing Deluge. Noah's Flood in Nineteenth-Century American Thought" (PhD diss., University of Wisconsin-Madison, 1991). Buckland announced his decision to drop the Deluge as a geological agent in a footnote of his famous 1836 Bridgewater Treatise. William Buckland, *Geology and Mineralogy Considered with Reference to Natural Theology*, vol. 1 (London: William Pickering, 1836), 94-5. According to Hallam (*Great Geological Controversies*, 52) William Conybeare also "backtracked from his earlier belief in the existence of the Mosaic Deluge." William D. Conybeare, "An Examination of the Phenomena of Geology, which Seem to Bear Most Directly on Theoretical Speculations," *Philosophical Magazine* 9 (1831): 190. Just six years after he had strongly argued for the evidence of the Mosaic Deluge, Sedgwick recanted this to the members of the Geological Society. Adam Sedgwick, "Address to the Geological Society, delivered on the Evening of the 18th February 1831," *Proceedings of the Geological Society of London*, November 1826 to June 1833: 1 (1834): 312-4.

110. Warren H. Johns, "Scriptural Geology, 1820-1860: An Essay and Review," *Origins* no. 62 (2008), 45.

in the stratigraphical column than the earlier writers, and that scriptural geology as a whole started to shift its emphasis away from facts and moved more into the "realm of speculation" [geological theories interpreted from a Creationist point of view].[111] This is interesting given the Baconian 'anti-hypothesis' mindset prevailing among this group. Although the shift to a diminishing geological deluge had started as early as the 1830s, Johns argued that the recognition of the effects of the Ice Age by the 1860s had removed the need of the Flood as a geological agent amongst the harmonising *and* the scriptural geologists in Britain. Although the American geological harmonisers would follow a similar course, the American scriptural geologists would most certainly not follow this trend.

2.3.2 A Shifting Geological Epicenter

During the early nineteenth century, North America was still very disconnected from the high-level scientific debate in Europe. The new world had however become a valuable source of new observations and specimens for travelling geologists who visited the area. At the end of the first decade of the nineteenth century, "American geology started to bud off from British geology."[112] Geology was initially driven by time-consuming surveys which constructed inventories of the rocks of the new world. In 1809 the Scottish immigrant William Maclure published a landmark geological paper, "Observations on the Geology of the United States, explanatory of a Geological Map" (see fig. 2.2).[113] The publication of the first geological map of the United States earned William Maclure the little-known title, "father of American geology."[114] Maclure had adopted Werner's nomenclature and distanced himself from any biblical connotations by stating,

> I do not mean to enter into the origin of first creation of the different substances, or into the nature and properties of the agents which may have subsequently modified or changed the appearance and form of those substances; I am equally ignorant of the relative periods of time in which those modifications or changes may have taken place; such speculations are beyond my range, and pass the limits of my inquiries.[115]

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111. Johns, "Scriptural Geology," 53.

112. Rodney Lee Stiling, "The Diminishing Deluge. Noah's Flood in Nineteenth-Century American Thought" (PhD diss., University of Wisconsin-Madison, 1991), 21.

113. William Maclure, "Observations on the Geology of the United States, explanatory of a Geological Map," *Transactions of the American Philosophical Society* 6 (1809).

114. See Alexander M. Ospovat, "Werner's Influence on American Geology," *Proceedings of the Oklahoma Academy of Science* 40 (1960): 99. Ospovat cites George P. Merrill, *Contributions to the History of American Geology* (Washington: Government Printing Office, 1906), 217.

115. William Maclure, "Observations on the Geology of the United States," 427; It is possible that Maclure studied under Werner (Ospovat, "Werner's Influence on American Geology," 99). Not only Maclure but most leading early nineteenth century American geologists followed Werner's classification. Benjamin Silliman, Parker Cleaveland, and Amos Eaton became convinced that Werner's classification and terminology

In 1810, the *American Mineralogical Journal* was established, and in 1818, Benjamin Silliman established the *American Journal of Science*.[116] Newell argues that based on an increasing number of American geological publications, 1820 was a useful date for the commencement of the growing independence of American geology from its European influences.[117]

During much of the nineteenth century, European geologists had intensely debated the origins of mountain ranges, and most specifically the complex folded structure of the Alps. Because of the revolution in information exchange, these debates inevitably spilled over to the North American continent. From the 1840s onward American geologists had become deeply involved in a similar discussion on the Appalachian mountain range. Foremost among these were the brothers Henry Darwin Rogers (1808-1866) and William B. Rogers (1804-1882), James Hall (1811-1898), and James Dwight Dana (1813-1895).[118] American geologists visited their European counterparts, and exchanged views on global orogenic theories.[119] By mid-century European geologists had already clearly recognised and began to respect the American geologists' work. During the later decades of the nineteenth century, the work of American geologists Grove Karl Gilbert (1843-1918), Clarence Dutton (1841-1912), Bailey Willis (1857-1949), and Thomas C. Chamberlin (1843-1928), on the formation of the American mountain ranges was recognised as a valuable contribution to discussions on global tectonics. It can be argued that during the second half of the nineteenth century the epicentre of geological thought gradually shifted from the European to the American continent.

Geology and Religion in North America

Through the early decades of the nineteenth century, American theologians had felt quite secure that Baconian and Common Sense ideals provided a defence against religious skepticism. However, geological thought started to weaken the Common Sense defence.

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was the indispensable basis for the mapping of the North American geology for the time. This favourable appreciation would contrast sharply with George McCready Price's low opinion of Werner's classification (see chapter 6).

116. Stiling, "The Diminishing Deluge," 21-2.

117. Julie R. Newell, "American Geologists and their Geology: The Formation of the American Geological Community, 1780-1865" (PhD diss., University of Wisconsin-Madison, 1993), 110.

118. See Mott T. Greene's chapter on 'The Debate in North America, 1840-1873' in Mott T. Green, *Geology in the Nineteenth Century: Changing Views of a Changing World* (Ithaca, NY: Cornell University Press, 1982).

119. Relating to processes of mountain formation.

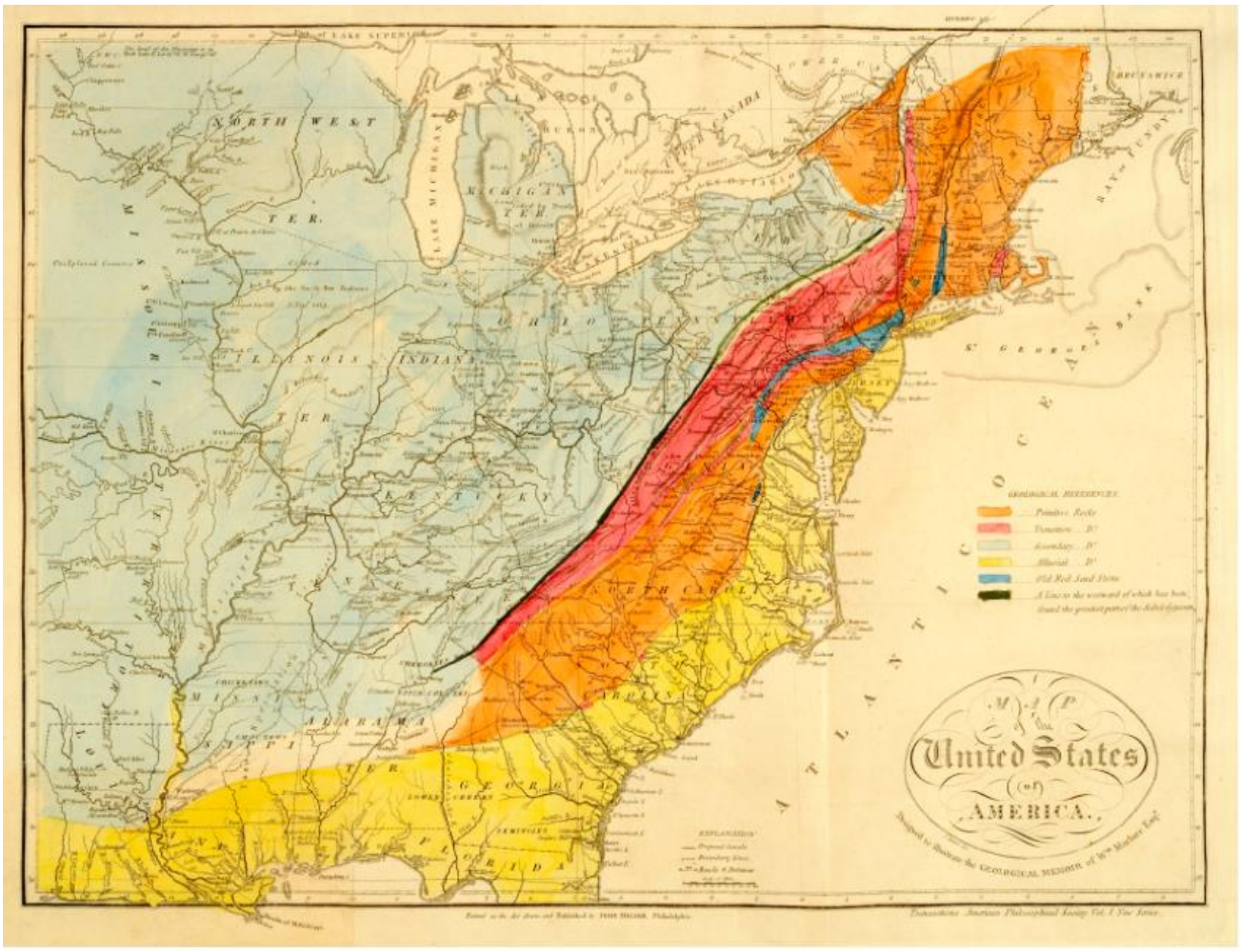


Figure 2.2. Maclure's 1817 geological map of the United States. Revised, larger version of the map that Maclure originally had published in the *Transactions* in 1809. The legend was based on Werner's rock classification scheme and showed: Primitive rocks (orange), Transition rocks (red), Secondary rocks (light blue); Alluvial deposits (yellow), and Old Red Sandstone (Dark blue).

Source: Transactions of the American Philosophical Society, 1 (new ser., 1818). (www.libweb5.princeton.edu)

Kamen observes that "during the 1830s, 40s, and 50s, the new science of geology appeared to flout the rules of the Common Sense theology more than other departments of knowledge, as far as most American thinkers were concerned."[120] What worried orthodox theologians was that modern geologists made little or no reference to any special creative acts of God in the creation of the Earth. Also of concern was their supposition that the age of the earth was numbered in the millions of years, thereby discarding the 6000-year biblical chronology. In the mid-1830s, the Congregationalist biblical scholar Moses Stuart "compared the modern

120. Kamen, "The Science of the Bible," 181.

science of geology to modern biblical criticism in Germany and, so, connected geology to the uneasiness many Americans felt" concerning the German biblical scholars.[121] There was the fear that geology might lead to religious skepticism or even atheism. Stuart thus characterised the theories of modern geologists as arbitrary, speculative, and often mutually contradictory; he saw nothing but conjecture and uncertainty among geologists.[122]

As earlier noted, throughout the seventeenth and most of the eighteenth century, the Genesis Flood had provided plausible theoretical models in natural history. However, geological fieldwork in the nineteenth century led to an increasing need to redefine the significance and extent of the Flood. In 1839, the New England geology teacher Frederick Hall (1780-1843) noted that fifty years ago no one had doubted the work of the Flood.

> Wherever a deep gorge was noticed between two mountains or hills – wherever a coal bed was discovered—wherever a petrified log or fish was seen, whether on an extensive plain or on the Pyrenees, the Alps or the Andes, there the naturalist, as well as the theologian, would promptly remark, 'there are the visible effects of the Noachian deluge.[123]

However, Hall went on to say that, hardly fifty years later Christian geologists were claiming, ". . . that *no* certain traces – no distinct footmarks of the scripture flood are to be found on the face or in the crust of our planet."[124] Stiling concludes that by the 1840s, "American [expert] geologists had generally abandoned the Flood as a scientific explanation and certainly the major [scientific] debates about the extent and nature of the Flood – and the structure of the geological column – were mainly settled before the appearance of the *Origin of Species* in 1859."[125]

Like Great Britain, North America had eminent harmonisers that were committed to establishing harmony between Genesis and geology. The most well-known representatives of the American harmonising geologists were Benjamin Silliman (1779-1864), Edward

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121. Ibid., 185; M. Stuart, "Critical Examination of Some Passages in Gen. I.; With Remarks on Difficulties that attend some of the Present Mode of Geological Reasoning," *Biblical Repository and Quarterly Observer,* no. XXI (January 1836): 46-7.

122. Kamen, "The Science of the Bible," 189; Stuart, "Critical Examination of Some Passages in Gen. I," 83.

123 Rodney Stiling cites this quote ascribed to Frederick Hall in the introduction of his thesis "The Diminishing Deluge," 1. Frederick Hall was the editor of Von Leonhard's *Popular Lectures on Geology*. Karl Caesar von Leonhard, *Popular Lectures on Geology, Treated in a very Comprehensive Manner*, trans. J. G. Morris and. ed. Professor F. Hall (Baltimore: N. Hickman, 1839), 351-2.

124. Stiling, "The Diminishing Deluge," 1. Frederick Hall's remarks in: Von Leonhard, *Popular Lectures on Geology*, 351-2

125. Stiling, "The Diminishing Deluge," 6, 15.

Hitchcock (1793-1864), the Swiss immigrant Arnold Guyot (1807-1884), James Dwight Dana (1813-1895), the Canadian Sir John William Dawson (1820-1899), and George Frederick Wright (1838-1921). Silliman and Hitchcock both stand out when considering their contributions towards reconciling Genesis and geology in the first half of the nineteenth century. Both were equally dedicated to the domains of professional geology and theology. They remained so in the face of newly emerging geological findings. It is not difficult to see strong similarities between them and their British harmonising counterparts.

Rodney Stiling investigated the changing models of harmony as used by Edward Hitchcock and his colleagues during the first half of the nineteenth century.[126] In discussing American references to geology and the Flood up to 1820, Stiling notes that "before 1800 one finds only sporadic references to Noah's Flood in American works on earth history." Only at the beginning of the nineteenth century did American writers "consider the Flood to be historical fact and to have been worldwide in scope."[127] Like their European counterparts in the early decades of the nineteenth century, American writers had been strongly influenced by the thinking of the French palaeontologist Georges Cuvier's *Discours Préliminaire sur les Révolutions du Globe* (1812) and the evidence of *multiple* catastrophes. However, some first-generation nineteenth century American geologists such as Parker Cleaveland and William Maclure decided to refrain from conjectures regarding the Flood given the emerging challenges in the geological data.

Stiling breaks down the perception of a diminishing deluge in American geology into several phases. The first American-trained geologist, Amos Eaton (1776-1842), fearlessly put forward the geological certainty of the Noachian Deluge in his 1818 *Index to the Geology of the Northern States*.[128] During the 1820s interest in the Flood grew and with the assistance of the Flood debates conducted by the geologist Benjamin Silliman, the Flood "became now of interest to American geological thinkers at the highest level."[129]

During the 1824-1835 decade, the Genesis Flood was still generally perceived as the diluvial deluge. Beyond 1835, there was a reinterpretation whereby the Genesis Flood was no longer automatically interpreted as the universal diluvial deluge. This global concept gradually changed into that of a partial deluge with the concurrent, initially hesitant,

126. Ibid., 30-5.

127. Ibid., 33.

128. Ibid., 38-40.

129. Ibid., 43.

acceptance of the possibility of glacial episodes.[130] What had universally been perceived as diluvial gravel, was increasingly reinterpreted as glacial drift left behind by the fluctuating expansions of continental-scale glaciers.

These challenges were to present a dilemma for the harmonising geologists in North America. The appointment of Benjamin Silliman to the Professorship of chemistry and natural science at Yale University was a very significant landmark in the history of American geology. As a 'Wernerian' he was to teach the subject to many Americans and give popular lectures throughout the eastern states.[131] Silliman was one of the first harmonising geologists who "gave careful and sustained attention to the reconciliation of geology and religion."[132] Stiling describes Silliman as "no theological liberal" who "reinterpreted the Bible by adopting a 'day-age' harmonising scheme for Genesis and geology that was at the time popular in Europe."[133] Silliman, like Eaton and others, remained confused, however, about precisely what geological results to attribute to the Genesis Flood. Edward Hitchcock (1793-1864), a student, colleague and friend of Benjamin Silliman and believer in the Genesis Flood was likewise to be challenged in this area.

Hitchcock was undoubtedly an important figure in nineteenth century American science. He contributed significantly to the fields of geology, palaeontology, and palaeoichnology (the study of fossil bird tracks that were later interpreted as dinosaur tracks). He developed the notion of the "Christian Geologist" who would be committed to reconciling geological facts with the Mosaic narrative.[134] He supported Chalmers's gap theory to reconcile Genesis and geology. In the period between the 1820s and 1850s, Hitchcock would experience a dramatic change in his perspective on the relationship between the geological phenomena and the biblical account of Noah's Flood. During the 1820s, he could still confidently state that "the geological evidence for the Genesis Flood appeared as strong and convincing as the historical evidence."[135] However, by 1851 Hitchcock would express the general sentiments of the American geologists in declaring of the Flood that "those best qualified to judge now doubt whether it be possible to identify one mark of that event in

130. Ibid., 30-5.

131. Ospovat, "Werner's Influence on American Geology," 100.

132. Stiling, "The Diminishing Deluge," 45.

133. Stiling, "Scriptural Geology in America," 179.

134. See Ariel Jacob Segal, " 'Scientific Truth, Rightly Understood, is Religious Truth': The Life and Works of Reverend Edward Hitchcock, 1793-1864" (master's thesis, University of Maryland, 2005), 1.

135. Stiling, "The Diminishing Deluge," 51-2.

nature."[136] However, during the 'erosion' of the geological evidence for the Flood, he would continue to believe strongly in the reality of the Genesis Flood. Hitchcock's experience thus closely echoed William Buckland's increasing doubts over a geological Deluge during his geological career at Oxford. Like Silliman, Hitchcock was convinced that "without input from geologists who were 'disposed to reverence the scriptures', no *mere* divine, no *mere* critic in language" could possibly get Genesis right.[137]

Early nineteenth century American geology, just like its European counterpart, used abundant anti-theory rhetoric but was never totally free of implicit theoretical thinking. Newell states that, "Geologists wanted not grand systems built on the sand of speculation but sound theories founded on the rock of facts – or the facts of rock."[138] It showed that theory could not be disconnected from observation and data collection during fieldwork. Newell further explains that, "Identification of rock strata, construction of nomenclatures, correlation of distant formations, and depiction of stratigraphic units in maps and sections all required high levels of theory-based activity and elicited explicit discussions of the theoretical foundations of practice."[139] Geology in America, therefore, included both "gathering and correlating stratigraphical information for broad areas of the continent and formulating theories to account for the large-scale disturbances clearly undergone by the strata." [140] The emphasis on fieldwork in this process contrasts sharply with the opinion of nineteenth-century churchmen who felt justified in discussing and critiquing the findings of professional geologists. Their perception of the common sense nature of geology survived long after it had stopped being a common sense science. While some criticism of the emerging place of theory in the natural sciences had initially come from the scientists themselves, it was the American Scriptural Geologists who were the most outspoken critics in that field by the mid-1800s.

The Troika of American Scriptural Geologists

There were three major Scriptural Geologists in North America during the 1817-1857 period; Eleazar Lord (1788-1871), David Nevins Lord (1792-1880), and Martyn Paine (1794-1877). All three happened to reside in New York City. Stiling astutely observes that "all

136. Edward Hitchcock, *The Religion of Geology and its Connected Sciences* (Boston: Phillips, Sampson, 1851), 122.

137. See Stiling, "Scriptural Geology in America," 180.

138. Newell, "American Geologists and their Geology," 174.

139. Ibid., 176.

140. Ibid., 177.

[Scriptural geologists] wrote in objection to the reconciling trend [of the harmoniser geologists], and all three wrote before the advent of Darwinism."[141] American scriptural geology was therefore *not* about combating Darwinian evolution.

Around the late 1830s, Eleazar Lord had anonymously published material against the "hypothesis of geologists respecting the creation," which he understood to be the joint conceptions of an old earth and a limited or insignificant Flood.[142] This work was specifically a critique of William Buckland's Bridgewater Treatise, in which Buckland had attempted to harmonise geology with scripture and in the process conceded a limited Flood. Lord rejected this attempt to harmonise geology with scripture and urged a strict adherence to the Mosaic narrative.[143] He also strongly argued against the gap theory on the basis of the Fourth Commandment, urging that Sabbath day observance "could not have been prescribed, had the heavens and earth been created myriads of ages before the creation of man."[144] Lord felt strongly that the age of the earth should be interpreted in the light of Scripture and *not* by extra-biblical reasoning. The big problem with theoretical geology was, according to Lord, the use of extra-biblical epistemology and the naturalistic methodology of science, each of which avoided the necessity of miracles.

Edward Hitchcock's publication of his classic science-reconciliation text, *Religion of Geology and Its Connected Sciences* (1851), triggered strong reactions from scriptural geologists in the United States. Hitchcock had stated that to insist on miracles as a possible factor in earth history was to preclude scientific investigation. Eleazar Lord strongly disagreed; he did not believe that the infidel assumptions, hypotheses, and inferences could explain the formation of the rocks of the earth.[145] Instead, he was convinced that the deposition of the sedimentary strata and their subsequent upheaval "was possible, and

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141. Stiling, "Scriptural Geology in America," 181.

142. [Eleazar Lord?], "Epoch of the Creation," *Literary and Theological Review* 4 (1837): 526. Eleazar Lord's chosen titles for his 1837 article and his 1851 book *The Epoch of Creation* show an interesting contrast with *Les Époques de la Nature* [The Epochs of Nature] (1778) by the French savant George-Louis Leclerc, Comte de Buffon. Buffon was a man of great repute and influence in France and his book was an immediate sensation. François Ellenberger, in *Histoire de la Geologie*, described Buffon's book as "a visionary history of the world". Buffon identified seven "Époques" or successive living worlds. It is not hard to imagine that Eleazar Lord wanted to distance himself from Buffon's evolutionist ideas by choosing a title that emphasised his strong creationist perspective.

143. "Epoch of the Creation," 526-38.

144. Eleazar Lord, *The Epoch of Creation: The Scripture Doctrine contrasted with the Geological Theory* (New York: Charles Scribner, 1851), 58-9.

145. See Eleazar Lord, *The Epoch of Creation*, 144, 148.

possible without any greater miracle than that of a universal deluge."[146] Lord "assigned the surface drift phenomena, the coal beds, and all of the sedimentary strata to the period associated with the Flood."[147]

David Lord, a brother to Eleazar, became known for establishing and editing the quarterly *Theological and Literary Journal* in 1848 and his publication of a book entitled, *Geognosy, or the Facts and Principles of Geology against Theories,* in 1855.[148] The *Journal* was used to question the geologists' underlying assumptions, to highlight the miraculous possibilities of a sovereign God, and to place divine revelation, as it appeared in the sacred *Holy Scripture*, in a position of *primacy* over natural science. There was a strong belief that both 'theoretical geology' and the 'higher criticism' of Scripture "worked in tandem to undermine the God-breathed authority of His Written Word."[149]

"Geognosy" was obviously chosen as the main title for David Lord's book to emphasise the importance of describing the composition and arrangement of the materials of the earth without recourse to speculative theories. It was a term used by A. G. Werner in connection with a factually based rock classification. The "facts" in David Lord's book title related to the observable geological phenomena; the "principles" pointed to the belief in the Bible as a guide to geological problem solving; and the "theories" included the emphasis on geological causes now in operation, the erroneous theories of an old earth and a gradual creation. The book's viewpoint was that Genesis and geology were mutually contradictory. Thus, according to Ronald Numbers, "the decision to accept or reject geology thus took on profound theological significance."[150] Numbers cites the following quote from David Lord's *Geognosy* to emphasise this point:

> If founded on just grounds, [geology] disproves the inspiration, not only of the record in Genesis of the creation, but of the whole of the writings of Moses, and thence . . . of the whole Old and New Testaments, and divests Christianity itself of its title to be received as a divine institution.[151]

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146. Ibid., 240.

147. Stiling, "Scriptural geology in America," 181; Eleazar Lord, *The Epoch of Creation*, 230-240.

148. David N. Lord, *Geognosy or the Facts and Principles of Geology against Theories* (New York: Franklin Knight, 1855).

149. Tison, "Lords of Creation," 166.

150. Ronald L. Numbers, *Darwinism comes to America* (Cambridge, MA: Harvard University Press, 1998), 96.

151. David Lord, *Geognosy*, 14-5; Quoted by Numbers in *Darwinism comes to America*, 96.

During most of their writing careers, the two brothers did not consider geology a real science and continued to question the theories and logical nature of geology. They outlined its contradictions with biblical scripture and provided alternative Bible-based interpretations.[152] Instead of basing geology on fieldwork, they constructed their own versions of scriptural geology based on an *a priori* commitment to their own interpretations of Mosaic cosmogony.

Dr. Martyn Paine (1794-1877) was a Harvard-educated medical doctor who equally strongly opposed modern geology. Paine was supportive of the views of the two Lord Brothers and, in contrast to the critique of several journals which suggested that their manner was brusque, actually praised their "spirit of forbearance and courtesy."[153] Paine's first thoughts of a scriptural-geological nature can be found embedded in *A Discourse on the Soul and Instinct, Physiologically distinguished from Materialism* (1849), where he emphasises the importance of the 24-hour days in the Creation week and strongly connected his argument with the Fourth Commandment. Paine discloses that he had prepared "a large work upon the subjects, in which all the facts of importance in Geology up to that period are reviewed, and none of them found, in my judgment, to conflict with the most obvious interpretation of the Narratives."[154]

His second scriptural-geological work was an article entitled, *A Review of Theoretical Geology*, which appeared in the *Protestant Episcopal Quarterly Review* of 1856.[155] The article examines geological facts with reference to the Mosaic records to which he had referred in his 1849 book. It contains a review of several geological theories such as uniformity, neptunism, and plutonism, and in the latter part of the lengthy article, he deals extensively with the general Deluge and coal formations. In his 1872 book, *Physiology of the Soul and Instinct, as distinguished from Materialism, with Supplementary Demonstrations of the Divine Communication of the Narratives of Creation and the Flood*, Paine further expands on the earlier topics such as theoretical geology, the occurrence of a general deluge

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152. On the origin of the fossil-bearing strata, David Lord differed from his brother Eleazar. David did not accept a diluvial solution, but favoured a scheme that recognised stratification of rocks *before and after* the Flood. See Ronald L. Numbers, *The Creationists: From Scientific Creationism to Intelligent Design*, exp. ed. (Cambridge, MA: Harvard University Press, 2006), 31-2.

153. See Stiling, "Scriptural Geology in America," 183.

154. Martyn Paine, *A Discourse on the Soul and Instinct: Physiologically distinguished from Materialism: Introductory to the Course of Lectures on the Institutes of Medicine and Materia Medica, in the University of the City of New York, Delivered on the Evening of Nov. 2, 1848* (New York: Republished by E. H. Fletcher, 1849), 167.

155. Martyn Paine, "A Review of Theoretical Geology," *Protestant Episcopal Quarterly Review* 3 (April 1856): 161-281.

instead of an Ice Age, the importance of the Fourth Commandment (Sabbath rest), and the coal fields as "the greatest monumental proof of a desolating and universal Flood."[156]

Both the Lord brothers and Martyn Paine used the term "theoretical geology" in a pejorative fashion to criticise the assumptions that sediments of the fossiliferous strata were deposited under relatively uniform and tranquil conditions. The suggestions of an ancient earth and limited effects and extent of the Flood were totally unpalatable to them. Paine abhorred the theological implications of modern geology and was convinced that this was opening the door for widespread infidelity. Instead, Paine strongly promoted a literal understanding of the Creation and Flood narratives, and a young earth as shown below.

> The fruitful topics relative to the extent and orderly disposition of fossils and fossiliferous rocks, the general details attending the incrustation of the globe, the numerous and complicated enigmas of the coal formations, must be resolved according to natural laws; the Neptunian and Plutonic hypotheses must be disproved, and the Creation of the earth, according to the Narrative, placed upon such probabilities as shall not conflict with Nature, though brought within the time assigned by the Mosaic Narrative. The Mosaic Genealogies of the human race must also be sustained, and must be shown that there is nothing in Geology to contradict the supposed age of the earth as founded upon the Genealogies.[157]

He explicitly attributed the stratified fossil-bearing rocks to a world-wide Flood. This view was based on a combination of the evidence of the Old Testament account of the Flood in Genesis, the New Testament references to the Flood by Jesus and the apostles, and the coal formations. Paine argued that all the forests of the globe would have been uprooted by the Flood. Stiling outlines Paine's ideas of the Flood as follows:

> . . . these floating forests were then washed up unto the North American continent, he speculated, by cataclysmic oceanic surges from the southeast and then buried in the sediments that precipitated from the waters as the Flood calmed. By analogous processes all the sedimentary layers were formed, but the coal formations, he felt bore a special witness to the effect. In this way, the Flood could be enlisted to explain the entire set of fossil-bearing sediments.[158]

The following quote from Paine corroborates Stiling's assessment:

> . . . No small array of geological facts, and fundamental principles in science, may be brought to the disproof of all theories which conflict with the obvious interpretation of the primeval history of the earth and its inhabitants down to the time of Moses. Indeed, there is abundant evidence in the coal formations alone to subvert the whole

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156. Martyn Paine, *Physiology of the Soul and Instinct as Distinguished from Materialism. With Supplementary Demonstrations of the Divine Communication of the Narratives of Creation and the Flood* (New York: Harper, 1872): 654.

157. Paine, *Discourse on the Soul and Instinct*, 167.

158. Stiling, "Scriptural geology in America," 184-5.

> system of theoretical Geology, so far as it conflicts with the Mosaic statements; and the primitive rocks bear an overwhelming testimony that 'He spoke and it was done.'[159]

Scriptural geology seemed destined to die a normal death with the passing of the troika of promoters of this genre of apologetic literature. By the end of the American Civil War all three were already in their 70s. Stiling aptly characterises the American scriptural geologists as follows:

> While the Scriptural Geologists were skilled writers and editors who sometimes exhibited scholarly and penetrating insight, their practical experiences were drawn from the railroad and insurance business and from academic medicine. They were not, it turns out, geologists at all.[160]

In comparison to the impact of the American scriptural geologists, the legacy of the harmonising geologists persisted much longer. Stiling gives some reasons for this tendency. The harmonising geologists were more influential than the scriptural geologists because of their academic positions at well-known institutions and Silliman's *American Journal of Science* assisted in extending their views to a larger audience. Hitchcock was a leading practising geologist who became the author of the first comprehensive American geology textbook and was elected president of the Association of American Geologists and Naturalists. However, more importantly, another generation of geologists continued the reconciliatory view towards geology and Genesis. James Dwight Dana (1813-1895), Silliman's student and son-in-law, was a deeply religious man and one of the leading [American] geologists of the entire century.[161] Dana succeeded Silliman as editor of *The American Journal of Science* and also became a professor at Yale. Dana became well-known for his adherence to the day-age reconciliation schema reminiscent of Silliman's view. His pioneering studies of mountain-building, volcanic activity, and the structure of continents and oceans have greatly contributed to present-day geological knowledge.

Two other distinguished geologists, the Canadian John William Dawson (1820-1899) and the Congregationalist and editor George Frederick Wright (1838-1921) also remained ardent supporters of the reconciliation of Genesis and geology. Some of William Dawson's books on geological subjects maintained a distinctly theological orientation during his life.

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159. Paine, *Discourse on the Souls and Instinct*, 168.

160. Stiling, "Scriptural geology in America," 186-7.

161. Ibid., 186.

Frederick Wright was a well-respected geologist who eventually became a professor of *Harmony of Science and Revelation* at Oberlin Theological Seminary. He wrote prolifically on topics of geology, history, and theology and through his contributions to *The Fundamentals*, he became a fundamentalist spokesman in the early twentieth century.[162] The highly respected harmonising professionals with reputed expertise, integrity, and piety promoted geological compatibility on the basis of nonliteral creative days of Genesis and a regional non-universal Genesis Flood. Most of all, Silliman, Hitchcock, Dana, Wright, and Dawson were actually practicing and publishing geologists.

2.4 The Engagement *Mise-en-scène*

It is interesting to note that the emerging geology of the nineteenth century faced opposition not only from the scriptural geologists but also from the scientific community. To understand why this was the case it may be helpful to consider various cognitive geological styles and approaches to Scripture that existed during the nineteenth century. This will also help in understanding the developing engagement between geological and Adventist thought. This may answer such questions as what types of geology practitioners existed; what type of scientist they were; and what options were there for orthodox Christian denominations to engage with the challenging new sciences? The next section briefly explores the ambient milieu and vital actors of the engagement.

2.4.1 Cognitive Geological Styles and Approaches to the Scriptures

Martin Rudwick made an attempt to classify the different approaches to earth science or geology in the nineteenth century regarding the 'different ways of thinking' or 'cognition' evident amongst the practitioners of the emerging discipline.[163] He identified so-called 'cognitive styles': the *abstract*, the *concrete*, the *agnostic*, and the *binary* style. Pictorial representations of these styles, shown in figure 2.3, help one to appreciate the distinguishing characteristics of the styles as well as some of the similarities. In practice, a geologist would not necessarily exhibit only one style but may exhibit two or more styles. The kind of nineteenth century geologist whose style was predominantly, *abstract, concrete, agnostic,* or *binary* was the *theorising* geologist, the *classification* geologist, the *exploration* geologist, or the *scriptural* geologist respectively.

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162. Ronald L. Numbers, "George Frederick Wright: From Christian Darwinist to Fundamentalist," *Isis* 79, no. 4 (December 1988): 624.

163. Martin J. S. Rudwick, "Cognitive Styles in Geology," in *Essays in the Sociology of Perception*, ed. Mary Douglas (London: Routledge and Kegan Paul, 1982), 219-41.

The scriptural geologist was a strong representative of the binary style of thinking in that earth history was seen as divided into two stages; that before the biblical flood, and that after the biblical flood. The theorising geologist was interested in establishing a global picture of Earth history and was not so much interested in local geological formations and rock layers. Both geologists were interested in interpretation rather than empiricism and in establishing causal mechanisms for earth history. However, the scriptural geologist focused on the data from an ancient text whereas the theorising geologist focused on the data resident in the earth.

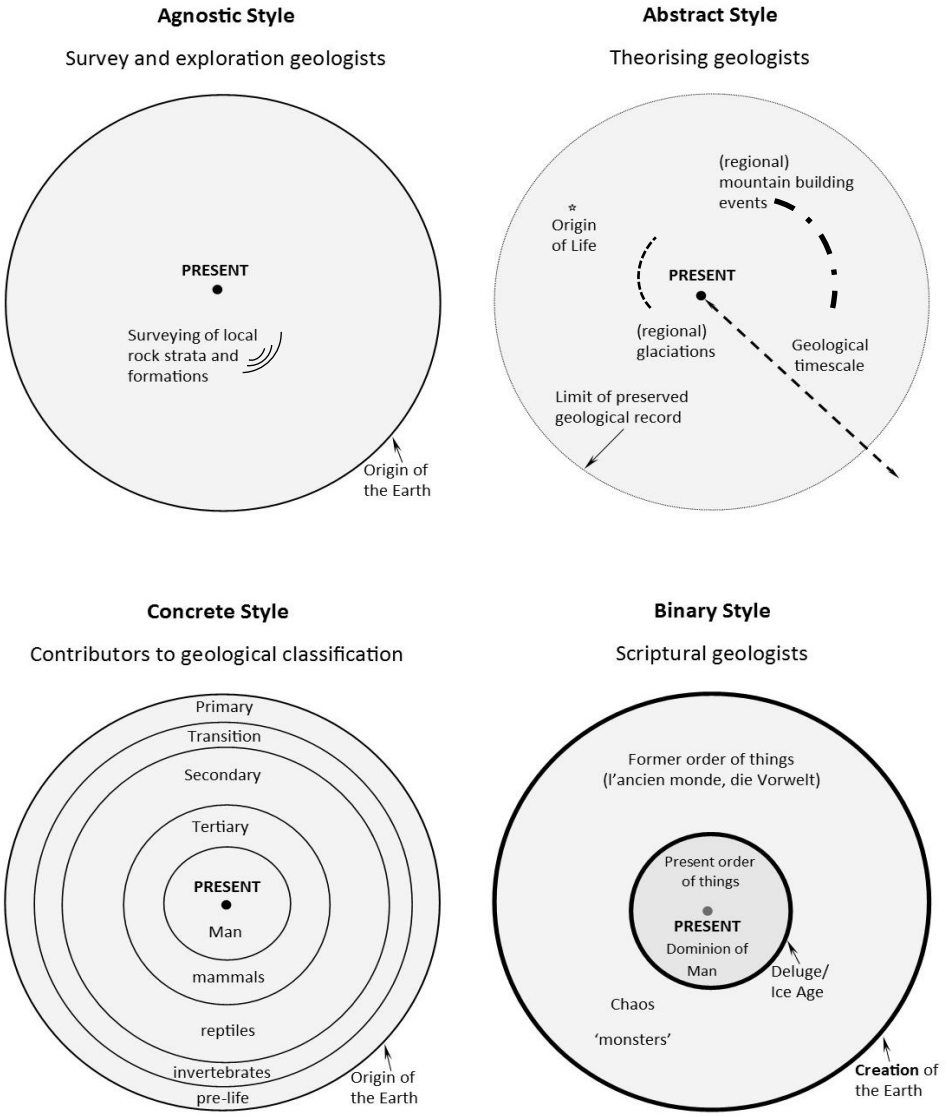


Figure 2.3. Nineteenth century cognitive styles in geology modified from Rudwick (1982). An additional diagram for the Agnostic style was added to the three redrawn from Rudwick.

Source: Martin J. S. Rudwick, "Cognitive Styles in Geology," in *Essays in the Sociology of Perception*, ed. Mary Douglas (London: Routledge and Kegan Paul, 1982), 219-41.

The classification geologist was devoted to determining the properties that distinguished one rock layer from another and determining the order in which the various rock layers were deposited. It was in this sense that the style of thinking was concrete as opposed to abstract. Practical experience gained from long working hours in the field was required. These were the hallmarks of the emerging discipline of geology in the nineteenth century which began to create a boundary rather resistant to ideas from outside the discipline.

The discipline for the scriptural geologist was the sacred text that had also become resistant to external change. The horizon for the exploration geologist was local rather than global and, like the classification geologist, depended on many hours of practical experience equipped with a geological hammer, hand lens, geological compass, notebook, and sample bag in the field. The style of thinking was agnostic in the sense that there was an ambivalence to a theory of earth history. The boundaries defining the thinking style of the exploration and theorising geologist were not as resistant to external influences as was the case for the scriptural and classification geologist.

According to scriptural geologists, practising geologists were not engaged in the 'discipline of science' like practising physicists and chemists. Geology seemed to be populated with wild speculation, hypotheses, and theories and lacked the precision of physics and chemistry. It should, of course, be remembered that such accusations had also been made by practising physicists and chemists of their own disciplines in their historical development. Both Priestley and Lavoisier were committed to a discipline of 'facts only', but the irony was that Priestley and Lavoisier depended on the ideas of 'phlogiston' and 'caloric' respectively to explain their observations.[164] However, the scriptural geologists did have a point in suggesting that geology was different in some sense to physics and chemistry. As previously discussed, geologists responded to such accusations both from within the geology movement and from without by increasing its observational and related fieldwork status.

The 'uniformitarian' proposition put forward by Charles Lyell was designed to add precision to the discipline by increasing the capacity of the discipline to predict the geological past.[165] Apart from these efforts, however, there remained distinct differences between the

164. Kevin C. de Berg, "Teaching Chemistry for all its Worth: The Interaction between Facts, Ideas, and Language in Lavoisier's and Priestley's Chemistry Practice: The Case of the Study of the Composition of Air," *Science & Education* 23, no. 10 (2014), 2045-68.

165. Although the actualistic proposition is frequently attributed to Lyell, the idea was not at all original and had been expressed in similar words by many before him during the eighteenth century (Ellenberger, *Histoire de la Géologie*, 11).

traditional sciences and geology, differences particularly noted by a Christian movement being challenged by the findings of the new geology. However, the challenge was not only experienced by some in the Christian movement but also by some in the sciences. Dolphin and Dodick commented that this trend has continued in recent times where "some scientists do not accept the methodological diversity of the sciences and specifically disparage the earth sciences as being less scientific than the physical sciences."[166]

Apparently, the differences were not well articulated until the twentieth century. It was then that the earth sciences along with evolutionary biology were classified as 'historical sciences' as distinct from 'experimental sciences' because they "developed specific methodologies to cope with problems that could rarely be tested under controlled laboratory conditions."[167] This does not mean that controlled experiments are not part of some branches of modern geology such as geochemistry and geophysics, but the overall philosophical flavour or style of thinking seems to fit well into the 'historical science' category. It is evident that 'hypotheses' are important in both the experimental and historical sciences for the growth of scientific knowledge. However, while a single working hypothesis might apply to an experimental science like physics, 'multiple working hypotheses' have been of more value in historical sciences like geology. Dolphin and Dodick pointed out that because earth science "focuses on complex natural systems, which are often the result of several irreducible causes, . . . the application of multiple working hypotheses makes it more likely that a scientist will see the interaction of the several causes."[168] So, while some scientists such as Priestley, Lavoisier, and some geologists at the beginning of the nineteenth century eschewed the role of hypotheses in knowledge generation, it is the very existence of hypotheses across the spectrum of the sciences that has led to the explosion of scientific knowledge. However, it has been the inherent differences between the experimental and historical sciences that have led some Christians and some scientists to question the legitimacy of the historical sciences.

2.4.2 Key Adventist Role Players

Ellen White, Uriah Smith, Alonzo T. Jones, and George McCready Price became the key Adventist role players in the engagement between geological and Adventist thought from

166. Glenn Dolphin and Jeff Dodick, "Teaching Controversies in Earth Science: The Role of History and Philosophy of Science," in *International Handbook of Research in History, Philosophy, and Science Teaching*, vol. 1, ed. M. R. Matthews (Dordrecht: Springer, 2014), 557.

167. Dolphin and Dodick, "Teaching Controversies in Earth Science," 557.

168. Ibid., 564.

the mid-1850s to beyond the turn of the century. They influenced the nature and remarkable longevity of the engagement.

Ellen White (1827-1915)

Ellen White was one of the first three pioneers present at the birth of the Seventh-day Adventist Church. She proved to be a major influential force that inspired the denomination to develop from just a few people in the North-east United States of America of the nineteenth century to a church that has progressively spread across the entire world. Her influence on the growing congregation cannot be overestimated. Through her visions, she was (and is) seen by many Adventists as a present-day prophetess who illuminated the Scriptures and led people to the Bible.

Only on a few occasions did Ellen White directly use the terms 'geology' or 'geologists' and instead spoke more often about the general relationship between science and religion. Of special importance here are her expressions of 'true science' and 'false science.' True science was understood to be science in harmony with Scripture. Science, falsely so-called – a phrase she borrowed from 1 Tim. 6:20 – was science "based on the conceptions and theories of men to the exclusion of the wisdom of God."[169] The true and false science contrast was instigated by the rapidly changing nature of science as opposed to the unchanging steadfast "unerring counsel of God." Her interpretation of the changing nature of science must be understood in the context of a shifting concept of scientific methodology during the nineteenth century from purely Baconian to one that favoured verifiable working hypotheses.

Because of the brevity of the descriptions of the Creation of the earth and the Mosaic Flood in the Bible itself, the added information from Ellen White through her recorded visions has been of particular interest to the Adventist Church. The official *Seventh-day Adventist Bible Commentary* discussed the need for additional information from inspired writers for a fuller understanding of the biblical Flood. The description of the Flood in the *Commentary* is therefore given as a combination of the biblical narrative plus the inspired writings of Ellen White. [170] The implications of these writings for the engagement of geological and Adventist thought are discussed in chapter 3.

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169. Gerhard Pfandl, "Ellen G. White and Earth Science," *Journal of the Adventist Theological Society* 14, no. 1 (Spring 2003): 181.

170. Francis D. Nichol, ed., *The Seventh-day Adventist Bible Commentary: The Holy Bible with Exegetical and Expository Comment*, vol. 1: Genesis to Deuteronomy (Washington, DC: Review and Herald, 1953): Genesis and Geology, 73.

Uriah Smith (1832-1903)

The influence of the written word on the spread of Adventism cannot be overestimated. In the summer of 1850, the first issue of the *Advent Review* appeared and by the end of 1855 the Adventist Sabbatarians had established their own publishing house in Battle Creek, Michigan.[171] The importance of the periodical for the growth of the new denomination becomes evident when one considers that initially the *Review and Herald* was the only sign of visible cohesion between the early Sabbatarian Adventists. Many lived scattered across the country and felt lonely without the periodical.[172] Some valued the weekly *Review and Herald* "next to the Bible as the dearest possession that nurtured their spiritual lives."[173] On June 4th, 1874 the first issue of *The Signs of the Times* under the same name as the earlier Millerite periodical was published on the west coast in Oakland California. Next to the *Review and Herald* this would become the other major denominational paper for conveying the Adventist message.

Uriah Smith was, in essence, a 'gate-keeper' for the articles from outside Adventism that would be published in the *Review and Herald*. In the spirit of the reigning nineteenth century philosophy of Common Sense Realism, his lack of formal tertiary education did not deter him from dealing with complex geological issues on an equal footing with international, professional geologists. Because of his long editorial service, Smith came to see himself "more as the journal's proprietor than as its editor."[174] As such, he considered himself to be a "guardian of denominational orthodoxy," who was not prepared to "flop over at the suggestion of every novice."[175] Chapter 4 extensively discusses the nature of Smith's role in the engagement between geological and Adventist thought.

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171. Milton Raymond Hook, *Flames over Battle Creek* (Washington, DC: Review and Herald, 1977), 26.

172. Eugene F. Durand, *Yours in the Blessed Hope, Uriah Smith* (Washington, DC: Review and Herald, 1980), 62.

173. Godfrey T. Anderson, "Sectarianism and Organization 1846-1864," in *Adventism in America. A History*, ed. Gary Land (Grand Rapids, MI: William B. Eerdmans, 1998), 49.

174. George R. Knight, *Angry Saints: Tensions and Possibilities in the Adventist Struggle over Righteousness by Faith* (Hagerstown, MD: Review and Herald, 1989), 64.

175. Knight, *Angry Saints*, 64. Smith made this remark in regard of the new ideas of Alonzo T. Jones on righteousness by faith.

Alonzo T. Jones (1850-1923)

Jones was a second generation Adventist, who temporarily became one of the most influential voices in Adventism during the late nineteenth century.[176] While serving as an Army Sergeant Jones was baptised at Walla Walla in Washington territory in 1873. He soon joined the Adventist missionary endeavours in the area.[177] In 1884, he was transferred to California and because of his writing skills quickly became assistant editor of the *Signs of the Times* journal.[178] He rose rapidly to denominational prominence in 1888 and became with Ellet J. Waggoner best known for his Righteousness by Faith message. After briefly having been appointed to the prominent position of editor of the *Review and Herald*, he left the ministry of the church in the early twentieth century.

During the early1880s, Jones had written a remarkable series of articles on the influence of geology on Adventist thought. Although Jones has been the subject of extensive biographical investigations, not one of those works discusses his brief but significant role in the engagement between geological and Adventist thought.[179] Jones was the first Adventist elder who made an attempt at understanding the nature of geology by the studious reading of a recognised textbook of geology. His negative perception of geology would echo Ellen White's attribution of infidel connotations to geology, and he meticulously searched the textbook for textual references to support that view. Because of his rapid fall from grace at the turn of the century, it was probably not *en vogue* to quote his work, and this may have led to the little-known aspect of his writing on the nature of geology. Chapter 5 deals in detail with the impact of Jones' articles on the denomination's perception of geology.

George McCready Price (1870-1963)

The life of George McCready Price has been the subject of scrupulous research by Ronald Numbers.[180] Numbers has outlined Price's indebtedness to the narrated vision of Ellen White concerning the nature of the days of the Creation and the Flood. It encouraged

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176. George R. Knight, *From 1888 to Apostasy: The Case of A. T. Jones* (Hagerstown, MD: Review and Herald, 1987), 11

177. Doug R. Johnson, *Adventism on the Northwestern Frontier* (Berrien Springs, MI: Oronoko Books, 1996). 15-6.

178. Johnson, *Adventism on the Northwestern Frontier*, 55.

179. Knight, *From 1888 to Apostasy*; George R. Knight, *Angry Saints*; George R. Knight, *A. T. Jones: Point Man on Charismatic Frontier* (Hagerstown, MD: Review and Herald, 2011); Johnson, *Adventism on the Northwestern Frontier.*

180. Numbers, *The Creationists*, 100-2. In addition, Numbers wrote numerous journal articles and book chapters that mention George McCready Price.

Price to discredit modern geology and instead develop a Flood-based type of geology. The impact that Price's work has had on twentieth-century Creationism has frequently been alluded to.[181] However, little has been written on the validity of the geological views expressed in his writings. Chapter 6 of this thesis will analyse his understanding of stratigraphy and the associated principles of conformity of rock formations. It will show how he painstakingly selected material that supported his interpretations only and chose to ignore the total picture. His style of writing was so persuasive that those not educated in university-level geology would not realise his severe contextomy[182] that led to erroneous conclusions.

2.5 Conclusion

Many influential events and processes of change coincided during the nineteenth century to bring about the engagement between geological and Adventist thought. Political, social, philosophical and theological changes took place and conspired to create this thought engagement. Geology established itself as a new science with a new philosophy that favoured speculation and hypotheses to guide data collection and knowledge generation. Adventism established itself as a new denomination that focused on the end-time events as prophesied in the Old and New Testaments of the Bible. The Adventists were guided in this endeavour by a naïve Baconian Common Sense realism philosophy. This set the scene for a thought engagement that would have long-lasting after-effects.

181. Besides the references by Ronald Numbers as cited in this thesis, Edward J. Larson's references to George McCready Price's impact noted in *Trial and Error: The American Controversy over Creation and Evolution* (Oxford: Oxford University Press, 2003), 65 are also relevant here.

182. Contextomy refers to the selective selection of words from their original context and through that distorts the source's intended meaning.

Chapter 3

Ellen White's Warning of 'Disguised Infidelity of the Worst Kind' to the 'Little Flock'

> Just how God accomplished the work of Creation in six literal days, He has never revealed to mortals.
>
> —Ellen G. White, *Spiritual Gifts*, vol. III

> It has been impossible to make some see that the present truth is *present* truth, and not future truth. And that the Word as a lamp shines brightly where we stand, and not so plainly on the path in the distance.
>
> —James White, "A Sketch of the Rise and Progress of the Present Truth"

> There will be a development of the understanding, for the truth is capable of constant expansion . . . Our exploration of truth is yet incomplete.
>
> —Ellen G. White, Letter from Ellen White to P. T. Magan

> Instead of confining their study to that which men have said or written, let students be directed to the sources of truth, to the vast fields opened for research in nature and revelation.
>
> —Ellen G. White, *Education*

3.1 Introduction

The use of the term 'infidelity' to describe Christianity's understanding of geology and its practitioners during the nineteenth century was quite *en vogue* among orthodox churchmen. It was therefore not extraordinary for Ellen White to state in 1864 that "Infidel geologists claim that the world is much older than the Bible record makes it."[1] The modern geologists, she continued, "reject the Bible record, because of those things which are to them evidences from the earth itself."[2] Stressing the importance of the seventh-day Sabbath and obeying the Ten Commandments, she lamented that, "the infidel supposition, that the events of the first week required seven vast, indefinite periods for their accomplishment (an interpretation generally used by harmonising geologists) strikes directly at the foundation of the Sabbath of the fourth commandment."[3] She considered this an example of "the worst kind

1. Ellen G. White, *Spiritual Gifts*, vol. 3 (Battle Creek, MI: Seventh-day Adventist, 1864), 91.

2. Ibid.

3. Ibid.

of infidelity."[4] Ellen White perceived the long ages interpretation of Genesis I as a threat to the theology of the emerging Seventh-day Adventist denomination that emphasised the 24-hour duration of all days of the Creation week. In the late 1840s, she had already warned the small group of believers, the 'little flock,' of the importance of obeying specifically the fourth commandment for reaching the Holy City.[5]

While now not so widely read, even by conservative Adventists, these very negative statements about geological thought fall on modern ears as being somewhat harsh and poorly informed. Twenty-first century geologists would judge Ellen White's 1864 'infidel geologist' statements to be indiscriminate, undeserved, and irrelevant, since most professional geologists experience their discipline as a functional science that, while methodologically naturalistic, is not at all anti-religious in its intention.

In fact, this was already largely so by the mid-nineteenth century. Geology had expanded and specialised so much on its journey towards becoming a mature science that its professionals found it impossible to pursue it within the perceived strait-jacket of the very brief Mosaic narratives. On both sides of the Atlantic, many sincere Christian academics made the adjustment to the longer time scales implied by what they perceived to be unanswerable data, and without a sense of having compromised their strong theistic belief and practice. Rudwick terms the state of separation of geology from the traditional biblical narratives and time scales around the mid-nineteenth century as the "amicable disassociation."[6] However, many evangelicals continued to see geological theories as an attempt by the naturalist professionals to dictate new interpretations of the Genesis narratives that infringed on their doctrines. This chapter will look at the nineteenth century use of the 'infidel' term; Ellen White's religious background; the Seventh-day Adventist theological context for the controversy with geological thought; an analysis of sources that may have influenced Ellen White; and a consideration of the establishment of her charismatic authority within Adventism.

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4. Ibid.

5. Ellen G. White, Dear Brother Bates," *A Word to the Little Flock* (New Brunswick, May 1847), 18-20.

6. Martin J. S. Rudwick, "Biblical Flood and Geological Deluge: The Amicable Disassociation of geology and Genesis," in *Geology and Religion: A History of Harmony and Hostility*, ed. M. Kölbl-Ebert (London: Geological Society, 2009), 103-10.

3.2 The 'Infidel' Term

During the nineteenth century, evangelical preachers frequently used the infidel term to contrast the behaviour of the unbeliever with the true follower of Christ. The perception of being an infidel went beyond just being an unbeliever. Samuel Johnson's authoritative English dictionary provides a mid-century portrayal of an infidel as an unbeliever, miscreant (a villain; a vile wretch or rogue; one that holds a false faith; one who believes in false gods), pagan and one who rejects Christianity. Infidelity was articulated as want of faith, disbelief of Christianity, and deceit.[7] In 1867, the Primitive Methodist Magazine carried an article wherein it was suggested that an infidel was not just a person without faith but more specifically an unbeliever in the strict Gospel sense of the word: not believing in Christ. For example, although Jews honoured God they did not believe in Christ as a messiah, thus were unbelievers.[8]

The use of the condemning label 'infidel' became a tool for evangelicals to push harder for the authority of Scripture and to acquire more converts.[9] Marty confirms that 'infidel' was indeed a very commonly used term during the nineteenth century. Over the years the term would include the 'freethinker,' 'agnostic,' 'atheist,' 'secularist' and other types of unbelievers.[10] It was popularly conceived that the typical infidel in America challenged the growth of evangelical denominations after the separation of church and state. Marty suggests that such an infidel thrived on the reaction of the *religious* majority.[11]

Marty was convinced that the image of the infidel definitely helped to shape the nation's religious life in nineteenth century America.[12] Marty, therefore, suggests that the New England evangelical churches "found infidelity a convenient symbol for the furtherance of their claims."[13] The image of the infidel could be used to advance the church's own

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7. Samuel Johnson, *A Dictionary of the English Language, Newly Revised and Corrected*, vol. 1 (Heidelberg: Joseph Engelmann, 1828), 584.

8. Joseph Wood, "God's Law on Marriage: An Essay," *Primitive Methodist Magazine*, vol. V, New Series (February 1867): 72.

9. John van Wyhe, *Phrenology and the Origins of Victorian Scientific Naturalism* (Aldershot: Ashgate, 2004), 155, 164.

10. Martin E. Marty, "The Infidel and the Indifferent," The Martin Marty Center for the Advanced Study of Religion, University of Chicago. http://divinity.uchicago.edu/sightings/infidel-and indifferent-martin-e-marty. (accessed March 14, 2014).

11. Ibid.

12. Martin E. Marty, *The Infidel: Freethought and American Religion* (Cleveland, OH: The World, 1961), 11.

13. Ibid., 105.

purposes; it was a powerful mental picture or metaphor that spoke vividly to the imagination of congregations. The orthodox churches "conjured up the image of the infidel as a *contrast* to their position."[14] For the Presbyterian leader Thomas DeWitt Talmage, who was considered by many to be among the leading defenders of orthodoxy, infidelity "substituted nothing but untruth, blasphemy, unfairness, outrage, and meanness for the comforts it removed" and was "the friend of all that is impure."[15]

Marty, therefore, suggests that the use of the infidel metaphor had risen especially to prominence at those moments in American history when the churches were struggling with social or theological questions.[16] An appreciation of the context of the use of the infidel metaphor during the nineteenth century helps to understand why Ellen White used it. The infidel connotation of the naturalist science of geology made it easier for the Adventist congregation to grasp the undesired nature of it. Ellen White strongly felt that contemporary geology challenged the very foundation of Adventism's theology and that the congregation needed to be warned of this. Nowadays conservative Adventists talk about 'conventional' geology instead of using the now outdated infidel metaphor.

3.3 Ellen White's Religious Background

The Harmon family had been Puritans for generations, but it was Ellen White's father, Robert Harmon, who introduced the family to the Methodist Episcopal Church. As a consequence, the young Ellen Harmon would inherit strict Puritan standards combined with Wesleyan Methodist teachings. Methodism had been the fastest growing denomination in the United States of America (USA) during the early nineteenth century, and a Methodist background was therefore not uncommon; in fact, 44% of the Millerite lecturers were also Methodist.[17] Definite Methodist influences have been traced by Adventist historians in the writings of White and Adventism at large.[18] Woodrow Whidden was convinced that through Ellen White the "Wesleyan tradition has been the most essential influence on Adventism."[19] However, it is interesting to note that despite the strong early Methodist influences in Ellen

14. Ibid., 15.

15. Ibid., 160.

16. Ibid., 13.

17. Gary Land, *Adventism in America: A History* (Grand Rapids, MI: William B. Eerdmans, 1986), 34.

18. Gregory A. Schneider, "The Methodist Connection to Adventism," *Spectrum* 25, no. 5 (September 1996): 26.

19. Woodrow Whidden, "Ellen White and John Wesley," *Spectrum* 25, no. 5 (September 1996): 48.

White's Christian Life, Adventism and Methodism would take predominantly different routes when it came to science and particularly when it came to geological theories.

Farrelly observes that in comparison with their Congregational, Presbyterian and Episcopalian contemporaries early Methodists were not well educated and that the nineteenth century Methodists had a reputation for being somewhat anti-intellectual.[20] However, she shows that this situation changed and that during the 1830-1860 period Methodist ministers founded more than thirty colleges and universities and that there were strong currents within Methodism moving it away from anti-intellectualism.[21] Farrelly indicates, for example, that there were Methodist ministers such as Henry Martyn Bannister who understood that "the discoveries of geologists would one day be accepted by all Christians."[22] Bannister felt that the "conflict of geology is really not with Moses, but with a favourite, a cherished interpretation of Moses."[23]

Another enormous influence on Sabbatarian Adventists was, of course, William Miller, to whose teaching the young Ellen Harmon was first exposed in 1840.[24] Early Seventh-day Adventists continued to apply Miller's common sense approach and 'Rules of Interpretation' to Scripture as they expanded this end-time theology to embrace new elements such as the seventh-day Sabbath, as they perceived it to be incorporated within the three angels' message of Revelation 14.[25] In 1884, Ellen White could still state, "Those who are engaged in proclaiming the third angel's message are searching the Scriptures upon the same plan that Father Miller adopted."[26] They continued to emphasise Miller's doctrine of *Sola Scriptura* as their sole source. Ellen White, as the seminal figure in the growing Church, endorsed many of Miller's views and this endorsement validated their authority for members

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20. Maura Jane Farrelly, " 'God is the Author of Both': Science, Religion and Intellectualization of American Methodism," *Church History* 77, no. 3 (September 2008): 661.

21. Ibid., 662.

22. Ibid., 677.

23. Henry M. Bannister, "Science and Revelation," *Methodist Quarterly Review* 36 (1854): 223.

24. Jeff Crocombe, " 'A Feast of Reason:' The Roots of William Miller's Biblical Interpretation and its Influence on the Seventh-day Adventist Church" (PhD diss., University of Queensland, 2011), 173. Millerism was an early nineteenth century religious movement which believed that the Second Advent of Christ would occur around 1843, 44. The movement was led by Baptist lay preacher, William Miller (1782-1849). Seventh-day Adventism was an offshoot of Millerism and substantially followed Miller's Bible study methodology; interest in prophecy; and focus on the Second Coming.

25. Ibid, 175.

26. Ellen G. White, "Notes of Travel," *Review and Herald* 61, no. 47 (November 25, 1884): 738.

of the Seventh-day Adventist Church.[27] For example, in many instances, she demonstrated her dependence on Miller's Rules (for Bible study).[28] Clearly, these rules lay at the heart of White's understanding of genuine faith building and of her method for dealing with theological challenges. Further, her use of Miller's literal historicist interpretation of God's word strongly informed her views of the creation days and those of the flood.

3.4 Early Seventh-day Adventist Context as a Factor for the Engagement with Geological Thought

3.4.1 The Sabbath

Perhaps the major reason for Ellen White's stance against what she perceived as the geological wisdom of her time was the seventh-day Sabbath. Joseph Bates had earlier come to see that adherence to the fourth commandment, namely, the seventh-day Sabbath was a necessity for complete salvation, and this had been accepted by Ellen White.[29] Knight observes that "it is impossible to overemphasise the importance of Bates' contribution to the development of Sabbatarian Adventist theology."[30] According to Bates, all advent believers who "despise and reject this covenant (Sabbath) will just as certainly be burned and destroyed with the ungodly wicked at the desolation of the earth, as Isaiah has prophesied."[31]

The perceived undermining of a literal, seven-day creation by the geologists was, therefore, seen as being diametrically against this central doctrine of the nascent denomination.[32] Ellen White had earlier, through the printed narratives of one of her early visions, warned the 'little flock' of obeying specifically the fourth commandment for reaching the Holy City. Indeed, she would see in her 5 January 1849 vision that saints who did not keep the Sabbath at the Holy City were wearing garments on which it was written in

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27. Crocombe, " 'A Feast of Reason,' "188.

28. Ibid., 188, 193.

29. Joseph Bates, *The Seventh Day Sabbath, a perpetual Sign, from the Beginning to the Entering into the Gates of the Holy City, According to the Commandments* (New-Bedford: Press of Benjamin Lindsey, 1846), 2; George R. Knight, *Joseph Bates: The Real Founder of Seventh-day Adventism* (Hagerstown, MD: Review and Herald, 2004), 82, 96.

30. George R. Knight, *A Search for Identity: The Development of Seventh-day Adventist Beliefs* (Hagerstown, MD: Review and Herald, 2000), 71.

31. Joseph Bates, *A Seal of the Living God: A Hundred Forty-four Thousand of the Servants of God Being Sealed* (New-Bedford, MA: Press of Benjamin Lindsay, 1849), 62-3. Bates referred specifically to Isaiah 24: 5-6.

32. Ellen White, *Spiritual Gifts*, vol. 3, 91.

large characters, "Thou art weighed in the balance, and found wanting."[33] Such messages left no doubt amongst the early Adventist believers over the extreme importance of honouring the seventh-day, Holy Sabbath. Even after the passage of time had dulled the sense of imminent judgement, as it certainly did, the fear of modern geological theories has largely survived in the Seventh-day Adventist Church into the twenty-first century because they continue to be perceived as directly challenging the Sabbath.

3.4.2 The Second Coming

Evidence suggests that she was also greatly concerned that modern geology would undermine the church's other central doctrine, that of the Second Advent of Christ. The doctrine of the second coming influenced Ellen White's attitudes to geology in a number of ways. The first is closely connected to the point above. It is easy to understand that for the Adventist pioneers any supposed benefits accruing from an acceptance of old-age Earth theories were deemed totally insignificant compared to the need to be ready for the soon Second Advent. Furthermore, if geology suggested long ages in the past – the implication would be that there could be long ages in the future. This challenged the perceived imminence of the Second Coming. Thus, the remnant little flock *had* to be warned about the undermining influences of modern geologists. It should not be forgotten that Ellen Harmon herself had, in her early teenage years, experienced intense fear of burning in hell because of not being able to enter Heaven.[34] The second relates to the materials that would be used to fuel the violent destruction of this Earth to which the Second Coming would give rise. It seems from her work that a diminishing of the Noachian deluge was perceived as undermining the supply of the raw materials, mainly coal and oil resulting from it, which were to play a role in the final conflagration by providing fuel for its heralding earthquakes and volcanic eruptions.[35]

There was a third, perhaps subtler, way in which the early Adventist understanding of the Second Coming would affect attitudes to science. Because of the Sabbatarian Adventist's belief in the imminence of this event, education was lightly valued and they certainly saw no need to establish their own schools during the 1850s and 1860s. Further, Church members

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33. See the narrative of her vision at Bro. Howland's home, early April 1847. Ellen White, "Dear Brother Bates," 18-20; Also see the narrative of her vision at Bro. Belden's home on January 5, 1849. Ellen G. White, "The Sealing," in *Early Writings*, 2002 edition of 1882 version (Coldwater, MI: Remnant, 2002), 34-5.

34. George R. Knight, *Meeting Ellen White: A Fresh Look at her Life, Writing and Major Themes* (Hagerstown, MD: Review and Herald, 1996), 14.

35. Ellen White, *Spiritual Gifts*, vol. 3, 87.

had been almost exclusively drawn from uneducated circles. It is no surprise, then, that during the early decades of its existence the rapidly expanding Church lacked academically trained persons capable of understanding the intricacies of the already complex epistemology of modern geology. This attitude would begin to change as the denomination grew and additional workers were needed to be trained to spread the Adventist message. Ellen White received her first education vision in January 1872.[36] But even when Battle Creek College opened in 1874 it was believed that short courses were sufficient for training church employees. With a still persistent belief in the imminent Second Advent, it was felt that degree programs were too time-consuming and laden with academic baggage. Thus, they were deemed unnecessary for putting trained workers in the field.[37] Only towards the end of the century, when Adventism had become a world movement, would this attitude change.

3.4.3 The Great Controversy Theme

Her views on origins were also seen as an important part of the 'Great Controversy' meta-narrative, beginning before this Earth's creation and continuing until the final grand consummation of all evil.[38] The perceived centrality of Ellen White's views on origins for this construct has been a major factor in its resilience within Seventh-day Adventism.

3.5 Possible Sources Informing Ellen White's References to Geological Thought

From the publication of her first books, much has been written about the recognition of textual fragments and concepts from other authors in Ellen White's writing. Although she always denied any literary borrowing, it is now well recognised that she was in many aspects a collaborative author who borrowed extensively from others.[39] It is not the aim of this research to defend or deprecate this practice but merely to explore possible sources of Ellen White's ideas.

Source analysis in this instance is not an easy task as Ellen White had access to numerous sermons, devotional books, Bible Society tracts, Bible commentaries and general

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36. Doug R. Johnson, *Adventism on the Northwestern Frontier* (Berrien Springs, MI: Oronoko Books, 1996), 99.

37. Floyd Greenleaf, "Has the Leopard changed its Spots?: A Commentary on Purpose, Principle, and Change in Adventist Education. Part 1," *Journal of Adventist Education* 68, no. 5 (Summer 2006): 12.

38. Ellen White presented the history of this world as a part of a much larger drama, that of a cosmic battle between Satan and the forces of evil against the God of heaven. She called this the 'great controversy', which descriptor became the title of one of her best known books.

39. See Arthur N. Patrick, "Author," in *Ellen Harmon White: American Prophet*, ed. Terrie Dopp Aamodt, Gary Land, and Ronald L. Numbers (Oxford: Oxford University Press, 2014), 91; Fred Veltman, "The *Desire of Ages* Project: The Data," *Ministry* 63, no. 10 (October 1990): 4.

Christian literature.[40] She was also able to read a full range of magazines that came to the *Review and Herald* office from other publishers. Also, she had about 1,400 volumes available in her personal and office libraries.[41] Secondarily, an attempt has also been made to recognise the datedness of any time-conditioned geological components, since this may have implications for their continued authoritative use in Adventism. Veltman observed in a personal postscript to his research that Ellen White's writings contain both time-conditioned and timeless statements and that there is a need to investigate further and differentiate between these.[42] This research has also endeavoured to identify elements in her text that linked geology with an emerging response to the concept of organic evolution.

Rather than simply presenting a list of authors in chronological order, an attempt has been made to divide these into two oppositional groups. The first three authors were chosen because of their major roles in the secularising of science over the period leading up to and during that in which Ellen White wrote. In effect, they represent the case to which she made such strenuous objection. The second group from Athanasius Kircher onwards wrote works with which Ellen White could have resonated and which may have influenced both her thought development and word usage.

However, before examining the works of individual authors of possible significance, it is important to note that Ellen White's writings on geology may reflect some common understandings of her day resulting from much-publicised discoveries. An example of this is provided by her mention of "much larger men and beasts' which "once lived upon the earth" and "large, powerful animals", that "existed before the flood that do not now exist."[43] These claims must be seen in the context of eighteenth and nineteenth century discoveries in the United States. In 1705, a fist-size giant tooth and later also gigantic jawbones and other bones had been found along the Hudson River banks.[44] American Protestants immediately connected these with Genesis 6:4, "There were giants in the earth those days." The giant tooth was initially thought to belong to a human pre-Flood giant. The fossil bones were seen as archaeological evidence of Mosaic history supporting the veracity of the Flood and, with

40. Veltman, "The *Desire of Ages* Project: The Data," 5.

41. Patrick, "Author," 96.

42. Fred Veltman, "The *Desire of Ages* Project: The Conclusions," *Ministry* 62, no. 12 (December 1990): 15.

43. Ellen White, *Spiritual Gifts*, vol. 3, 92.

44. Paul Semonin, *American Monster: How the Nation's First Prehistoric Creature became a Symbol of National Identity* (New York: New York University Press, 2000), 2-3, 11, 16-7.

that, the inevitability of the millenarian Conflagration. By the early nineteenth century it had become obvious that the bones were those of the Mastodon, a relative of the Mammoth. However, the mistaken belief that they were the remains of giant humans lingered much longer among the general public.

3.5.1 Contemporary Authors Promoting Secular Theories

George Combe and Robert Chambers: An Emphasis on 'Laws of Nature'

Two works that may well have influenced Ellen White prior to her publication in 1864 of volume 3 of *Spiritual Gifts* would have been Combe's *The Constitution of Man* and Chambers' *Vestiges of the Natural History of Creation*. George Combe (1788-1858) and Robert Chambers (1802-1871) were both phrenologists, and they believed in the importance of natural laws in the operation of the world.[45] Combe was a founding member of the Edinburgh Phrenological Society and the most prolific British phrenologist of his time. Chambers became an enthusiastic phrenologist in the 1830s, and his *Vestiges* did much to advance phrenological naturalist thought. Their books promoted the view that natural laws, rather than God, controlled the world and in a sense, they marked a transition to a new naturalistic era. Within that context, Darwin's *Origin* would subsequently look at the specific role that natural selection played within the origin of species.

Combe's *The Constitution of Man* was first published in 1828. In general, his book examines the operation of natural laws on man and society. Combe regarded natural laws as regularities of matter and mind which the Creator had instituted at the beginning. These natural laws included physical laws, organic laws (including the laws of hereditary descent) and also laws of the moral and intellectual realms. He did not speak for current science and serious scientists of the day largely ignored his book. Conservative Christians also rejected the book, since they saw in it an attempt to replace God with natural laws, promoting a non-Christian alternative narrative of the world.[46] However, by the 1860s, *Constitution*'s sales had already reached 200,000 in America; more than double the combined sales figures of *Vestiges*

45. During the early nineteenth century phrenology was a popular pseudoscience that was based on measurements and observations of the shape of the human skull from which apparently a large range of personal propensities could be deduced. George Combe was a well-known practitioner who brought phrenology to the attention of the British middle classes. He would eventually diverge towards discussing the relationship between science and religion and would be labelled an atheist and materialist. Phrenologists emphasised the work of natural laws above God's creation by fiat or His continuing control over nature.

46. Van Wyhe, *Phrenology*, 140.

and *Origin of Species* during that period. The book remained continuously in print until 1899. Although often overlooked, its impact and influence were enormous.[47]

Shortly after, while the Millerite Adventists were experiencing their Great Disappointment in 1844, the appearance of the anonymous *Vestiges* created another Victorian print sensation in Britain and America. The *Vestiges* was, in essence, a controversial synthesis of the natural sciences with some theology moulded into a general theory of creation.[48] The anonymity of its author did much to heighten the attraction of this (r)evolutionary book. The fact that it was written in a popularist style made it easy for the general public to digest. Although ideas about transmutation had been circulating for some time in academic circles, this was the first occasion that evolutionary ideas were brought to the public arena. It was the start of a secular public culture that would continue to grow during the second half of the nineteenth century.[49] Although recognising God as the initial Creator, it promoted natural laws, rather than God's on-going acts, as guiding progress from the earliest nebulae all the way to the final destiny of the human race. Interestingly, the book nowhere used the term 'evolution'. However, for those that seriously perused the text, the evolutionary hypothesis was undoubtedly there.

> The idea, then, which I form of the progress of organic life upon the globe – and the hypothesis is applicable to all similar theatres of vital being – is, *that the simplest and most primitive type, under a law to which that of like-production is subordinate, gave birth to the type next above it, that is again produced to the next higher, and so on to the very highest*, the stages of advance being in all cases very small – namely, from one species only to another; so that the phenomenon has always been of a simple and modest character.[50]

It was Chambers' early phrenological influences that had propelled him to develop the progressive naturalist narrative of the *Vestiges*.[51] Not surprisingly, the Edinburgh phrenologists praised the book for promoting the evolution of animals and plants and its advocacy of law.[52] The Evangelicals in Scotland, on the other hand, were highly critical of

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47. Ibid., 127-8.

48. James A. Secord, *Victorian Sensation: The Extraordinary Publication, Reception, and Secret Authorship of Vestiges of the Natural History of Creation* (Chicago: University of Chicago Press, 2000): 1.

49. Ibid., 5.

50. Robert Chambers, *Vestiges of the Natural History of Creation* (London: John Churchill, 1844), 223. Italics by Chambers.

51. Secord, *Victorian Sensation*, 85.

52. Ibid., 265.

the book and characterised it as "atheism under a Christian banner."[53] The Scottish Free Church also actively opposed *Vestiges*, which they perceived as based on false science.[54] The Religious Tract Society joined this opposition through its series of evangelical monthly volumes. From 1845, it sold about 30,000 copies of each of the two parts of Thomas Dick's *Solar System* in the next five years.[55] (Dick's contribution is discussed later in this chapter.) The Society felt that the skeptical arguments of Vestiges especially endangered young Christian men.

In America, *Vestiges* created a similar sensation and, in the absence of international copyright, it was reprinted freely there by at least four different publishers. As it went through about twenty editions, more copies were sold in the United States than in Great Britain. Interestingly, and although it might easily have been otherwise, *Vestiges* does not appear to have attracted explicit comment in the Adventist *Review and Herald* within its first decades. It was not mentioned by name until 1940 when an associate editor, Spicer, concluded with the benefit of hindsight that the rising of the Advent message in 1844 had actually occurred to meet the challenge of the publication of Chambers' ideas of man's origins.[56] However, from their earliest years both the *Review and Herald* and *The Signs of the Times* frequently discussed the undesirable influence of "men of science" and their "laws of nature."[57] For example, the *Review and Herald* discussed 'laws of nature' in its articles more than twice every year; with a definite increase after 1859 and another spike from the 1880s onward. Darwin's publication of *Origin* may have triggered the first increase while the second spike was probably a reaction to the increasing acceptance of a theistic form of evolution by bigger denominations with a more liberal approach. It is clear that early Sabbatarians were very much aware of, and threatened by, the new naturalist ideas.

Ellen White's chapter on "Disguised Infidelity", in *Spiritual Gifts* discusses this matter implicitly. The publication of her panoramic vision of the creation days can be seen as an assuring, authoritative statement to confirm the literal Mosaic narrative in the light of

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53. Ibid., 274.

54. Ibid., 277.

55. Ibid., 323.

56. T. Joe Willey, "Vestiges of the Natural History of Creation." *Spectrum Magazine Blog*, August 30, 2012, http://Spectrummagazine.org/node/4715 (accessed January 10, 2014).

57. Between 1850 and 1900 the *Review and Herald* "laws of nature" appeared 138 times; between 1855-59, 9 times; between 1860-69, 26 times; between 1870-79, 24 times; between 1880-89, 43 times and between 1890-99, 37 times. Between 1874 and 1900 *The Signs of the Times* used the phrase 51 times.

threatening naturalistic, evolutionary ideas. Her brief references to men who "are upon a boundless ocean of uncertainty" and who "seek to account for God's creative works upon natural principles," clearly state her opposition to the secular progressive theories of her days.[58] Such references strongly suggest that contemporary theories of secular scientists influenced her work.

In 1904, when the church was dealing with a crisis surrounding J. H. Kellogg's alleged pantheism, Ellen White clearly articulated her aversion to the view that nature's laws could operate without God. She considered that to be false science.

> In dwelling upon the laws of matter and the laws of nature, many lose sight of, if they do not deny, the continual and direct agency of God. They convey the idea that nature acts independently of God, having in and of itself its own limits and its own powers wherewith to work. In their minds there is a marked distinction between the natural and the supernatural. The natural is ascribed to ordinary causes, unconnected with the power of God. Vital power is attributed to matter, and nature is made of deity. It is supposed that matter is placed in certain relations and left to act from fixed laws with which God Himself cannot interfere; that nature is endowed with certain properties and placed subject to itself to obey these laws and perform the work originally commanded. This is false science; there is nothing in the word of God to sustain it. God does not annul His laws, but He is continually working through them, using them as his instruments. They are not self-working. God is perpetually at work in nature. She is His servant, directed as He pleases. Nature in her work testifies of the intelligent presence and active agency of a being who moves in all His works according to His will.[59]

Charles Darwin: Natural law (Natural Selection) and a Geological Old Earth

On the Origin of Species was published in 1859 just before the official establishment of the Seventh-day Adventist Church. Darwin's arguments on natural selection relied heavily on Charles Lyell's old-Earth geological views.[60] As we have seen, Ellen White first wrote on geology in 1864 with her chapter, "Disguised Infidelity" in volume three of *Spiritual Gifts* in which she strongly advocated a six thousand-year-old Earth with a six-day creation week. Hare takes the view that the timing of Ellen White's publication just a few years after

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58. Ellen White, *Spiritual Gifts*, vol. 3, 93.

59. Ellen G. White, *Testimonies for the Church*, vol. 8 (Mountain View, CA: Pacific Press, 1904), 259-60.

60. See chapter X of Charles Darwin, *On the Origin of Species by Means of Natural Selection, Or the Preservation of Favoured Races in the Struggle for Live* (London: John Murray, 1859), 245-73.

Darwin's book on evolution does not seem to be a coincidence and that it was meant to counter his evolutionary ideas.[61]

Building on the view of natural law advocated in books like *Vestiges*, Darwin promoted the mechanism of 'natural selection' as the driving force behind the diversification of life. The *Review and Herald* had on January 29, 1861, reprinted an article from *American Baptist* where Darwin's term 'natural selection' was given as an example of 'laws of nature.'[62] Ellen White would most likely have read this front page article and her mention of men who "endeavour to explain from natural causes the work of creation," could be understood to directly refer to Darwin and his theory.[63] It should be remembered that Darwin was initially better known for his theories of 'descent with modification' and 'natural selection' than for 'evolution'. He did not make use of the latter term in *On the Origin of Species* until its sixth edition in 1872.

3.5.2 Authors whose Geological Thoughts and Phrases resonated with Ellen White

Athanasius Kircher (1602-1680): Inundations of Waters and a Deluge of Fires

Kircher provided in his *Mundus Subterraneus* perhaps the best-known pictures and descriptions of the concept of the existence of underground cavities (see fig. 3.1).[64] Kircher's seventeenth century accounts closely resembled the tenor of Ellen White's message of the past Flood and the imminent end-time fiery conflagration. Kircher states that "earthquakes are the proper effects of subterrestrial combustions." He predicts an event,

> which shall at length come to pass, in that fullness of time, when all the reins of unruly nature shall be broke loose, and the cataracts, or floodgates as it were, of subterraneous fire flung open by the command of the Divine Power . . . to the ruin and destruction of the whole world.[65]

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61. P. Edgar Hare, "SDA Attitudes toward the Geological Sciences, Then and Now." (Unpublished document, April 1986), 6.

62. [American Baptist?], "Are Miracles Precluded by the Laws of Nature?, *Review and Herald* 17, no. 11 (January 29, 1861): 81. Article reprinted from Baptist Missionary Magazine (*American Baptist*).

63. Ellen White, *Spiritual Gifts*, vol. 3, 94.

64. Athanasius Kircher, *Mundus Subterraneus* (Amsterdam: Janssonium & Elizeum Weyerstraten, 1664).

65. Athanasius Kircher, *The Vulcano's: Or, Burning and Fire-Vomiting Mountains Famous in the World: With Their Remarkables. Collected for the Most Part out of Kircher's Subterraneous World; And Expos'd to More General Views in English, upon the Relation of the Late Wonderful and Prodigious Eruptions of Ætna* (London: John Allen, 1669), 5.



Figure 3.1 Kircher's imagined subterraneous cavities filled with fire and water in *Mundus Subterraneus* (1664).

Source: http://kircher.stanford.edu/gallery

Kircher, like Ellen White, had made a comparison between the effect of the Flood and the final conflagration. He states,

> Even as in the universal Flood, the windows of heaven, and gulfs of the abysses being opened, he destroyed the world by an inundation of waters, even so also, in the last times, he might destroy the same by a Deluge of fires.[66]

Ellen White writes in a similar vein,

> As he called forth the waters in the earth at the time of the flood, as weapons from his arsenal to accomplish the destruction of the antediluvian race, so at the end of the one thousand years he will call forth the fires in the earth as his weapons which he has reserved for the final destruction.[67]

66. Ibid., 4.

67. Ellen White, *Spiritual Gift*, vol. 3, 87.

Kircher also saw in "the manifest provision and preparation of so much combustible matter," without specifying where it came from, an "evident token of preparation to the total and final conflagration prescribed by the Divine wisdom."[68] Ellen White paints a similar picture: "Waters in the bowels of the earth gushed forth, and united with the waters from Heaven, to accomplish the work of destruction."[69] Concerning the end-time events she states, "in the day of the Lord, just before the coming of Christ, God will send lightnings (sic) from Heaven in his wrath, which will unite with fire in the earth."[70] It is obvious that seventeenth century concepts can be identified in Ellen White's metanarrative. How they found their way into her writings is uncertain, but it may have involved the writings of John Milton, John Wesley, or multiple secondary sources.[71]

John Milton (1608-1674): An Eyewitness Account of the Flood

John Milton's famous epic poem, *Paradise Lost*, has enjoyed immense popularity for several centuries since its first publication in 1667. Its popularity during the eighteenth and nineteenth centuries can hardly be overestimated. Bernard Sharratt stresses the extent to which Milton's poem became appropriated over time; it was frequently memorised by public schoolboys and was commonly selected as suitable Sunday reading by Christian households.[72] Its attraction lay largely in the vivid, eyewitness-like narration of the biblical story of the Fall of Man. Matthew Stallard states that, "at times, Milton makes *Paradise Lost* sound so much like the Bible that one is convinced he/she is hearing the words of the Bible."[73] It is interesting to note that in the beginning of *Paradise Lost*, Milton claims that he has been divinely inspired by the "Heav'nly Muse" or Holy Spirit with knowledge of things unknowable to fallen humans. He considers himself to be the passive instrument "through whom flows the emanation from on high; his words are not entirely his own, but a suggestion."[74] Most people in the nineteenth century would, indeed, have had difficulty in

68. Kircher, *The Vulcano's: Or, Burning and Fire-vomiting Mountains*, 4.

69. Ellen White, *Spiritual Gifts*, vol. 3, 82

70. Ibid.

71. *Mundus Subterraneus* was first published in 1664 and *Paradise lost* was first published in 1667.

72. Bernard Sharratt, "The Appropriation of Milton," in *Essays and Studies*, vol. 35, ed. Suheil Bushrui (London: John Murray, 1982), 36.

73. Matthew Stallard, *Paradise Lost: The Biblically Annotated Edition* (Macon, GA: Mercer University Press, 2011), xxiii.

74. Ibid., 188. Ellen white claimed that she was equally divinely inspired during her visions.

differentiating between their recollections from Moses and those from Milton, his principal paraphrast.[75]

However, while *Paradise Lost* does contain many allusions to the Bible accounts, it also contains events that do not line up with it. Detail is added and characters given extended personalities so that the reader might better understand them. The similarity between text elements in *Paradise Lost* and Ellen White's writing have been discussed by several researchers. Patrick, for example, lists many observed textual similarities.[76] The choice of specific terms in Ellen White's writing, such as 'cataracts of heaven' and 'verdure,' have a Miltonesque ring but were equally used in other secondary sources and, therefore, cannot be used as indicators of material borrowed from Milton.

The most obvious similarities between *Paradise Lost* (PL) and *Spiritual Gifts* (SG) in phrases used include: 'their wicked ways' (PL)/ 'their abominations' (SG); 'God's wrath to come' (PL)/ 'in his wrath' (SG); 'Cataracts of Heaven set open' (PL)/ 'water seemed to come from heaven like mighty cataracts' (SG); 'fountains of the deep broke up' (PL)/ 'fountains of the deep were also broken up' (SG); 'verdure' (PL)/ 'verdure' (SG); 'driven by a keen north wind, that, blowing dry' (PL)/ 'a powerful wind to pass over the earth for the purpose of drying up the waters' (SG); 'rapid currents' (PL)/ 'waters moved with great force' (SG); 'trees adrift' (PL)/ 'hills and mountains were formed of stones, trees, and earth' [washed together] (SG); 'boundless lake of water' (PL)/ 'wide watery glass . . . standing lake' (SG). Besides the obvious similarity in phrases, it is principally the vivid nature of the descriptions giving a near-eyewitness account of the events in Milton's poem that align most strongly with Ellen White's use of 'I saw' and 'I was shown' statements.

Many concepts in John Milton's and Ellen White's narratives are clearly time-conditioned. The late-seventeenth century speculative concept of massive underground cavities where large quantities of water are stored and from which fountains of water could break forth, as described by savants such as Athanasius Kircher (1602-1680) and Thomas

75. Mark Pattison, *Milton* (London: MacMillan, 1923), 189.

76. Arthur N. Patrick, "Post 98. Ellen White's inspiration, in view of her use of the writings of John Milton." *The Adventist Studies Blog*, posted February 26, 2013, http://adventiststudies.com/2013/02/2 (accessed April 30, 2014).

Burnet (1635-1715), was clearly no longer entertained by the mid-nineteenth century professional geologists of Ellen White's time.[77]

John Wesley (1703-1791): Burning Mountains and Cities Swallowed Up

Warren Johns discusses the possibility that Ellen White borrowed some of her terminology and concepts from John Wesley (1703-1791).[78] Johns notes that Ellen White's early training was in Methodism and that she was familiar with, for example, John Wesley's *Works* as she once quoted extensively from volume 3 of this in *The Great Controversy*.[79] As Johns notes, some parallels suggest Ellen White's familiarity with Wesley's writing on earthquakes, not only in her books but also through her articles in the Adventist periodicals.[80]

There are, indeed, several significant parallel elements and concepts which Wesley's 'earthquake' sermon (W) has in common with Ellen White's panoramic description of the cause of earthquakes and the occurrence of burning mountains after the Flood in volume 3 of *Spiritual Gifts* (SG). The following parallels serve as examples: 'hollow rumbling sound' (W)/ 'muffled thunder' (SG); 'the ground heaved and swelled like a rolling sea' (W)/ 'the ground heaves and swells like the waves of the sea' (SG); 'whole cities, yea, mountains are swallowed up' (W)/ 'sometimes cities, villages and burning mountains are swallowed up' (SG).[81] Similarly, Wesley's reference in another of his works to "sulphur, or some other flammable matter taking fire in the cavities of the Earth" expresses a similar meaning to Ellen White's "large quantities of coal and oil" which "ignite and burn."[82] Wesley's "cavities of the earth" and the meeting of "water and fire under the surface of the earth" described by Ellen White are both, also, reminiscent of the common seventeenth century concepts of separate

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77. Thomas Burnet, *The Sacred Theory of the Earth: Containing an Account of the Original of the Earth, and of All the General Changes Which It Has Undergone, Or Is to Undergo, till the Consummation of All Things*, vol. 2 (London: John Hooke, 1719). This was originally published in Latin in 1684.

78. Warren H. Johns, "Ellen G. White and Subterranean Fires. Part 1," *Ministry* 50, no. 8 (August 1977): 9-10.

79. Ibid., 9; For the quotes see Ellen White, *The Great Controversy*, 258-60, 385-6.

80. For some articles see: Ellen G. White, "Noah's Time and Ours," *Signs of the Times*, 4, no. 1 (January 3, 1878): 1; Ellen G. White, "The Flood," *Signs of the Times* 5, no. 11 (March 13, 1879): 82.

81. John Wesley, "The Cause and Cure of Earthquakes," sermon 129, first published in 1750, in *The Works of the Rev. John Wesley*, vol. 7, 1st Amer. ed. (New York: J. & J. Harper, 1826). Although the sermon appears in the *Works* of John Wesley, it has subsequently been credited to his brother Charles; Ellen White, *Spiritual Gifts*, 69-89.

82. John Wesley, *A Survey of the Wisdom of God in the Creation: A compendium of Natural Philosophy*, 2 vols. (Lancaster, PA: William Hamilton, 1810); Ellen White, *Spiritual Gifts*, 69-89.

underground spaces filled by water and fire that combined in places.[83] The close resemblance of the phrases in Wesley's work and Ellen White's meta-narrative can hardly be coincidental.

Abraham G. Werner (1749-1817): Volcanoes Fueled by Burning Coal

Warren Johns also discussed the possibility that Ellen White may have borrowed from Werner the common eighteenth century concept of volcanic activity being the result of burning coal beds.[84] Werner's *Kurze Klassifikation und Beschreibung der Verschiedenen Gebirgsarten*, 1787, (Short Classification and Description of the Different Kinds of Rock), was a truly fundamental geological publication for its time.[85] It was significant because, firstly, it contained in an incipient form the concept of a geological time scale and, secondly, his simple scheme made it possible to readily extend the scale, through the classification of local strata, into a single world-wide geological system. His basic scheme was easy to adapt and through the influence of his dedicated pupils became the basis for geological mapping throughout Europe and North America. One of his followers, Professor Robert Jameson, the president of the Wernerian Natural History Society, became the main exponent of Werner's geological system in Great Britain. It was most probably through Jameson's influence that Werner's system found its way to North America early in the nineteenth century. In 1809, for example, William Maclure published the first geological map of the United States based on Werner's classification and nomenclature.[86]

The idea that there was a connection between the combustion of carbonaceous substances and volcanic eruptions was still a common notion in the eighteenth century. Werner had adopted this view from other geologists, but it was through him that this notion became predominant in Europe.[87] In his scheme of rock classification, he recognised two categories of volcanic rocks: true volcanic rocks or true lavas and, in addition, pumice and volcanic ash. He believed that the rocks of the second category, which he called pseudo-volcanic rocks, had been formed by the burning and melting of underground combustible

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83. Ibid.

84. Warren H. Johns, "Ellen G. White and Subterranean Fires. Part 2, *Ministry* 50, no. 10 (October 1977): 19.

85. Abraham G. Werner, *Kurze Klassifikation und Beschreibung der Verschiedenen Gebirgsarten* (Dresden: Walther, 1787).

86. See Alexander M. Ospovat, "Werner's Influence on American Geology," *Proceedings of the Oklahoma Academy of Science* 40 (1960): 99; William Maclure, "Observations on the Geology of the United States, explanatory of a Geological Map," *Transactions of the American Philosophical Society*, vol. VI, part II (1809): 411-28.

87. See Archibald Geikie, *The Founders of Geology* (Baltimore: The John Hopkins Press, 1901): 62.

material. 'Burning Mountains' would then have been regarded as pseudo-volcanoes.[88] Two years later, in 1789, he discusses the "highly probable conjecture that most, if not all, volcanoes arise from the combustion of underground seams of coal."[89] Werner suggests that the most vigorous volcanoes, or 'burning mountains', would have started through spontaneous combustion on the thickest seams of coal. In the process of supporting this belief, Werner not only indicates coal but other kinds of naturally flammable materials as fuel for subterranean fires.[90] He discusses the interference of water, sulphur and iron ore with burning coal seams and the formation of volcanoes in this 1789 article.

Ellen White included several parallels in her brief reference to coal and volcanoes in *Spiritual Gifts*:

> God causes large quantities of coal and oil to ignite and burn. Rocks are intensely heated, limestone is burned, and iron ore melted. Water and fire under the surface meet. The action of water upon the limestone adds fury to the intense heat, and causes earthquakes, volcanoes and fiery issues.[91]

While it is well known that spontaneous combustion of coal seams does occur and that it may produce long-lasting underground fires with visible smoke through cracks in the Earth's surface, this is no longer considered to be a general cause of volcanoes. Ellen White's statement, therefore, had distinct time-dependent eighteenth century Wernerian connotations. While this does not necessarily imply that she had read Werner's works, it appears to demonstrate that she was influenced by some of the contemporary scientific wisdom of earlier periods. Certainly by 1864, when Ellen White published her panoramic vision narrative, the Wernerian concept of combustion of underground flammable materials as the most common causation of volcanoes and earthquakes had been completely abandoned by professional geologists in both Europe and America. The Adventist readers of her books and journal articles would not have been aware of this.

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88. Werner had a 'neptunist' perspective and considered both categories of rocks to be of a sedimentary nature; W. Mayer, "Geological Observations by the Reverend Charles P. N. Wilton (1795-1859) in New South Wales and his Views on the Relationship between Religion and Science," in *Geology and Religion: A History of Harmony and Hostility*, Special Publications, 310, ed. M. Kölbl-Ebert (London: Geological Society, 2009), 200.

89. Abraham G. Werner, "Versuch einer Erklärung der Entstehung der Vulkanen durch die Entzündung mächtiger Steinkohlenschichten, al sein Beytrag zu der Naturgeschichte des Basalts," *Magazin für die Naturkunde Helvetiens* 4 (1787-1789): 239-54.

90. See Geikie, *The Founders of Geology*, 124.

91. Ellen White, *Spiritual Gifts*, vol. 3, 79.

Thomas Dick (1774-1857): A Violent Flood, a Foreshadow of the Final Conflagration

On October 17, 1865, the *Review and Herald* editor who signed his article with simply 'G.," informed the readers that the writings of a Mr Thomas Dick, who had earned himself the sobriquet of the 'Christian Philosopher,' corroborated Ellen White's panoramic vision of the Flood in *Spiritual Gifts*, as published in 1864.[92] The editor saw it as a "source of gratification" that divine truth (from Ellen White) was confirmed by the "philosopher." Thomas Dick's description of the violent deluge as a consequence of the wickedness of man indeed shows strong similarities with Ellen White's narrated vision, yet it *pre*dates it by at least three decades.[93] Was it possible that Ellen White's vision was influenced by Dick's writing?

Thomas Dick's works on popular science and natural theology experienced an immense circulation in the United States during the nineteenth century.[94] Hundreds of thousands of Thomas Dick's books sold in America from their first publication in 1826 to well into the 1880s. His works seemed to complement perfectly antebellum America's sentiment of strong moralism and religiosity. Also, his books provided a greatly valued source of useful knowledge.[95] The popularity of these Christian works apparently resulted in their inclusion in nearly every New England clergyman's library.[96] Most public libraries carried several copies of his books and, in addition, the books were reviewed in American periodicals.[97] Reviewers in those periodicals paid particular attention to Dick's contention that humanity's fall from grace had brought about punishments in the form of natural calamities such as earthquakes and tornadoes, whether or not they were in agreement with his claims.

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92. G. [George W. Amadon?], "The Mighty Convulsions at the Flood," *Review and Herald* 26, no. 20 (October 17, 1865): 156-7; It appears that during the absence for health reasons of Uriah Smith, the Resident Editor, this being concurrent with James White's treatment for a severe stroke, George Amadon took care of Smith's editorial duties from August to December 1865 and signed articles that he placed for him in the *Review and Herald* with 'G.'.

93. Thomas Dick, *The Philosophy of Religion: Or an Illustration of the Moral Laws of the Universe* (Philadelphia: Key & Biddle, 1833), 57.

94. See Theodore D. Bozeman, *Protestants in an Age of Science* (Chapel Hill, NC: University of North Carolina Press, 1977), 59.

95. See William J. Astore, *Observing God: Thomas Dick, Evangelism, and Popular Science in Victorian Britain and America* (Aldershot: Ashgate, 2001), 171-4.

96. Ibid., 186.

97. Ibid., 182.

Methodists were especially attracted to Dick's combination of robust Christian values with a solid education.[98] Ellen White's deep Methodist roots may have contributed to her becoming familiar with the writings of Dick. The editors of the *Review and Herald* were certainly familiar with him since between 1853 and the early 1870s alone they used brief quotations from his writings as fillers of small open spaces more than a dozen times.[99] His views concerning the importance of the fourth commandment were quoted several times in the periodical. For example, "This is a commandment that was never abrogated, and which never can be abrogated, in relation to any intelligent beings, so long as the creation exists, and so long as the universe remains as a memorial of his powers and intelligence."[100] This emphasis on the importance of the Sabbath would have resonated well with Adventist doctrines. The late-nineteenth century journal editor George Amadon characterised Dick on one occasion as "that profound thinker and deep reasoner, Dr. Thomas Dick, frequently known as 'the Christian Philosopher'."[101]

Thomas Dick certainly did not hide his aversion to the use of hypotheses in geology and their conclusions he deemed to be 'hostile' to Scripture. His writings may have supported the feelings of Adventist authors. He states, for example,

> There is no subject, however, on which theorists have indulged so many wild imaginations, and attempted to support so many unfounded hypotheses as the subject of geology. Scarcely any other department of knowledge has been so encumbered with whimsical vagaries, false reasonings, extravagant assumptions, and theories founded on plausibilities, without the support of facts and extensive observations . . . In relation to this science more than to any other . . . a certain class of philosophers have been disposed to deduce from its real or supposed facts, conclusions hostile to the inspiration of the Mosaic history, and the doctrines of Revelation. [102]

Of special interest in the context of this research are Thomas Dick's descriptions of the violent nature of the Flood and its suggested connection with the wickedness of man as clearly outlined in his *Philosophy of Religion* and *The Christian Philosopher*. There are some

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98. Ibid., 176.

99. Based on a quick word search in the digital *Review and Herald* archive. Sometimes the quoted sections would be more extensive, as in Anonymous editorial [Uriah Smith?], "Antediluvian Remains," *Review and Herald* 31, no. 8 (February 4, 1868): 117.

100. Merritt E. Cornell, "Sabbath Discussion," *Review and Herald* 23, no. 15 (March 8, 1864): 114; J. Lamont, "They Say, and Do Not," *Review and Herald* 42, no. 12 (September 2, 1873): 91.

101. George W. Amadon, "The Society of Heaven," *Review and Herald* 48, no. 20 (November 16, 1876): 154.

102. Thomas Dick, *Discoveries of Modern Geology not Inconsistent with Revelation. Being the Sixth of a Series of Lectures to Young Men, delivered in Broughton Place Church, by Clergymen of various Evangelical Denominations, at Request of the Edinburgh Young Men's Society.* (Edinburgh: Q. Dalrymple, 1842), 4-5.

parallels between Thomas Dick's writings and Ellen White's panoramic vision on the implications of the wickedness of fallen humanity.

In his *Philosophy of Religion*, Dick relates how the "fountains of the great deep were broken up, the cataracts of heaven were opened, and the whole solid crust of our globe received such a shock as rent the mountains asunder, and hurled them into the plains."[103] He also noted that during the Flood "dreadful explosions resounded", and that "mighty waters hurled their billows . . . in every direction, rolling immense rocks."[104]

In her *Spiritual Gifts,* Ellen White at times used similar language. She wrote that during the flood, "water seemed to come from heaven like mighty cataracts", that the "foundations of the great deep also were broken up" and that rocks and earth were "hurled in every direction". Further, she referred to trees "hurled, with stones and earth, into the swelling, boiling billows".[105]

A more detailed account of the consequences of "the wrath of Heaven against the ungodliness and unrighteousness of men" can be found in *The Christian Philosopher*, where Dick outlines several supporting facts.[106] Firstly, he describes the marks of ruin, convulsion, and disorder visible in the interior strata of the Earth as evidence of a moral revolution – the Flood – that occurred since man was placed on Earth. The twisted and convulsed rock strata provide a "visual memorial that man has rebelled against the authority of his Maker".[107] Secondly, he was convinced that the existence of volcanoes and their violent actions "accompanied with thunder, lightning, frequent concussions of the earth, and dreadful subterraneous bellowings", are a testimony to man's depraved intelligence.[108] Thirdly, Dick referred to the ravages produced by the earthquakes. He was convinced that thousands of human beings died because "they belonged to a race of apostate intelligences, who had violated the commands of their Creator".[109] And, finally, he referred in similar vein to the effects of thunderstorms, tempests, and hurricanes. These points resonate strongly with Ellen White's theme in volume 3 of *Spiritual Gifts*.

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103. Dick, *The Philosophy of Religion*, 57.

104. Ibid.

105. Ellen White, *Spiritual Gifts*, vol. 3, 69-72.

106. Thomas Dick, *The Christian Philosopher; Or the Connection of Science and Philosophy with Religion* (Brookfield, MA: E & G Merriam, 1828), 313-22.

107. Ibid.

108. Ibid.

109. Ibid.

Dick was convinced that the discoveries of sciences such as the geology of volcanoes and earthquakes give an illustration of, and support for, the doctrine of the General Conflagration. The "Sacred Oracle" predicts that a period is approaching when "the elements shall melt with fervent heat, and the earth, and the works that are therein, shall be burned up".[110] He makes a strong connection between protology, concerned with the origin of the Earth and mankind, and eschatology, concerned with the end of the world and mankind. In his depiction of the Flood, he emphasises violent natural elements more typical of the biblical narrative of the end of the world. Ellen White uses a similar approach concerning the Flood and the end-time Conflagration.

In her narrated vision of the Flood, Ellen White introduces similar extra-biblical elements to emphasise the imminence of a violent end to this world. The burning of coal and oil, formed after uprooted trees were buried during the Flood, would cause an increase in the occurrence of "earthquakes, volcanoes, fiery issues", and underground "thunder" towards "the end of the world".[111] She similarly views what happened during the Flood as a sign of a notable increase of natural disasters just before the coming of Christ and the end of the world. "Greater wonders than have yet be seen will be witnessed by those upon the earth a short period previous to the coming of Christ. . . And there were voices and thunders and lightnings, and there was a great earthquake, such as was not since men were upon the earth, so mighty an earthquake and so great".[112] It is interesting to note that after her 1864 publication of this panoramic vision of the Flood, there followed a noticeable increase in the reporting of recent earthquakes in the Review and Herald leading magazine.[113]

Martyn Paine (1794-1877): Mountain Tops Removed and Coal's Scriptural Significance

In 1856, a lengthy article by the American literalist or scriptural geologist Martyn Paine, published in *The Protestant Episcopal Quarterly Review*, contained a number of elements that are equally pertinent to Ellen White's panoramic Flood description.[114] Martyn Paine and Ellen White concurred on the removal of mountain tops due to the Flood; the burial of the forests by the eroded materials; and the causation of volcanoes by chemical reaction

110. Ibid., 325.

111. Ellen White, *Spiritual Gifts*, vol. 3, 69-82.

112. Ibid.

113. Further reference to this tendency will be made in Chapter 4, section 4.4.5.

114. Martyn Paine, "A Review of Theoretical Geology," *Protestant Episcopal Quarterly Review, And Church Register*, vol. 3, no. 2 (April 1856): 161, 281.

such as the burning of coal. In many ways, Paine's pejoratively intended term 'theoretical' geology equated with Ellen White's depiction of 'infidel' geology. Since no human observer had witnessed the actual deposition of geological strata, geology was only theoretical.[115] The use of this term also reflected a distrust of non-Baconian science. The Bible, in contrast, offered an infallible account. Paine equally thought that theoretical geology, therefore, "opened the door for a widespread infidelity."[116]

Martyn Paine was an Episcopalian professor of medicine at the University of the City of New York. He strongly proclaimed a literal understanding of the narratives of creation and the deluge.[117] Paine shows his support for fellow scriptural geologist David Lord's *Geognosy* which he considers written "in a spirit of forbearance and courtesy."[118] He supports Lord's conclusion that "geology is not a science, and never can become one."[119] Paine's aim was to further expose any pretension of harmonising geology with divine revelation. For Paine, the coal formations of the Carboniferous were evidence of the ability of the Flood to dislodge the luxuriant antediluvian vegetation and deposit the layers of vegetation debris with strata of reworked sediment.[120] This concept of the geological action of the Flood was not novel; for example, the well-known medical practitioner and amateur geologist James Parkinson, had, in 1804, published a very similar account of the deposition of organic matter during the Flood. Parkinson narrates the retreating of the Flood waters as follows:

> When the waters attained a substantial height, there were "rushing torrents from valley to valley, breaking down, or surmounting every intervening obstacle; and laying prostrate the vast forests with which the surface was everywhere clothed . . . the waters urged by violent tempests, and agitated by receiving the immense fragments of falling mountains . . . [and] by the force of the tempestuous winds, . . . large projecting and independent portions of mountains, by their newly produced forests, would be sinking in the surrounding waters."[121]

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115. See Rodney L. Stiling, "Scriptural Geology in America," in *Evangelicals and Science in Historical Perspective*, ed. David N. Livingstone, D. G. Hart, and Mark A. Noll (Oxford: Oxford University Press, 1999),184.

116. Paine, "Review of Theoretical Geology," 171.

117. Nicolaas A. Rupke, "Five Discourses of Bible and Science 1750-2000," in *A Master of Science History: Essays in Honor of Charles Coulston Gillespie*, ed. Jed Z. Buchwald (Dordrecht: Springer, 2012), 184.

118. Paine, "Review of Theoretical Geology," 163.

119. Ibid.

120. Ibid.

121. James Parkinson, *Organic Remains of a Former World: An Examination of the Mineralized Remains of the Vegetables and Animals of the Antediluvian World; Generally termed Extraneous Fossils*, volume 1 (London: J. Robson, 1804) 257-60. Parkinson's name would eventually be attached to the degenerative medical condition that he had described as 'Shaking Palsy.

Parkinson further hypothesises the "transmutation" of the vegetable matter through chemical changes into coal.[122] During his times, Parkinson's popular books apparently bridged a gap between the works of the more academically orientated scholars and the activities of those who simply collected fossils. His early century audience was quite familiar and comfortable with the religious context of his writings.[123]

Ellen White's account of what she had seen in vision showed significant parallels with aspects of Parkinson's writings and Paine's text. Ellen White writes concerning the formation of coal:

> In some places large quantities of these immense trees were thrown together and covered with stones and earth by the commotions of the flood. They have since petrified and become coal, which accounts for the large coal beds which are now found.[124]

Paine had also alluded to the disappearance of the hills from above the surface of the ground as another immense proof of the catastrophic deluge. Ellen White equally describes the removal of mountain tops and the formation of huge hills and high mountains, although she attributed this more to the strong winds drying up the flood waters.[125] Paine further speaks out strongly against the periods of long indefinite periods that geologists required for the creation of the Earth. He, instead, explicitly explains that the six creation days were of natural duration as unambiguously confirmed by the fourth commandment.[126] Ellen White stated in a similar vein:

> The weekly cycle of seven literal days, six for labor, and the seventh for rest, which has been preserved and brought down through Bible history, originated in the great facts of the first seven days. . . . But the infidel supposition, that the events of the first week required seven vast, indefinite periods for their accomplishment, strikes directly at the foundation of the Sabbath of the fourth commandment.[127]

As noted earlier, the publication of the *Protestant Episcopal Quarterly Review* with Paine's article predated Ellen White's *Spiritual Gifts* by about eight years. Ellen White's narrative contains similar elements such as an emphasis on the literal twenty-four hour days

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122. Ibid., 253.

123. Cherry L. E. Lewis, "'Our Favourite Science': Lord Bute and James Parkinson searching for a Theory of the Earth," in *Geology and Religion: A History of Harmony and Hostility*, Special Publications 310, ed. M. Kölbl-Ebert (London: Geological Society, 2009), 123.

124. Ellen White, *Spiritual Gifts*, vol. 3, 79.

125. Ibid., 77-8.

126. Paine, "Review of Theoretical Geology," 188.

127. Ellen White, *Spiritual Gifts*, vol. 3, 90-1.

of creation linked to the fourth commandment; the violent removal of mountain tops and forests; and the connection between volcanoes and coal strata. Her account provides the vividness of an eye-witness' experience. To Paine, the coal formations established the occurrence of the general deluge, and "do more for the triumph of the Bible than any other event."[128] Similarly, Ellen White states that men, beasts, and trees buried in the earth at the time of the Flood were preserved as evidence of its occurrence, and its discovery would establish faith in biblical history.[129] Modern geologists do not think that coal formed from catastrophic accumulation of organic matter, but rather as formed in situ.

Paine recognises a greater force due to the recession of the waters of the deluge than for the rise of the waters.[130] Ellen White likewise saw a greater geological activity during the final stages of the deluge when a tempest aided the recession of the waters. She narrates the uprooting of antediluvian "immense forests" which were torn up at the time of the flood and buried in the earth.[131] Floating mats or rafts of vegetation, as noted before, was no longer a novel idea but had been suggested by, for example, Williams in 1789, Parkinson in 1804, and Penn in 1825, well before Paine in 1856 and Ellen White in 1864.[132] Ellen White and Martyn Paine differed on other interpretations. While Paine saw the coal formations specifically as evidence of the Flood, Ellen White suggested that *all* sedimentary rock strata were laid down during the Flood. However, by the time they were written the catastrophic geological deluge accounts of both Paine and Ellen White were totally out of step with the contemporary interpretations of field evidence by professional geologists. Their antiquated apologetic geological accounts were, in the eyes of most nineteenth century professional geologists, simply vestigial remains of seventeenth and eighteenth century Mosaic natural history explanations. Professional geologists identified in the rock strata a complex pattern of sedimentary deposits and structures of great similarity to many contemporary sedimentary environments. Besides evidence of high energy processes the rock record also includes many

128. Paine, "Review of Theoretical Geology," 280.

129. Ellen White, *Spiritual Gifts*, vol. 3, 95.

130. Paine, "Review of Theoretical Geology," 229.

131. Ellen White, *Spiritual Gifts*, vol. 3, 79.

132. John M. Lynch, " 'Follies of the Present Day': Scriptural Geology from 1817 to 1857," http://jmlynch.wordpress.com/2010/06/03. (accessed on November 21, 2014); John Williams, *The Natural History of the Mineral Kingdom*, vol. 1 (Edinburgh: Thomas Ruddiman, 1789); Granville Penn, *A Comparative Estimate of the Mineral and Mosaical Geologies*, vol. 2, 2nd ed. (London: James Duncan, 1825), 93-4.

intercalations of thick sedimentary deposits that indicate tranquil marine and non-marine environments not at all reflective of catastrophic flood conditions.

3.6 Subsequent Development and Enduring Impact

3.6.1 Development of the Metanarrative

While her earlier works, such as *Spiritual Gifts* were written for the guidance of the 'little flock' of fellow Adventists, later publications were written with the wider Christian audience in mind.[133] Accordingly, there are notable differences in both content and style between *Spiritual Gifts*, volume 3 (1864); *The Spirit of Prophecy*, volume 1 (1870), and *Patriarchs and Prophets* (1890).[134]

Content of the Narrative

Between *Spiritual Gifts* and *Patriarchs and Prophets* there are noticeable differences in content, particularly in those sections concerning the creation week and the Flood. For example, although not strictly geological references, the controversial 'amalgamation' statements which seemed to imply interbreeding between animals and humans were simply removed from all later editions.[135] It appears that no reasons were given for these deletions. Further, in her later books she largely eliminated phrases such as, 'I saw' and 'I was shown', which might have invited misunderstanding or distrust on the part of a non-Adventist readership. There were also some skeptical Adventists who were known to be uncomfortable with her prophetic status. There is also a decreased use of the terms 'infidel' and 'infidelity'. This fits well with a general trend that Marty observed towards the early-twentieth century in religious literature in America, when Christianity and its antagonists allowed each other increasing space for a more profitable, honest and intelligent interaction.[136]

A number of things did not change over this period. A comparison of her treatment of geological facts and processes in *Spiritual Gifts* and *Patriarchs and Prophets*, shows virtually no development in her understanding of geological concepts. Twenty-five years after first putting pen to paper on this topic, Ellen White appears to have retained her views on the

133. Arthur Patrick, Private correspondence, 2012.

134. Ellen G. White, *The Spirit of Prophecy*, vol. 1 (Battle Creek, MI: Seventh-day Adventist, 1870); Ellen G. White, *Patriarchs and Prophets* (Washington, D.C.: Review and Herald, 1890).

135. Ellen White, *Spiritual Gifts*, vol. 3, 64, 75. These 'amalgamation' statements were some of Ellen White's earliest comments on speciation. She appeared to claim that humans and animals interbred, both before and after the Flood. Much discussion and controversy surrounded them from the time of writing.

136. Marty, *The Infidel*, 11, 16.

origin of earthquakes and volcanoes. New scientific insights were not incorporated into later versions. She did, however, speak out more strongly against the naturalist methodology of the men of science which, according to her, was "false science". She remained convinced that human science could not search out the secrets of the Most High which he had never revealed to men. She seemed to imply that only (prophetic) inspiration – as she experienced – could add knowledge to the history of the Flood, not geologists. To her, in common nineteenth century Baconian fashion, plain scriptural facts were more reliable than the suppositions of geologists.

It is interesting to note that, even in 1890, some 18 years after Darwin's first use of the term, Ellen White did not explicitly mention the term 'evolution', or even the terms 'descent with modification' or 'natural selection' in *Patriarchs and Prophets*. This provides evidence that to some extent her main emphases may have remained fixated on the understandably more geological concerns of the 1850s and 1860s. Darwin first published in 1859 and it was probably some time until discussions over 'descent with modification' and 'natural selection' surfaced in Ellen White's circles. She did, of course, lament the fact that professed Christians accept the work of creation as the result of natural causes and this may be understood to refer to the increasing popularity of evolution at the time. Certainly, her denial of the vast, indefinite periods of time put forward by geologists in place of six literal days would eliminate the possibility of creation by these natural causes.

Changes in Writing Style

As has been widely noted, there is a clear change in writing style from *Spiritual Gifts* through *The Spirit of Prophecy* to *Patriarchs and Prophets*.[137] The former was characterised by a simple narrative style, with vivid and compelling short sentences and predominant use of the past tense, conveying the sense that she was reporting what she saw. In the 1870 version there was more use of a vivid present tense where narrative detail was added and the emotional state of the great controversy characters was brought out more strongly. There was also a greater use of adjectives, adverbs, and additional clauses. By 1890 the style had transformed again. Narrative detail had largely given way to moral exhortations. The style had become less vivid, containing more future tenses with dependent clauses of time and

137. Alden Thompson, "From Sinai to Golgotha, part 5: The Theology of Ellen White: The Great Controversy," *Adventist Review* 158, no. 53 (December 31, 1981), 12-3; Also Malcolm Bull and Keith Lockhart, *Seeking a Sanctuary: Seventh-day Adventism and the American Dream*, 2nd ed. (Bloomington, IN: Indiana University Press, 1989), 24-5.

purpose. An increase in abstract nouns, more use of the passive voice, and impersonal constructions have also been noted.[138] The vividness of the original version that linked it so much to John Milton's compelling style in *Paradise Lost* had diminished. This change in style was explained by Bull and Lockhart as due to the improved literacy skills of the author and also possibly to the greater influence of Ellen White's editorial assistants who helped in the preparation of her written material.[139]

3.6.2 The Enduring Impact of her Metanarrative

The lasting impact of her metanarrative has been substantial within Adventist circles and, as widely suggested, beyond Adventist circles through the popularity of the works of George McCready Price (Chapter 6) into the twentieth century (and beyond). The longevity of her narrative within the Adventist church must, at least partially, be ascribed to the charismatic authority that she portrayed and the prophetic status awarded to her.

Her Charismatic Authority and Prophetic Status

Many authors have reported on the importance of the gifted leadership of Ellen White during the early stage of the Seventh-day Adventist Church. Although Ellen White never held an official administrative position in the Seventh-day Adventist Church, she possessed, what George Knight calls, "immense charismatic authority."[140] Her charismatic authority helped her to deal with strong-minded men and this was difficult for other women to emulate.[141] This gifted authority helped her to address and captivate large audiences. Corporate Adventism and individual church members were shaped by her much-respected writings and counsels. Within the Adventist community, her authority has been attributed to her divinely endowed charisma.[142] For many Adventists, this continues to be an important factor in their experience of what it means to be a Seventh-day Adventist.

Many Adventists experience Ellen White's writings as God's message of help for His remnant church for the end time. Different from the purpose of Scripture, they were, in Ellen

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138. Bull and Lockhart, *Seeking a Sanctuary*, 24-5.

139. Ibid.

140. George R. Knight, *Lest We Forget: Daily Devotionals* (Hagerstown, MD: Review and Herald, 2008), 355.

141. Michael Pearson, *Millennial Dreams and Moral Dilemmas: Seventh-day Adventism and Contemporary Ethics* (Cambridge: Cambridge University Press, 1990), 178.

142. Bert Haloviak, "Practical Theology," in *Ellen Harmon White: American Prophet*, ed. Terrie Dopp Aamodt, Gary Land, and Ronald L. Numbers (Oxford: Oxford University Press, 2014), 160.

White's words, "the lesser light to lead men and women to the greater light."[143] She considered her writing to be divinely inspired and the acceptance of this perspective provided her a perceived divine authority amongst the church members. The authority of Ellen White's writing was, as early as 1855, acknowledged by the Advent Movement. The representatives wrote concerning her writings: "we must acknowledge ourselves under obligation to abide by their teachings, and be corrected by their admonitions."[144]

Endorsements by the General Conferences

Adventist Conference Sessions have from time to time continued to express their confidence in the writings of Ellen White, calling them on occasion, "the teachings of the Spirit of God."[145] In 1980, Belief 17 (out of then 27) which dealt with the gift of prophecy as manifested in the ministry of Ellen White, was adopted by the General Conference. The adopted Belief read in part; "As the Lord's messenger, her writings are a continuing and authoritative source of truth which provide for the church comfort, guidance, instruction, and correction."[146]

The nature of her writings, concerning its divine inspiration, have, since the beginning of her ministry, been a point of controversy outside and inside the Seventh-day Adventist Church. Even her husband, James White, at times struggled with accepting his wife's vision-based writings. In 1851, he decided unilaterally to keep her writings out of the *Review and Herald*.[147] This situation lasted until late 1855 when a report from the Conference at Battle Creek spelled out a new editorial structure for the *Review and Herald* and the Conference stated their intention to avoid "misstatements of the enemies of the present truth."[148] The

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143. Ellen G. White, "An open letter from Mrs. E. G. White to all who love the blessed hope," *Review and Herald* 80, no. 3 (January 20, 1903): 486.

144. Joseph Bates, J. H. Waggoner, and M. E. Cornell, "Address of the Conference assembled at Battle Creek, Mich., Nov. 16th, 1855," *Review and Herald* 7, no. 10 (December 4, 1855): 79; See Gerhard Pfandle, "The Authority of the Ellen G. Writings," Biblical Research Institute General Conference of Seventh-day Adventists, April 2004, http://adventistbiblicalresearch.org (accessed January 16, 2016).

145. James White, "Business Proceedings of the Ninth Annual Session of the General Conference of S. D. Adventists," *Review and Herald* 37, no. 9 (February 14, 1871): 68.

146. Fundamental Belief 17 on: SDAnet *At Issue*, "Seventh-day Adventists Believe . . . ," http:// sdanet.org (accessed July 10, 2016). At the Adventist General Conference session of 2015 the Gift of Prophecy is belief 18 and reads: "Her writings speak with prophetic authority and provide comfort, guidance, instruction, and correction to the Church." The phrase 'As the Lord's messenger' was dropped. "28 Fundamental Beliefs," http:// szu.adventist.org (accessed November 19, 2016).

147. Jonathan M. Butler, "A Portrait," in *Ellen Harmon White: American Prophet*, ed. Terrie Dopp Aamodt, Gary Land, and Ronald L. Numbers (Oxford: Oxford University Press, 2014), 9.

148. Joseph Bates and Uriah Smith, "Business Proceedings of the Conference at Battle Creek, Mich.," *Review and Herald* 7, no. 10 (December 4, 1855): 76.

young Uriah Smith was appointed as the Resident Editor instead of James White. Early in 1856, James White was officially asked by Bro. Hiram Bingham to 'make some apology' to 'our Churches' to clarify his perceived 'less estimate' of Ellen White's visions.[149] This episode was of crucial significance in securing Ellen White's prophetic role and authority within the Adventist church. The confirmation of Ellen White's visions as authoritative by the Sabbatarian leadership firmly established her status as a prophet of the Adventist Church.[150]

In 1982, a statement of affirmations and denials in regard to Ellen White's writings was issued by the General Conference of Seventh-day Adventists. The General Conference concluded that "a correct understanding of the inspiration and authority of the writings of Ellen White will avoid two extremes: (1) regarding these writings as functioning on a canonical level identical with Scripture, or (2) considering them as ordinary Christian literature."[151] The repeated confirmation of their sanctioning of Ellen White's writings by the Seventh-day Adventist General Conferences has done much to uphold their divinely endowed perception. It is therefore obvious why her thoughts on geology continued to influence nineteenth century Adventists with an interest in the creation and Flood narratives. Time and again the topic would be addressed in the church periodicals and ultimately became the reason for developing a flood-based New Geology during the early-twentieth century.[152]

3.7 Conclusion

Source analysis of phrases used in Ellen White's metanarrative of the creation days and the Flood shows that many of her geological phrasings were anchored in seventeenth and eighteenth century sources and writings of mid-century secular authors and orthodox Christians (see fig. 3.2). Exactly how their wordings and thought ended up in her

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149. Hiram Bingham, "From Bro. Bingham," *Review and Herald* 7, no. 20 (February 14, 1856): 158.

150. Ann Taves, "Visions," in *Ellen Harmon White: American Prophet*, ed. Terrie Dopp Aamodt, Gary Land, and Ronald L. Numbers (Oxford: Oxford University Press, 2014), 39; Ronald L. Numbers, *Prophetess of Health: A Study of Ellen G. White*, 3rd ed. (Grand Rapids, MI: William B. Eerdmans, 2008), Loc. 1016 of 5638 e-book.

151. Gerhard Pfandl, "The Authority of the Ellen G. Writings."; Ad Hoc Committee of the General Conference, "The Inspiration and Authority of the Ellen G. White Writings: A Statement of Present Understanding as Revised June 14, 1982," *Ministry* 55, no. 8 (August 1982):21.

152. George McCready Price, *The New Geology: A Textbook for Colleges, Normal Schools, and Training Schools; and for the General Reader* (Mountain View: CA: Pacific Press, 1923). See chapter four for the impact of Ellen White's thoughts on geology in the *Review and Herald*; chapter five for Alonzo Jones' influence on identifying geology as the cornerstone of the evolution theory; and chapter six for George McCready Price's attempt to reorganise the stratigraphic principles of geology in order to disprove a chronological system of fossils.

metanarrative is not clear and is not the emphasis of this research. The main focus was to investigate the originality and datedness of the geological thoughts used. As a reminder, it should be noted that before the nineteenth century, geology as the science of systematically examining, mapping, and explaining the occurrences of rock formations did not yet exist. During most of the seventeenth and eighteenth century the activities of the scholars that made

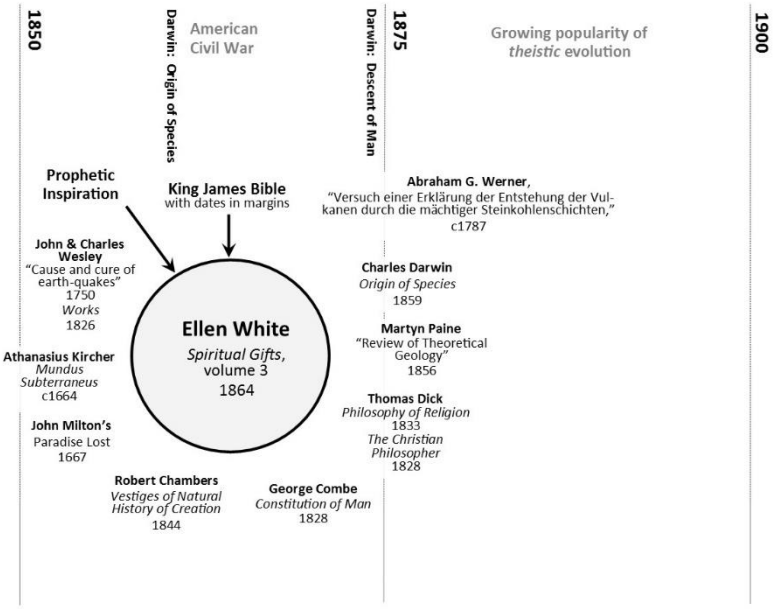


Figure 3.2. Influences recognised in Ellen White's chapters on the Creation days and the Flood in *Spiritual Gifts*, vol. 3. Absences of connecting arrows indicate resemblance noted but not referenced. Resemblance of ideas covers material from the seventeenth century to c1860.

reference to incipient geological concepts actually engaged in a more universal cosmogony.[153] Of special interest here, though, are their initial thoughts on geological concepts.

Ellen White's use of what were by then anachronistic geological views suggests that, even if aware of them, she did not intend to reflect the state of contemporary mid-century thinking. Instead, it seems she used older ideas with which she was familiar and that could easily be understood by the general public. There were certainly no novel insights in her geological phrasings. Although she expressed criticism of the infidel geologists' claim that "the world is much older than the Bible record makes it,"[154] it may be that her geological

153. See chapter two on the development of the science of geology. David R. Oldroyd, *Thinking about the Earth: A History of Ideas in Geology* (Cambridge, MA: Harvard University Press, 1996), 59-60.

154. Ellen White, *Spiritual Gifts*, vol. 3, 91.

statements were not meant to reveal new understanding of future scientific, geological thinking but, in the context of her time, simply to emphasise the importance and urgency of end time events for the Adventist believers. For this, she particularly used her interpretation of what had happened during the Flood to foreshadow the cataclysmic nature of the Final Conflagration.

Ellen White's view of scientific methodology reflected the deep chasm that had developed between the knowledge-accumulating research activities based on the testing of working hypotheses, the methodology increasingly used by practising professional geologists, and the naïve factual Baconianism which continued to be favoured by conservative Christian groups. Ellen White considered geology as conventionally practiced, to be false science because it did not accommodate the biblical Mosaic narrative; it did not consider supernatural events; and because its use of assumptions was not perceived as truly factual.[155] The Bible, in comparison, was based on facts and provided truth. Where she saw disagreement between the results of the naturalist methodology and her interpretation of Scripture, she considered that to be the result of false science, of which the people *had* to be warned.

Because of her charismatic authority and the prophetic nature awarded to her writings, her message would become widely spread via her books, the Adventist periodicals and sermons. The next chapter deals with the conveyance of geological thought as influenced by Ellen White's metanarrative via the flagship Adventist journal, the *Review and Herald.* Uriah Smith was for most of the second half of the nineteenth century, as Resident Editor (besides James and Ellen White), the most significant influence on what was to be published in the journal.

155. Not only geology was considered a false science (in conflict with scripture), the natural sciences in general were suspect. Ellen White, although she was not against science, warned people about the great dangers attached to studying science. In *Education* (Mountain View, CA: Pacific Press Publishing Association, 1903), 227, she writes: "The study of science, which should impart a knowledge of God, is so mingled with the speculations and theories of men that it tends to infidelity." She warned Christians "against the sophistry in regard to geology and other branches of science falsely so called, which have not one semblance of truth," in "True Christianity," *Review and Herald* 75, no. 9 (March 1, 1898), 133.

Chapter 4

Uriah Smith, Editorial Tone-Setter of the *Review and Herald* Magazine

> God designed that the discovery of these things [men, beast, and trees buried] in the earth, should establish the faith of men in inspired history.
>
> —Ellen G. White, *Spiritual Gifts*, vol. 3

> Truth shall spring out of the earth . . .
>
> —M. F. Cornell, "Science vs. The Bible"; Psalm 85:11a [KJV]

> The rocks don't lie.
>
> —David R. Montgomery, *The Rocks Don't Lie*

4.1 Introduction

The charismatic authority of Ellen White's writing would have a lasting effect on many Adventists. Possibly the first written reaction by any of the Adventist elders to Ellen White's Great Controversy vision came from the young new editor, Uriah Smith. Ellen White's metanarrative of the nature of the Creation days and the Flood had ostensibly hailed from a grand two-hour vision she experienced on a Sunday afternoon, on March 14, 1858, in Lovett's Grove, Ohio.[1] The particular date of her first vision on the Creation days and the Flood is not clear. Ellen White states that most of the Great Controversy matter associated with the 1858 vision she had also seen ten years before.[2] Whether or not initiated by communication between Ellen White and Smith subsequent to this vision, Uriah Smith placed a sizeable front-page editorial article in the *Review and Herald* under the title, "Geology", by the end of the same year, on December 16, 1858.[3]

Remarkably, some five years earlier, during March to August, 1853, Smith had, *before* he even formally started his employment with the Adventist *Review and Herald*

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1. James R. Nix, "A Monumental Vision," *Adventist Review* 185, no. 8 (March 20, 2008).

2. Ellen white stated that "most of the matter of the Great Controversy which I had seen ten years before [1848?], was repeated, and I was shown that I must write it out." Ellen G. White, *Spiritual Gifts*, vol. 2, (Battle Creek, MI: Seventh-day Adventist, 1860), 270.

3. Uriah Smith, "Geology," *Review and Herald* 13, no. 4 (December 16, 1858): 28.

magazine, already developed perceptions, independent from those of Ellen White, considering the influence of natural causes, false scientific reasoning and the occurrence of catastrophic natural events as a foreshadowing of the cataclysmic end time. During his almost 50-year tenure as the editor of the *Review and Herald*, he would continue to place articles of a geologic nature regularly as both a warning of its inherent infidelity and the foreshadowing of catastrophic signs just before the Second Advent. Besides his own editorials, many articles were sourced from other trustworthy orthodox denominations which had a comparable attitude towards 'theoretical' geology. Other Adventist elders would also regularly contribute material on the topic for the magazine often in the form of their printed sermons. Ellen White's regular articles, besides reprints of relevant sections of her *Spiritual Gifts*, would only rarely mention geology directly but rather discuss the topic of science and the Bible. Because of the trusting relationship that developed between Smith and the *Review and Herald* readership, his editorials and thoughtfully chosen articles would potentially have a formative impact on his audience. This included a perception of the implications of the infidel science of geology on aspects of their spiritual life.

4.2 Relevant Experiences during his Early Years

Uriah Smith was one of the early pioneers that would help shape the Seventh-day Adventist Church. His life and work experiences have been told in several biographical books and articles and has also been the topic of academic theses.[4] His life story has remained of interest to Adventists, and the most recent biography appeared in 2014. In it, Gary Land offers many new and deep insights into Smith's personality and shows how Smith's conservative views over time increasingly conflicted with a changing church and world.[5] Within the church, for example, he seriously struggled with aligning himself with the essence of the 1888 Minneapolis message of 'righteousness by faith.' Detached from gradually changing approaches in the study of the natural sciences, his strict Baconian perception of the relationship between science and the Bible remained staunchly unchanged. This determined

4. Richard J. Hammond, "The Life and Work of Uriah Smith" (master's thesis, SDA Theological Seminary, 1944); Erwin R. Gane, "The Arian or Anti-Trinitarian Views Presented in SDA Literature and the Ellen G. White Answer" (master's thesis, Andrews University, 1963); Eugene F. Durand, "Yours in the Blessed Hope, Uriah Smith" (PhD diss., George Washington University, 1978); Eugene F. Durand, *Yours in the Blessed Hope, Uriah Smith* (Washington, DC: Review and Herald, 1980); George R. Knight, *Angry Saints. Tensions and Possibilities in the Adventist Struggle over Righteousness by Faith* (Washington, DC: Review and Herald, 1989); Gary Land, *Uriah Smith: Apologist and Biblical Commentator* (Hagerstown, MD: Review and Herald, 2014).

5. Land, *Uriah Smith*, 243-7.

conservative Baconian perspective strongly influenced his reporting on the engagement between geological and Adventist thought. None of the published biographical works have touched on his views regarding geological thought. Beyond biographical works, only Ronald Numbers makes some brief observations on editor Smith's negative attitude towards geologists and their fallacious science.[6]

This chapter will analyse Smith's contribution to Adventism's nineteenth-century reaction to the new science of geology. Of particular interest are his young adult experiences that helped shape his perspective on the rapidly maturing science of geology. By the age of twenty-one, he already expressed strong opinions concerning scientific principles and the role of natural causes. The greater part of the chapter considers his editorial imprint on and guidance of the engagement between geological and Adventist thought during the second half of the nineteenth century.

From an early age, Smith had grown up in the heartland of early Adventism. His birthplace, West Wilton, New Hampshire (New England), was to become the site of the first Seventh-day Adventist Church. His mother, Rebekah Smith, had a Baptist family background but decided to join the Millerite Adventists during the 1844 Movement. Smith was baptised at the age of 12 by an Adventist elder in the summer of 1844. He had been amongst those awaiting the Second Advent on October 22, 1844. The Great Disappointment afterwards caused him, during his adolescent years, to distance himself temporarily from religious thoughts.

After schooling for several years at the high school in nearby Hancock, Uriah entered the reputable Phillips Academy at Exeter, New Hampshire. There, he became a member of the school's prestigious Golden Branch Society, an elite society to train young men in public speaking. As a tribute to his developing writing skills, Smith was, twice in a row, asked to write the society's anniversary poem.[7]

Curiously, both poems stand out by a complete lack of references to God or spiritual life. The poems, instead, make references to "duty," virtue," "fame," and "to make a clear and noble track upon the sands of time." Durand interprets Smith's, "lack of interest in religious matters during his academy days" as having been the product of the Great

6. Ronald L. Numbers, *Darwinism Comes to America* (Cambridge, MA: Harvard University Press, 1998): 94.

7. Durand, *Yours in the Blessed Hope*, 22.

Disappointment.[8] His high school poems stand, therefore, in stark contrast to the religious poems he would write shortly before and during his first year on the editorial team of the *Review and Herald.* His reconversion to Adventism was swift and intense; it took only several months. Land attributes Smith's ultimate decision to his mother's religious influence on him since his childhood.[9] The Phillips Academy provided a college preparatory course, and it had been his plan to enter Harvard in 1851 as a sophomore to prepare for a career in teaching. His father's unexpected financial problems put a halt to those plans and instead he briefly taught at a school and worked for a business that failed.

In 1852, Smith followed his older sister Annie in accepting the message of the Seventh-day Sabbath-keeping Adventists. After attending a Seventh-day Adventist conference in the small town of Washington, NH, from September 10 to 12, 1852, Smith proceeded for several months to investigate the Sabbath commandment and its particular application to the seventh day of the week. In December 1852, he took his public stand for the seventh-day Sabbath and was re-baptised at the age of twenty by the Sabbath-keeping Adventists.[10] After Annie had started working at the office of the *Review and Herald*, Uriah developed an equally serious interest in supporting the new denomination's cause. James White had hired Annie after reading a poem she had submitted to the paper. Smith decided to follow a similar approach and sent into the *Review and Herald* a 35,000-word poem entitled, "The Warning Voice of Time and Prophecy." James White quickly recognised Uriah Smith's mature knowledge of end-time prophecy and his obvious writing abilities. On May 3, 1853, Uriah Smith officially joined the team that produced the *Review and Herald*, the recently founded Seventh-day Adventist church magazine.[11]

4.3 Employment with the *Review and Herald*

Although Uriah Smith contributed to the Adventist cause in many meaningful ways during his life, his editorship of the *Review and Herald* was undoubtedly the most significant. Land notes how Smith would provide through his editorial work a critical unifying force for the fledgling denomination during its formative years. Throughout the nearly fifty years of employment with the magazine, his writings remained focused on prophecy and the second

8. Ibid., 187-8.

9. Land, *Uriah Smith: Apologist and Biblical Commentator*, 23.

10. Hammond, "The Life and Work of Uriah Smith," 8.

11. Durand, *Yours in the Blessed Hope*, 24.

coming of Jesus.[12] This focus undeniably influenced the orientation of his coverage of geological issues.

For the first two years of his employment, his work mainly involved type setting and engraving duties as well as the hard manual work of printing and posting the magazine. Soon, he also became involved in editorial functions and in the December 5, 1855, issue of the *Review and Herald* Smith was for the first time listed as 'Resident Editor.' Remarkably, his influence had started to be felt shortly *before* his official employment.

At the young age of twenty-one, before Smith had formally joined the editorial team of the *Review and Herald*, he had already articulated his Baconian perspective towards scientific methodology and his disagreement with the focus on natural causes and laws instead of following a literalist interpretation of Genesis. He expressed a strong historicist belief in a literal six 24-hour day interpretation and an Earth-age of about six thousand years. Smith expressed his views a decade before Ellen White would publish similar opinions in her third volume of *Spiritual Gifts*. Since the episodes of his poems featured as a regular item in the *Review and Herald* over such a lengthy period, Ellen White, no doubt, was well aware of Smith's poetry which so powerfully spelled out the Millerite and Seventh-day Adventist beliefs. Smith can, therefore, be reckoned as one of the people that may have influenced and helped to cement her later views on science, and more specifically, geology.

4.3.1 The Significance and Timing of his Doctrinal Poems Published in 1853

Smith's poems are significant because, besides their doctrinal value, they showed his initial perceptions of biblical chronology, scientific principles, man-made theories, common sense reason and philosophy, natural causes, earthquakes, the Flood, and the institution of the Sabbath. All these concepts would soon feature equally strongly in Ellen White's 1864 metanarrative.

His lengthy first poem, "A Warning Voice of Time and Prophecy," written in blank verse, ran in successive episodes in the *Review and Herald* throughout five months from March, 17 to August 11, 1853.[13] It has been suggested that Smith may have learned that form of poetry from studying John Milton's *Paradise Lost* while at Phillips Academy. Smith intended his poem to provide a general outline of the beginning, rise, and progress of the

12. Land, *Uriah Smith*, 243-4.

13. Blank verse is a type of poetry without rhyme but written with a regular meter or rhythm of the syllables.

Advent movement, as well as its prophetic connection.[14] Considering the short available time frame for completing it, he must have started working on this epic work soon after his reconversion in December 1852. It appears that by February 17, 1853, James White had already read initial sections of the poem and approved of it.

The second poem, "A Word for the Sabbath, or False Theories exposed," ran in six parts from October 18 to December 20, 1853. This time, the much shorter poem was constructed with rhyming lines. It constituted doctrine in rhyme, a not uncommon form of disseminating doctrine in nineteenth century Adventist magazines. Smith's main argument was the perpetual requirement of the Sabbath in the face of the enemy's attempts at deception. The astute twenty-one-year-old Smith had shown great maturity in the doctrinal understanding of this fundamental aspect of the Seventh-day Adventist Church. In 1980, Durand remarks that "all the arguments employed in the 130 years since 1844 had been brought forth by [Smith in] 1853 both for and against Sabbathkeeping (sic), and had been answered to the satisfaction of Seventh-day Adventists."[15] His two early poems constituted, in a way, a presentation of his credentials to the primary leaders of the Seventh-day Adventist church and established him as a leader in the perception of the magazine readers. Land noted that doctrinal positions that Smith expressed during his first years with the *Review and Herald* would remain virtually unchanged for the rest of his life.[16]

Land further recognises that within Smith's doctrinal argumentation his perception of the nature of truth, based on the typical nineteenth century common sense philosophy, could be garnered. This philosophy [see also chapter two of this thesis] showed a preference for a theistic form of common sense where Baconian inductive science with an emphasis on the collection of facts, and plain common sense moral reasoning would show God's intentions for humanity. Land states that there is no evidence that Smith had read the Scottish philosophers such as Thomas Reid and Dugald Stewart who had championed common sense reasoning based on facts rather than theories, an approach that was sympathetic with the ideas of Francis Bacon in the sixteenth century. Instead, he thinks that Smith had become familiar with the common sense philosophy while a student at Phillips Academy since Baconianism undergirded its philosophy of instruction. Thus Smith adopted a philosophy that was deeply ingrained in American contemporary culture, including its religious component. Concerning

14. Land, *Uriah Smith*, 23-4.

15. Durand, *Yours in the Blessed Hope*, 191.

16. Land, *Uriah Smith*, 29-31.

the last point, Knight mentions that the common sense philosophy had been popular with the Millerites because this approach had "avoided complicated rational explanations and focused on the facts (including biblical facts) as they appeared to the person in the street."[17]

The following examples from Smith's doctrinal poems are chosen, not to examine the validity of Smith's doctrine, but to highlight his use of Baconian common sense phraseology. It favoured facts over theories and mistrusted ('mere') inferences, hypotheses, and vain philosophical reasoning. Notably, he recurrently connects the term 'theories' with negative connotations (e.g. groundless, false). Such concepts of reason and philosophy are typified as 'idols.' Orthodox Christians objected to the contemporary emerging recognition of natural causes in the natural sciences. Not unexpectedly, Smith articulated his distrust of the use of natural causes and laws to explain phenomena in the world, especially where it could be perceived they were used to destroy belief in the seventh-day Sabbath.

Examples of an orientation toward Christian Baconianism or theistic common sense phraseology can be seen in:

> **idle**, **groundless theories** at best![18]
> Their **idols** - **Reason and Philosophy** -
> Which Gods with more idolatry they serve,
> Than ever heathen worshipped, wool or stone;
> To these they cling for aid, and as the signs
> Of **coming wrath**, are, one by one dealt out,
> Upon a sleeping World, they straight assign,
> What they term **natural causes**, and explain
> By **philosophic laws**, the wonderful
> Phenomena; then to the world exclaim,
> '
> "Tis clear, and all can be accounted for,
> On **scientific principles**!" which means,
> Interpreted, You're safe, sleep on! Sleep on![19]
>
> Deceived by lying teachers; time has proved
> Your views all groundless, and your **theories false**;[20]
> For **human wisdom with contortions wild**,
> And ill-yoked fancies, groped through many a way
> Devious and blind, and wrought **strange theories** out;
> Nor was each way its followers wanting, or
> Each **theory** advocates; sincere, perhaps,
> But **fearfully misled**.[21]

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17. George R. Knight, *Millennial Fever and the End of the World* (Boise, ID: Pacific Press, 1993), 37.

18. Uriah Smith, "The Warning Voice of Time and Prophecy," *Review and Herald* 3, no. 22 (March 17, 1853): 169.

19. Ibid., 170.

20. Uriah Smith, "The Warning Voice of Time and Prophecy," *Review and Herald* 3, no. 26 (May 12, 1853): 202.

21. Uriah Smith, "The Warning Voice of Time and Prophecy," *Review and Herald* 4, no. 3 (June 23, 1853): 17.

So rooted deep, wide-spread among mankind,
Of creeds discordant, countless hosts we find;
Theories opposed, widely conflicting views,
And men may find whatever they may choose;
But all cannot be truth; [22]
But know, O man! Such **theories false** to teach,
Is God's eternal wisdom to impeach!
No one could doubt what his **eyes could see**;
And any man of **common sense** would say,
The seventh is the one, without delay.[23]
On **human theories** dare you trust you all!
Remember, by God's law we stand or fall.[24]
The many **theories** which the world believe,
Theories upreared against the Sabbath, bold,
Their name is legion, their effects untold.
This **theory**, then, though asserted ue'er so bold,
We find **fallacious**; and it will not hold.[25]

To what would it amount? Why, nothing more
Than **mere inference**, and at that most poor!
Would those who reason thus, some foresight take,
Such **false assertions** they might cease to make;[26]
Nor strive from **vain philosophy** to draw
Insults to God, and his majestic law.
Those who are rambling off to **Nature's laws**,
Striving to gather from **effect and cause**,
Some **reasons**, as they fondly trust, which may
Stand as objections to the seventh day,
On **man-made theories**, which must surely fall,
And stranger still, that they, **presumptuous**, then,
Should, with these doctrines and commands of men,
With **baseless reasonings**, and senseless things,
Fight the stern precepts of the King of kings![27]

Smith's poetry also showed a preference for imagery that was reminiscent of John Milton's *Paradise Lost*. Such imagery would also become recognisable in Ellen White's chapters on the Creation days and the Flood in volume three of *Spiritual Gifts* (see chapter three for more on this).

Examples of Milton-like imagery resonant with Ellen White's later metanarrative:

The **earthquake** rockings ran more violent
Who, heedless of the **swelling waves** around,
Proclaim, "Prepare! For the great day of God,
The **day of wrath** and vengeance is at hand."
Or does the shadow of the **gath'ring storm**
Too dark appear, and ominous, to brave

---

22. Uriah Smith, "A Word for the Sabbath," *Review and Herald* 4, no. 15 (October 18, 1853): 114.

23. Uriah Smith, "A Word for the Sabbath," *Review and Herald* 4, no. 16 (October 25, 1853): 123.

24. Uriah Smith, "A Word for the Sabbath," *Review and Herald* 4, no. 19 (November 15, 1853): 150

25. Uriah Smith, "A Word for the Sabbath," *Review and Herald* 4, no. 20 (November 22, 1853): 158.

26. Uriah Smith, "A Word for the Sabbath," *Review and Herald* 4, no. 22 (December 6, 1853): 174.

27. Uriah Smith, "A Word for the Sabbath," *Review and Herald* 4, no. 24 (December 20, 1853): 190-1.

Its **rising fury**;[28]
And he great wonders doeth, e'en to bring
Fire down from heaven to earth in sight of men.[29]
And, lo, they knew it not, e'en till the **flood**
Came furious down, and swept them all away.
As were the days of Noah, so, too, shall be,
The days which shall reveal the Son of man.[30]
Have ye not witnessed **giant Earthquake rise**
And 'neath their ponderous tread **proud cities crush**,
And raze, with proud contempt, the works of man?
Have ye not marked the **Hurricane** unbound?
The wild **Tornado**'s furious, sweeping course,
Exulting proudly in its youthful strength?
And **rushing Floods** and hideous Pestilence,
And **Fires** with towering crest blazing aloft,

Ay, thus it is; the Son of God has said
There shall be signs above, and on the earth,[31]

Throughout, examples of a strict literal interpretation of biblical chronology are present in the poems:

For near **six thousand years**, earth's rapid course,
Shall toll its final hour, and merge in
The endless cycles of eternity.[32]
Six days alone this glorious work employed;
God on the seventh a second rest enjoyed:
For **in six days** the Lord made heaven and earth.[33]

The poems clearly provide evidence of two main perspectives that would guide Uriah Smith in his response to geological thought. Firstly, his writing exposes his contemporary Baconian common sense philosophical perspective. This outlook resulted in negative perceptions of theories and natural causes in explanation. Secondly, the poems provided evidence of his seventh-day Sabbath, Adventist theological perspective. His theological perspective led to strong prophetic end-time views and defence of the seventh-day Sabbath view.

These early influences that were so evident in Smith's doctrinal poems would guide him in the evaluation of geological thought as it impacted on Adventist doctrine during the

28. Uriah Smith, "The Warning Voice of Time and Prophecy," *Review and Herald* 3, no. 24 (April 14, 1853): 186.

29. Smith, "The Warning Voice of Time and Prophecy," (June 23, 1853):18.

30. Uriah Smith, "The Warning Voice of Time and Prophecy," *Review and Herald* 4, no. 6 (August 4, 1853): 41.

31. Ibid., 42.

32. Smith, "The Warning Voice of Time and Prophecy," (March 17, 1853): 169.

33. Uriah Smith, "A Word for the Sabbath," *Review and Herald* 4, no. 16 (October 25, 1853): 123.

rest of his life. How far the poems would have directly or indirectly influenced Ellen White's thoughts is difficult to assess, other than to note that Smith published his poems in the *Review and Herald* (1853) eleven years before Ellen White's publication of *Spiritual Gifts* (1864) and that she was a faithful reader of the *Review and Herald*.

4.3.2 Smith's Perspectives on Geological Thought

Although Smith, by holding a high school diploma from a reputable academy and having strong writing skills, was fairly well educated for his day, Hammond expresses the opinion that on the topic of Bible interpretation, Smith "was not equipped to make the deepest excursions into some of the languages essential to Bible scholarship."[34] His Bible studies were to a great extent limited to examining secondary sources such as commentaries and works of other trusted conservative authors.

It would be the same with his writings on geological topics. Without any training in geology and no ready access to primary sources such as professional geological reports, articles, and textbooks, Smith had to rely heavily on works from other orthodox Christian authors and, where possible, the widely available popular review articles. It should be realised that even the Christian writers, whose works he used, were, at best, probably equally guided by secondary geological sources. However, with a strong belief in the principles of common sense philosophy, they all wrote with the Baconian common sense confidence that they could evaluate and criticise the findings of leading professional geologists.

Smith, as a long-reigning magazine editor, would remain vigilant in his observation of national and world trends that related to the fulfilment of prophecy. He would, for example, regularly report on the occurrence and impacts of earthquakes, floods, storms, and volcanic eruptions as signs that pointed to the end of time. Because of his crucial role in the editorial team and the trusting relationship that he built up with the Adventist readers, Smith's editorials were vastly influential. Hammond notes that next to the Bible and the writings of Ellen White, Smith's editorials had *the* greatest influence on Seventh-day Adventists.[35] His views on the impact of geological thought on Adventist doctrine undoubtedly moulded the thinking of Adventist readers directly during the second half of the nineteenth century and indirectly beyond this time frame.

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34. Hammond, "The Life and Work of Uriah Smith," 55.

35. Ibid., 83, 135.

4.4 Geological Editorials in the *Review and Herald*

Firstly, Uriah Smith's editorial influences will be assessed by focussing on the authorship of the articles that contain references to geology. A list of all the articles in the *Review and Herald* that refer to geology between 1850 and 1910 is given in Appendix A. According to authorship, the articles are grouped into his own editorials on geology, those from other editors, and contributions from Adventist ministers. Within Smith's editorials the provenance of the material is also considered. All Smith's geological editorials contained sizeable copied sections from other authors who had written on the engagement between geological thought and Scripture, and with whom he strongly aligned himself. Over the years Smith would especially favour contributions from orthodox Presbyterians such as William S. Plumer and Lewis Warner Green, as well as from Congregationalists such as David Lord and Jacob Abbott. Secondly, the temporal pattern of the articles will be considered. Which temporal patterns can be identified between the mid-1850s and the end of the nineteenth century?

The term 'geology' was used in the *Review and Herald* for the first time in 1854. Smith had printed a copy of an article from the magazine *The London Quarterly Journal of Prophecy* under the title, "The Present Age: Its Boasted Progress Delusive." By placing this article from outside the Adventist Church in the *Review and Herald* without further commentary suggests that Smith supported the content. The author had warned that progress in the sciences, including geology, can be deceiving, and states, "The amount of knowledge gained may be nothing to the amount lost, or that which is gained may be so perverted or ill-regulated as to injure instead of profiting."[36] He concludes that all science – if apart from God and His Christ – is a lie or at least lodges a lie in its very core. The editorial article was Smith's first warning to the readers of the *Review and Herald* of the potentially negative nature of science, with an indirect reference to geology.

4.4.1 The 1858 Editorial

Only six months after Ellen White's Great Controversy vision in Ohio – which ostensibly included panoramic experiences of the Creation days and the Flood - Smith placed this first major editorial on geology in the *Review and Herald*. The 1858 'Geology' editorial was highly significant because it provided the blueprint for Smith's handling of geological

36. The article had been published in the *London Quarterly Journal of Prophecy* under the title "The Age." Horatius Bonar, ed., "The Age," *London Quarterly Journal of Prophecy*, 2 (January, 1850): 1-15. The article was repeated again in the *Review and Herald* of February 9 and 16, 1864.

thought in the Adventist context. Smith's approach to dealing with geology within the context of nineteenth century Adventist thinking becomes immediately evident in his first editorial attempt to assess the nature and methodology of geologists and the perceived impact of their findings on a literalist interpretation of the Genesis narratives.

The introduction of the editorial is noteworthy because here we can gather Smith's opinion. He opened the editorial with the sweeping statement, "Geology, the reader is well aware, is the great instrument which unbelievers are endeavouring to wield against the legitimacy of the Scriptures."[37] The unsubstantiated statement implied that unbelievers preferably made use of geology to undermine Scripture. He went on to explain, "There are certain formations, say they [the unbelievers], which we *conjecture* must have been ages on ages in reaching their present state; therefore the Mosaic record *is* not true. Such is a specimen of their illogical reasoning."[38] Their reasoning was deemed illogical because it was perceived to be in conflict with the Mosaic record.

He called their conclusions a form of infidelity because they did not include biblical facts. Infidelity was the popular mid-nineteenth century phrase used among orthodox churchmen to add emphasis to their statements dealing with issues they perceived to be in contrast with biblical facts. Smith, as he clarified, was not against geology *per se*, but was against the infidel use that certain men made of geology. Only fact-based geology was deemed appropriate. Such a reaction was characteristic of contemporary Baconianism. It should not be forgotten that, during this time, biblical facts were considered to have equal status with scientific facts and their interpretation constituted an equally sound science. Reasoning without biblical evidence or reasoning that went against biblical facts was seen as false science.[39] Smith considers geologists as making "fools both of themselves and their subjects."[40]

Smith used two lengthy quotations as the basis of his editorial to support his views of the illogical and infidel nature of geology as used to undermine the authority of the Scriptures. The first quoted section came from *The Bible Vindicated against the Aspersions of Joseph Barker, by Joseph F. Berg: A full Report on the Discussions on the Authority and*

37. Smith, "Geology," 28. Italics as in original article.

38 Ibid.

39. See chapter two on the nineteenth century popularity of the infidelity term and Baconianism.

40. Uriah Smith, "Geology," 28.

Inspiration of the Holy Scriptures.[41] The second quoted fragment was taken directly from much more dated material Smith had found in *The Cause and Cure of Infidelity: Including a Notice of the Author's Unbelief and the Means of his Rescue*.[42]

Context and Relevance of the First Quote

The first quote reflects a brief section of a report on a debate dealing with the authority and the inspiration of the Bible. Such public discussions were rather common during the mid-nineteenth century, and people willingly paid an entrance fee to listen to this and to express their partiality. In this particular debate, the Reverend Joseph Berg featured as the defender of the Bible and Mr Joseph Barker, a well-known 'infidel,' as the challenger. Joseph Berg was a Dutch Reformed minister and reputed champion debater. Joseph Barker was a former Methodist New Connexion preacher and compelling speaker who had developed a growing popularity as a controversialist and had become driven to point out perceived 'errors' in the Bible.[43] It was estimated that 2,400 fee-paying people attended the debate in Philadelphia over an eight-evening period in January 1854.

It should be noted that the debated relationship between geology and the Bible formed a tiny section (three out of 264 pages of transcripts) of the entire dispute. It is indeed remarkable that Uriah Smith lifted this specific brief section out of the entire debate. This selection of material provides evidence firstly, of his astuteness in finding relevant information and, secondly, his commitment to providing the *Review and Herald* readers with resource material to which most of them would not have had access. This is an example of how Smith's shrewd selection of data would affect the opinions that the magazine readers would form of nineteenth century geology. Smith, obviously biased, selected only Joseph Berg's reply as the defence for the authenticity of Scripture. He did *not* print the points raised by the 'infidel' Mr Barker.[44] It is further significant to notice that in the actual debate Joseph

41. Joseph H. Berg, *The Bible Vindicated against the Aspersions of Joseph Barker, by Joseph F. Berg: A full Report on the Discussions on the Authority and Inspiration of the Holy Scriptures* (Philadelphia, William S. Young, 1854). The publishing committee felt that it was the wish of many "hundred Christians who attended the debate" that an authorised copy of the speeches should be published under Dr. Berg's supervision. It was their opinion that the report on the debate issued by the Philadelphia Daily Register was not a fair representation of Dr. Berg's arguments. They felt that Mr. Barker got far more space in the columns of the Register and that some of Dr. Berg's arguments were not represented correctly.

42. David Nelson, *The Cause and Cure of Infidelity: Including a Notice of the Author's Unbelief and the Means of his Rescue* (New York: American Tract Society, 1841).

43. See Timothy Larsen, *Crisis of Doubt: Honest Faith in Nineteenth-Century England* (Oxford: Oxford University Press, 2007), 138, 147.

44. Barker raised points where, he thought, the Bible was contradicted by geology. These points included: the age of the earth, the time gap between the creation of the first animals and man, that death was in

Berg needed time off to formulate his reply. The next evening, he presented his rebuttal on geological matters as a near-verbatim copy of an article by the well-known orthodox Southern Presbyterian minister and educator, Reverend Lewis Warner Green.[45]

Bozeman characterises Reverend Green as someone who was convinced of "a harmony profound, stupendous, universal, between the revelations of the Bible and the discoveries of modern science."[46] More particularly, Green was of the opinion that, "*when rightly understood,*" modern geology is "intensely and profoundly Christian; . . . it tells of catastrophes long since past, and of other catastrophes yet to come."[47] Green strongly felt that evidence gathered with inductive Baconian philosophy indicated an inevitable geological catastrophe which would lead to the 'new day' as forecast in the Bible. It is not hard to imagine that Green's thought, as incorporated in Joseph Berg's reply to the infidel Mr Barker, resonated well with Uriah Smith's perception of geology as presented in his earlier doctrinal poems. The lengthy quote presented to the *Review and Herald* readers thus reflected orthodox Southern Presbyterian thought concerning mid-nineteenth century geology.

It is quite probable that the material for Green's article had originated from such sources as the *Princeton Review*, the *Southern Presbyterian Review* or other Presbyterian periodicals. Bozeman notes that Old School Presbyterian leaders kept up-to-date with the more significant geological literature as it was reviewed in their Presbyterian periodicals.[48] It becomes evident from this case that several layers of interpretation separated the intended thoughts of the pragmatic, professional field-based geologists from the developing perceptions of the armchair readers of the Adventist magazine.

The quoted section, which had originated from Green's article, contains the names of renowned European and American geologists such as Buckland, Miller, Lyell, Cuvier, de Luc, Dolomieu, and Hitchcock. Notably, Green did not differentiate between Christian and

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the world long before man's existence, that the Sun was made much longer than six to seven thousand years ago, that geology points to many catastrophes but can see no evidence of the Flood, the absence of a solid firmament with windows, and of the contradictory accounts of creation in Genesis. Berg, who entirely based his rebuttal on Reverend Green's writing, stated that geology was still in its infancy, was inherently contradictory, and doubted the validity of the Protestant geologist Hitchcock's book on challenging the Genesis account. For Barker's points see Berg, *The Bible Vindicated*, 54-5. Berg's reply was printed in Smith, "Geology," 28.

45. Lewis W. Green, "The Harmony of Revelation and Natural Science, with especial Reference to Geology," *Southern Presbyterian Review* 5 (1851-2): 93-111.

46. Theodore Bozeman, *Protestants in an Age of Science: The Baconian Ideal and Antebellum American Religious Thought* (Chapel Hill, NC: University of North Carolina Press), 81, 121-2.

47. Green, "The Harmony of Revelation and Natural Science," 97.

48. Bozeman, *Protestants in an Age of Science*, 96.

non-Christian geologists.[49] It is also clear from the article that Green, guided by a typical Baconian perspective of science, struggled to appreciate the increasing role of hypothesis-based knowledge generation in the new sciences. Particularly in the historical sciences, which included geology (see chapter 2), it had become imperative to test, adapt or abandon earlier hypotheses as new data became available. With some sarcasm Green states, "*There is not a geological theory extant which would not be overthrown, and the whole science revolutionised by the discovery of a new single fact."*[50] Geologists saw no problem with this observation and openly acknowledged this. For them, this was a chosen pragmatic methodology that encouraged their knowledge building. Hugh Miller, for example, had stated this around 1841 as follows:

> Such is the state of progression in geological science, that the geologist who stands still for but a very little, must be content to find himself left behind. Nay, so rapid is the progress, that scarce a geological work passes through the press in which some of the statements of the earlier pages have not been modified, restricted, or extended in the concluding ones.[51]

The common sense Baconian apologist critics of contemporary nineteenth century professional geologists would or could not acknowledge the practical nature of the new science because it conflicted with their orthodox perception of scientific methodology.

Context and Relevance of the Second Lengthy Quote

Smith introduced the second quote by boldly stating that its facts "belong in the same catalogue as showing the utter fallacy of geological assumptions."[52] The copied section was taken directly from Nelson's *Cause and Cure of Infidelity*. The segment was based on Patrick Brydone's eighteenth century travel journal of a visit to Italy and should, therefore, be understood in the context of prevailing geological thought in the 1770s.[53] The eighteenth-century narrative of Patrick Brydone's observations of the lava layers of Mount Etna and its potential consequences for estimating the age of the earth piqued the interest of many readers, geologists and non-geologists alike, well into the nineteenth century.

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49. Uriah Smith, "Geology," 28; Green, "The Harmony of Revelation and Natural Science," 474.

50. Uriah Smith, "Geology," 28; Green, "The Harmony of Revelation and Natural Science," 475.

51. Hugh Miller, *The Old Red Sandstone, Or New Walks in an Old Field*, 2nd ed. (Edinburgh: John Johnstone, 1842), 8.

52. Uriah Smith, "Geology," 28.

53. Patrick Brydone was a Scottish traveller and author who visited Sicily and Mount Etna several times around the 1770s. Patrick Brydone, *A Tour through Sicily and Malta in a Series of Letters to William Beckford, Esq. of Somerly in Suffolk, from P. Brydone, F. R. S.,* vol. 1 (London: T. Cadell, 1773).

It is well known that volcanoes provide excellent opportunities to study rates at which natural processes are operating and during the nineteenth century they were therefore frequently discussed in this context.[54] The most challenging part of Brydone's narrative was the story of Giuseppe Recupero (1720-1778), a canon of Catania in Sicily, and his interest in the local stratigraphy of Mount Etna. Recupero had with some trepidation deduced a potential age for the earth greater than people's common belief in Moses' 6000 years.[55] People became so intrigued by Brydone's narration of Recupero's outrageous deductions that it brought him instant fame as a travel author. Many orthodox clergymen kept the Recupero issue alive till well into the nineteenth century. It is therefore not strange that Reverend Nelson used the Recupero topic in 1841 in his *Cause and Cure of Infidelity* to show that questionable conjectures can lead to unbelief. Once believers moved into unbelief, he argued, they would not return to faith even upon hearing evidence in support of Faith.[56]

The Scottish minister and author Reverend Thomas Dick, referring to the same Recupero issue, similarly concludes that:

> it is one of the many instances of the depravity of human nature, that so many individuals are to be found, who instead of gratefully receiving every corroboration that can be found of the glorious and interesting truth of revelation, are ready to seize, with the most eagerness, every trivial circumstance, and every vague and unfounded averment that may be constructed into an argument to support their infidelity.[57]

Both ministers, Nelson and Dick, expressed no problems with the geological facts, which they saw in agreement with revelation, but they protested vehemently against conjectures that were in disagreement with their interpretation of Scripture. This same perspective on geology would frequently re-appear explicitly or implicitly in many *Review and Herald* articles relating to geology.

Reflections on Smith's 1858 'Geology' Editorial

This first editorial on the topic of geology clearly showcased the extant tension between Adventism and the new science of geology; a tension that obviously not only

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54. Martin Rudwick discussed Brydone's travel narrative in some detail. Martin J. S. Rudwick, *Bursting the Limits of Time: The Reconstruction of Geohistory in the Age of Revolution* (Chicago: University of Chicago Press, 2005), 119-22.

55. Out of fear of the reaction of his orthodox bishop, Recupero's deductions were, at his request, only published posthumously.

56. David Nelson, *The Cause and Cure of Infidelity*, 19-22.

57. Thomas Dick, *Discoveries of Modern Geology not Inconsistent with Revelation. Being the Sixth of a Series of Lectures to Young Men, delivered in Broughton Place Church, by Clergymen of various Evangelical Denominations, at Request of the Edinburgh Young Men's Society* (Edinburgh: Q. Dalrymple, 1842), 6-10.

occurred in the nascent Adventist church but had been common in most contemporary orthodox Christian denominations. It is evident that Uriah Smith vigilantly selected these two lengthy passages from American orthodox clergy to expose the Adventist lay congregation to the documented dangers of scientific infidelity and, more imperatively, to protect the Adventist and the future of the seventh-day Sabbath. Weekly celebration of the Sabbath needed, according to Adventist doctrine, to be based on a 24-hour Sabbath, similar to the six 24-hour Creation days.

The eminent Adventist biochemist Peter Edgar Hare noted that early Adventists, as was also common in other contemporary evangelical denominations, regularly ridiculed the conclusions of geologists.[58] According to Smith, geology was still in its "infancy", and its assumptions were actually "utter fallacy."[59] Geology would continue to be regularly criticised in the *Review and Herald* under Smith's editorial guidance right to the turn of the century. The general lack of geological background knowledge amongst writers and editors made it easy for misconceptions to be passed on as facts to their readers. This was the case especially when many, if not all, readers lacked any grounding in geology and would have had to blindly trust the perspectives of the editors.

4.4.2 Authorship of the Editorials

Remarkably, very few of Smith's editorials were entirely from his pen. Smith's *modus operandi* for his editorial commentaries with references to geology was to print quoted segments from other authors often without even an introduction. At times, it is hard to assess whether the opening statement was an introduction by Smith or an opening statement by the original author. Articles that appear to be his writing, and signed as U. S., are very few. Two examples are: "Scientific Folly" (July 12, 1877) and "An Important Question Again" (April 26, 1898).

In "Scientific Folly" Smith refers to an article that calculated the total number of people that had lived since the beginning of time with the implication that the earth's surface would have had to have been covered several times over in graves. He labelled the article an example of the 'ridiculous absurdity' of this type of science. He comforts the readers by stating: "Make what concessions we will to the pretensions of geology, it cannot be claimed that any traces of human beings are found further back than 6,000 years ago, the length of

58. P. Edgar Hare, "SDA Attitudes toward the Geological Sciences, Then and Now," Internal Report, 1986, 14p.

59. Uriah Smith, "Geology," 28.

time given by the Mosaic record."[60] In "An Important Question, Again", Smith explained to the readers that it was imperative to believe that the days of Genesis 1 were days of twenty-four hours and not immense periods of time; otherwise there could have been no seventh-day Sabbath. He asserts that "no one who truly believes that word will yield up its testimony to the inferences of men on geology."[61] The assertions that Smith made on the age of the earth and its period of creation were essentially no different from what he had stated in his doctrinal poems of 1853.

When an editorial article started with an introduction by Smith, it was often very brief. Examples include: "Geology" (December 16, 1858), "The Days of Creation" (January 21, 1868), "The Resurrection not Impossible" (June 15, 1869), "The Coming Earthquake" (November 9, 1869), "Geology at Fault Again" (June 14, 1870), "Science of the Bible" (October 11, 1870), "That Old Skull" (October 25, 1870), "Science and Scripture" (June 15, 1876), "Geology and the Bible" (March 31, 1885), and "Geological Mysteries vs. Biblical Revelation" (June 9, 1885).

Recurrent themes in the articles and their introductions were that factual geology would be acceptable and not in conflict with the Bible. However, geology that made use of conjectures, assumptions, hypotheses, and theories was a science of skeptics, unbelievers, or infidels. Such a science was supposed to be in its infancy, was not exact in nature, and had continuously changed its theories with its professionals committing blunder after blunder. Their chronology was false because it clashed with a literalist interpretation of seven 24-hour creation days and the 6000-year duration of man on the earth. Geologists, according to Smith, did not recognise the biblical meaning of earthquakes and its importance for heralding the final conflagration. Most of these themes Smith had highlighted in his 1858 editorial. Smith also selected articles from sources outside Adventism which he used without any editorial introduction. They spoke for themselves and served to reinforce the consequences of geological thought on a literalist interpretation of Genesis 1.

Examples of editorial articles entirely made up of quoted segments without introductions are: "Geology" (July 3, 1860), "Infidel Objections" (March 12, 1861), "Conflagration of the Earth" (February 26, 1867), "Notes on Genesis" (March 12, 1867), "The Coming Doom" (January 25 and September 20, 1870), "The Structure of the Earth"

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60. Uriah Smith, "Scientific Folly," *Review and Herald* 50, no. 3 (July 12, 1877): 20.

61. Uriah Smith, "An Important Question, Again," *Review and Herald* 75, no. 17 (April 26, 1898): 269.

(February 12, 1880), and "Earth! Earth! Earth!" (April 28, 1885). They contain perceptions of geology held by authors from other orthodox denominations whose writing Smith trusted to be in line with Seventh-day Adventist doctrine. Some notable examples from this selection follow.

Although not acknowledged by name, William Swan Plumer (1802-1880) was the author of the (1860) "Geology" article in the *Review and Herald*.[62] Plumer was an American, Presbyterian minister and graduate of Old Princeton, who was foremost known for his doctrinal writings.[63] He was seen by many as one of the intellectual leaders of the Presbyterian Church in the nineteenth century. The article originated from a brief section on geology in his 1848 booklet, *The Bible True, and Infidelity Wicked.* The article was significant to Adventism because it contained assertions that were supportive of the nascent Adventist perception of geology.

Plumer was convinced that there were no discrepancies between the statements of the Bible and the teachings of geology concerning the creation and the flood. He acknowledged the existence of the science of geology but added that it was "yet incomplete" and "in a state of rapid advancement," and that some geologists make "hasty and rash assertions."[64] He further characterised it as a science that was not "demonstrative," suggesting that it was not a real science like mathematics or physics.[65] The contradictory assertions of some geologists still testified, according to him, of the "low state of the science," which made some "sober men doubt whether geology has any claims to the rank and dignity of a science."[66] Plumer struggled to accept that all geological processes work as slowly as witnessed near the surface of the earth because that is hard to rhyme with God's swiftness of divine operation of the laws of nature. Remarkably, Plumer states that "the first verse of Genesis may relate to a period millions of ages prior to the events noticed in the rest of the chapter." [67] He further concludes, in contrast with historical evidence, that geologists still believed that the Earth had been subjected to a deluge not further back than five or six thousand years.

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62. The article carried the same title as Smith's 1858 editorial

63. "Conviction and Conversion by Dr. William S. Plumer," *A Puritans Mind Blog,* http://apuritansmind.com (accessed July 12, 2016).

64. William S. Plumer, *The Bible True, and Infidelity Wicked* (New York: American Tract Society, 1848), 47.

65. Ibid.

66. Ibid., 48.

67. Ibid., 50.

By choosing the article for placement in the *Review and Herald*, Smith showed himself to be comfortable with the views of the Southern Presbyterian Church concerning geology and that they could be of help in formulating and reinforcing the Seventh-day Adventist Church's position on the challenges of modern geological thought. Almost a year after Plumer's promotion of the utilisation of the gap theory to seek harmony between geology and Genesis, another article followed with a similar solution. In 1861 Smith placed a copied section of Abbott's Magazine in the *Review and Herald* that read:

> The first chapter of Genesis, in its details, is not an account of the original creation of the globe, but of its adaptation to its present purposes, and of the introduction of man upon its surface. 'In the beginning God created the heavens and the earth.' When was 'the beginning?' Does Moses say it was but six thousand years ago? No such thing. Moses says not one word upon the subject. For aught we are told, it may have been millions of ages.[68]

Did this view comport with Smith's thoughts or did he put it out for the readers to ponder over? Certainly he had no objection to using such material.

Recurrently Smith brought articles relating to earthquakes to the attention of the readers. Especially after the significance that Ellen White had given to earthquakes in volume three of *Spiritual Gifts* as signs of the Great Conflagration at the end of time, earthquakes became a frequent topic of articles in the *Review and Herald*. On November 9, 1869, Smith used such an article by the Adventist hymnist and minister Daniel Thompson Taylor (1823-1899) entitled, "The Coming Earthquake." Taylor highlighted the prophetic meaning of the occurrence of earthquakes in a similar fashion to Ellen White.[69] Taylor wrote:

> . . . earthquakes, may be thought by some, to belong more properly to the domain of physical and geological science, rather than to a scriptural disquisition, but a phenomenon so often noted and marked in the sacred writings cannot be ignored by the Christians, and thrown over into the sphere of more worldly wisdom, as if it were wholly and solely a matter of speculation, and no part of the revelation of God. All true science waits upon the Bible and the Bible's author.[70]

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68. [Abbott's Magazine?], "Infidel Objections," *Review and Herald* 17, no. 17 (March 12, 1861): 130. The correct name appears to be Abbott's *Religious Magazine*.

69. Ellen White was familiar with and, for example, quoted from Daniel T. Taylor's *The Reign of Christ on Earth: or, The Voice of the Church in All Ages* (1893) in *The Great Controversy* (Mountain View, CA: Pacific Press, 1911), 302.

70. Daniel T. Taylor, "The Coming Earthquake," *Review and Herald* 34, no. 20 (November 9, 1869): 153-5. Daniel T. Taylor initially belonged to the Methodist Episcopalian Church but after listening in 1843 to the doctrine of the pre-millennial advent of Christ, dissolved his connection with Methodist Episcopalian Church and identified himself with the general body of Advent Christian faith. "Elder Daniel Thompson 'D. T.' Taylor," http://findagrave.com (accessed July12, 2016).

Taylor would use similar phraseology as employed by Ellen White. They include statements such as the storage of fire in the interior cavities of the globe, and the existence of fires "deep down around and below the bases of mountains, which they set on fire and excite to volcanic action."[71] A few months later, another article on earthquakes by Taylor appeared on January 4, 1870, entitled, "The Great Earthquakes in New England in the Eighteenth Century."[72] The New England earthquakes had helped to convince many people in the region of the soon coming of Jesus Christ. On January 25, 1870, there followed another brief article based on Daniel Taylor's writing with the title, "The Coming Doom," with references to volcanoes and the caverns and bowels of the earth filled with raging fires that shake the crust.[73] These articles reinforced Ellen White's metanarrative on volcanoes, earthquakes and raging fires in the cavities of the earth. They also showed that Ellen White was not the only one to continue to entertain antiquated pre-nineteenth century geological concepts. Placement of such articles in the *Review and Herald* further alienated Adventist laypeople from contemporary professional geological thought.

Another article published without editorial introduction was, "The Structure of the Earth"[74] Its author was the Presbyterian millenarian David Nevins Lord. This was a highly significant article because David Lord was endorsed by several leading Adventists and his textbook was used at the Battle Creek Academy. Several elders had a copy of his *Geognosy* (see fig. 4.1), which charted so clearly the controversy between Genesis and geology and the implications of giving up one's belief in the literality of Genesis.[75] Lord advocated a factual 'geognostic' science rather than a geological science full of assumptions and inferences that led to conflicts with literal interpretations of the Mosaic narratives of Genesis. He provided substance to Adventist arguments on the age of the earth as well as the defective non-Baconian nature of reasoning in the science of geology.

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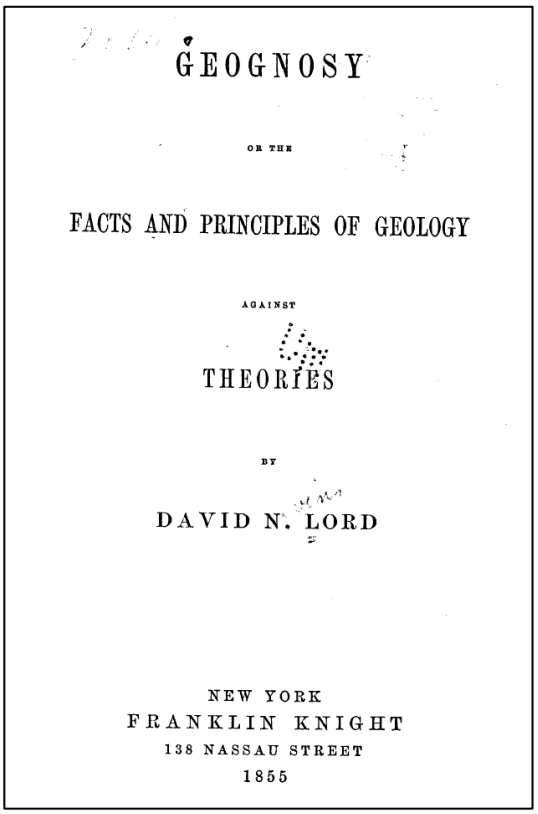
71. Ibid., 155.

72. Daniel T. Taylor, "The Great Earthquakes in New England in the Eighteenth Century," *Review and Herald* 35, no. 2 (January 4, 1870): 10-11.

73. Daniel T. Taylor, "The Coming Doom," *Review and Herald* 35, no. 5 (January 25, 1870): 35.

74. David Lord, "The Structure of the Earth," *Review and Herald* 55, no. 7 (February 12, 1880): 2-3.

75. David N. Lord, *Geognosy or the Facts and Principles of Geology against Theories* (New York: Franklin Knight, 1855); Ronald L. Numbers, "Science Falsely So-Called: Evolution and Adventists in the Nineteenth Century," *JASA* 27 (March 1975): 18-23.


GEOGNOSY

OR THE

FACTS AND PRINCIPLES OF GEOLOGY

AGAINST

THEORIES

BY

DAVID N. LORD

NEW YORK
FRANKLIN KNIGHT
138 NASSAU STREET
1855

Figure 4.1. Title page of David Lord's *Geognosy* (1855).

The 1880 Lord article published in the *Review and Herald* is a copy of the first chapter of *Geognosy* (1855) and stood apart from all other geology-related articles that had appeared in the *Review and Herald* in that it made a real effort to analyse, though one-sided, the nature of geological thought. Adventist Elder Alonzo Jones would soon follow a similar approach in analysing geological thought by perusing Archibald Geikie's (1882) *Text Book of Geology* (see chapter five).

4.4.3 Editorial Articles from Other *Review and Herald* Editors

During Smith's brief absences from the editorial desk, others in the *Review and Herald* offices would temporarily perform his editorial duties (e.g. James White, George Amadon, J. N. Andrews, Alonzo Jones). They followed the same approach that Smith had modelled. They chose relevant material that rhymed with the Adventist response to geology, and added brief introductions to copied sections from other authors.

On January 5, 1864, James White in, "The Renovation of the Earth", inserted a section from Thomas Dick, who had written on the coming purification of the earth in

comparison with the earlier punishment of the ungodly by the Flood.[76] This time the destruction, Dick writes, will not be by water but by fire through the unleashing of geological forces: "imprisoned fires will be let loose . . . earthquakes shall rend it . . . volcanic eruptions shall change it."[77] It is interesting to note that Ellen White's husband showed that he was aware of Thomas Dick's earlier writings shortly before the publication of volume three of *Spiritual Gifts* that contained similar sentiments.

During Smith's sick leave in 1865, acting editor 'G.' was especially vigorous in his approach.[78] On October 17, 1865, in an article entitled, "Geology and the Bible," G. brashly wrote in the introduction:

> They [skeptics, infidels] attempt to oppose science against revelation, and foremost in this comes the dreamy, incoherent utterances of geologists. Geology they say, proves that the Pentateuch is a fable, and that the earth was created millions of years since, and thus the faith of some is overthrown.[79]

Without any background in the science of geology, G. sweepingly referred in a derogatory fashion to geologists as dreamy incoherent scientists. He expressed himself, in alignment with Ellen White's views, to be against an age of millions of years for the earth. G.'s view differed from Plumer's opinion as printed earlier in 1860 and the age view expressed in the segment of Abbott's Magazine in 1861. This contradiction would have caused confusion amongst the readers, but no authoritative statement was made in the magazine other than what was stated in Ellen White's *Spiritual Gifts*.

In the same magazine issue, G. placed a section of Thomas Dick's writing in comparison with and in support of a fragment of Ellen White's *Spiritual Gifts* on the violent nature of the Flood. The editor used Dick's thoughts to praise Ellen White's metanarrative concerning the flood and to boost her profile amongst the readers. He concludes, "It is ever a

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76. James White, "The Renovation of the Earth," *Review and Herald* 23, no. 6 (January 5, 1864): 41. No further reference on the source of Thomas Dick's material was provided by James White. Thomas Dick had been brought up according to the strict principles of the Presbyterian United Secession Church of Scotland. No further reference on the source of Thomas Dick's material was provided by James White.

77. James White, "The Renovation of the Earth," *Review and Herald* 23, no. 6 (January 5, 1864): 41. No reference on the source of Thomas Dick's material was given by James White.

78. During the absence for health reasons of Uriah Smith, the Resident Editor, this being concurrent with James White's treatment for a severe stroke, George Amadon took care of Smith's editorial duties from August to December 1865 and signed articles that he placed for him in the *Review and Herald* with 'G.'

79. G., "Geology and the Bible," *Review and Herald* 26, no. 20 (October 17, 1865): 157

source of gratification to see divine truth [Ellen White's metanarrative] confirmed by the historian, the philosopher [Thomas Dick], or the man of science."[80]

A week later, G. followed up with another challenging article with the provocative title, "The Blunders of Geologists." This time, he writes in his introduction,

> It is a well-known fact that most of the geological theories extant impinge against the plain teachings of God's word. Geologists would have us to know that *their* theory is correct, no matter what prophets and apostles may say to the contrary; thus divine truth must be sacrificed on the altar of geological speculations.[81]

Besides this negative message, G. was, however, pleased to report that there were still *some* men of culture and thought in the churches, "who take a bold stand against such soul-destroying sentiments." [He was referring to the Jacobus' *Notes* and the writings of Mr (David) Lord].[82] The sizeable segment that G. included in the article came from *The Evangelical Repository and United Presbyterian Review*. By choosing this source, the editor showed continuing trust in the perception of Presbyterian writers on the issue of Geology and Scripture. As a result of this type of editorial, the Adventist readers continued to receive a prejudiced, derogatory opinion of geologists as inadequate scientists. G. assumed that the *Review and Herald* readers agreed with his blanket statement that most of the contemporary geological theories were in conflict with God's word. Concerning the attempts of geologists to determine geological time, J. N. Andrews chose abstracts from the Reverend R. Patterson, originally published in *Family Treasury*, to highlight the "extravagant pretensions" and "absurdity" of geology to the common reader. The clearly biased Reverend Patterson had no good word for the preposterous results of geologists.[83] On another occasion, Elder Andrews highlighted the absence of biblical facts in naturalist geological speculations. The present crust of the earth should, according to him, be explained by incorporating "two facts that the

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80. G., "The Mighty Convulsions at the Flood," *Review and Herald* 26, no. 20 (October 17, 1865): 157.

81. G., "The Blunders of Geologists," *Review and Herald*, 26, no. 21 (October 24, 1865): 161. (161-2)

82. The 'Jacobus *Notes*' refer to Melanchthon Williams Jacobus, Sr., *Notes: Critical and Explanatory on Genesis*, 2 vols. (Philadelphia: Presbyterian Board of Publication, 1864 & 1865). Jacobus was an American Presbyterian minister and writer; As to the 'writings of Mr Lord,' it is not clear which of the brothers Lord is referred to here but it seems most likely it was David Lord, whose book *Geognosy of the Facts and Principles of Geology against Theories* had appeared eight years prior to this article. Excerpts of *Geognosy* would be reprinted later in the Adventist journals and it would become a prescribed geology text at the Battle Creek College.

83. J. N. Andrews, "Geological Chronology," *Review and Herald* 35, no. 7 (February 8, 1870): 51. The *Family Treasury* referred to is possibly *The Churchman's Shilling Magazine and Family Treasury*. Andrews does not provide further reference. A web search on the article has not been successful.

Bible insists upon as of the highest importance."[84] The two facts comprised, firstly, "the fall of man and the consequent curse of God which came upon our earth," and secondly, "the complete breaking up and destruction of the crust of the earth by the deluge, and its subsequent elevation when God restored the dry land."[85]

4.4.4 Articles with Geological Content from Adventist Elders

Uriah Smith gave ample space to other Seventh-day Adventists [who were not on the editorial team] to voice their opinions on geological issues. Some leading Adventist elders who contributed perspectives on the influence of geological thought and Scripture were: Daniel T. Bourdeau, J. O. Corliss, E. P. Daniels, M. F. Cornell, Alonzo T. Jones (see chapter five), M. E. Kellogg, and D. E. Lindsey. A few examples are shown below.

Daniel T. Bourdeau (1835-1905) of Canadian heritage had converted to Adventism in 1856 and was ordained to the ministry in 1858. On the topic of the duration of the seventh-day Sabbath, he objected to the deductions of geologists and expressed sentiments that resonated with those of Uriah Smith in his 1858 geology article. He reiterated that Geology was only in its infancy, and that "we have nothing to say against geology as a science; but we do enter our solemn protest against that science falsely so-called, which makes the word of God of none effect."[86] Not long after, in January 1861, he repeated the same sentiments.[87]

In a sermon preached at Battle Creek and reprinted in the *Review and Herald*, Adventist Elder J. O. Corliss highlighted some familiar statements concerning geology. The elder restates that he has no problems with the facts of the formations existing in the earth's crust, but contends that "the *theories* of geologists, contemplated in the light of science, are not altogether founded in truth."[88] He also states that the inference of the age of the earth based on a hypothesis was "wholly unscientific and utterly worthless."[89] Because geology has no laws peculiar to itself by which exact results can be reached, Corliss reminded the

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84. [J. N. Andrews?], "Geological Epochs Marked in the Bible," *Review and Herald* 66, no. 36 (September 10, 1889): 568. The article is signed 'J. N. A.' The initials strongly suggest that it was John N. Andrews but it has been brought to my attention that Andrews had been dead 6 years in 1889. This needs further investigation.

85. Ibid.

86. Daniel T. Bourdeau, "The Sabbath did not originate with the Jews," *Review and Herald* 14, no. 12 (August 11, 1859): 93-4.

87. Daniel T. Bourdeau, "Truth vs. Spiritualism," *Review and Herald* 17, no. 8 (January 8, 1861): 62.

88. J. O. Corliss, "Geologists vs. the Mosaic Record," *Review and Herald* 55, no. 8 (February 19, 1880): 116.

89. Ibid.

congregation that geology was not a demonstrative science. The conclusion of it all was, according to him, that "geology as commonly taught is in opposition to the word of God, and should be avoided as a science falsely so called."[90]

In reaction to the still growing popularity of the evolution theory, during the early-1890s, Elder M. F. Cornell felt stirred to "show that scientists [including geologists] are out of harmony with revelation, reason, and analogy."[91] Such scientists are "in conflict with true science, and their theories are subversive of fundamental truth, religion, and morality."[92] To convince the readers, Cornell brought up unsubstantiated anecdotes such as that "in numerous instances, live toads and frogs have been found embedded in solid rock, deep in the earth."[93] He was convinced that "geologists will not admit these facts, for the reason that their strata theory would make these [live] creatures millions of years old."[94] The readers had no means to investigate the anecdote and would take the word of their elder to believe in the scientific dishonesty of the geologists. Even at the turn of the nineteenth century, Ellen White continued to warn the readers against the "the sophistry [misleading and invalid reasoning] in regard to geology and other branches of science falsely so-called, which have not one semblance of truth."[95] Despite its scientific achievements geology would remain a tarnished science in Adventism.

4.4.5 Temporal Trends in Geology-related Articles in the *Review and Herald*

The temporal analysis in this thesis will look at the time periods from 1850 to 1863, 1864 to 1879, and 1880 to 1903 periods (see fig. 4.2) which were labelled by Francis Nichol

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90. Ibid., 117.

91. M. F. Cornell, "Science vs. the Bible," *Review and Herald* 69, no. 17 (April 26, 1892): 258.

92. Ibid.

93. Ibid. A similar story exists from Eleazar Lord. Richard Perry Tison cites an incident whilst Lord visited a limestone quarry in Liverpool during his 1817 European travel. Lord narrates: "The rock was blasted out in large blocks, at the depth of twenty feet from the surface, which on rolling over parted in the middle and disclosed an opening which was occupied by a large frog. The frog was there. Its shape was of the size and conformed to the open space . . . It must have been imbedded when the rock was formed." See Richard Perry Tison, "Lords of Creation: American Scriptural Geology and the Lord Brothers' Assault on 'Intellectual Atheism' " (PhD diss., University of Oklahoma, 2008), 229-30; Autobiography of Eleazar Lord, LL.D., Historical Manuscript 88230: 122-3, Connecticut Historical Society, Hartford, CT. Such narratives were not uncommon during the nineteenth century. Most were accounts based on hearsay. Charles Dickens gave such an account in: *All the Year Round: A Weekly Journal*, vol. 8, 1862-3 (London: Chapman and Hall, 1863), 255; Benjamin Franklin upon visiting a quarry near Paris was told a similar story. Benjamin Franklin, *The Works of Benjamin Franklin*, ed., Jared Sparks (London: Benjamin Franklin Stevens, 1882), 255.

94. Cornell, "Science vs. the Bible," 258.

95. Ellen G. White, "True Christianity," *Review and Herald* 75, no. 9 (March 1, 1898): 133.

as belonging to the theological phase of Adventist flood geology.[96] 1850 is chosen as the starting date because the first issue of the *Second Advent Review, and Sabbath Herald* was published in Paris, Maine in November 1850. 1864 is chosen as the next significant date because it saw the publication of Ellen White's authoritative third volume of *Spiritual Gifts*. The period between 1864 and 1880 would subsequently be characterised for Adventists by increasing support for Ellen White's persuasive metanarrative of her panoramic experience of the Creation days and the Flood. The year 1871 saw the publication of Charles Darwin's, *Descent of Man*. As a reaction to this, the period from 1880 to 1903 showed, firstly, ardent reactions to the increasing popularity of a theistic interpretation of evolution in the larger and longer established denominations, and, secondly, the growing perception among orthodox Christians of geology as a strategic precursor to evolutionary theory.

During the first half of the theological phase, geology was questioned for its own aims and characteristics and contrasted with the Mosaic narrative. Within this phase, Uriah Smith's 1853 poems and 1858 editorial on Geology were arguably major tone-setting articles in this perceived conflict between scientific geology and the interpretation of the Holy Scripture. Most of Smith's editorials and chosen articles after 1858 would continue to bring out the same arguments but in a variety of different textual settings. Those editorials helped to anchor the way Adventism was to respond to the perceived challenges of modern geology. Uriah Smith depended particularly on outside sources and even allowed divergent perspectives from "secondary creationists" to appear in the *Review and Herald.* Secondary creationists allowed for a long time gap between the initial verses of Genesis chapter 1. Surprisingly, the suggestion of a time gap was not challenged by the readers.

From 1861 to 1865 North America had experienced its Civil War. The Civil War had been a nationwide catastrophe with a profound impact on all aspects of American society. Men were sent to fight one another resulting in huge casualties on both sides. Everyone was somehow affected by the carnage, including those living in the northeast, far from the scene of battle. The war caused great fear and led to the dislocation of the entire American society on an unprecedented scale. During this period very little was written on the impact of geological thought on the interpretation of the Genesis record. This changed when towards

96. Francis Nichol, ed., *Seventh-day Adventist Bible commentary*, vol. 1 (Hagerstown, MD: Review and Herald, 1978), 72-3.

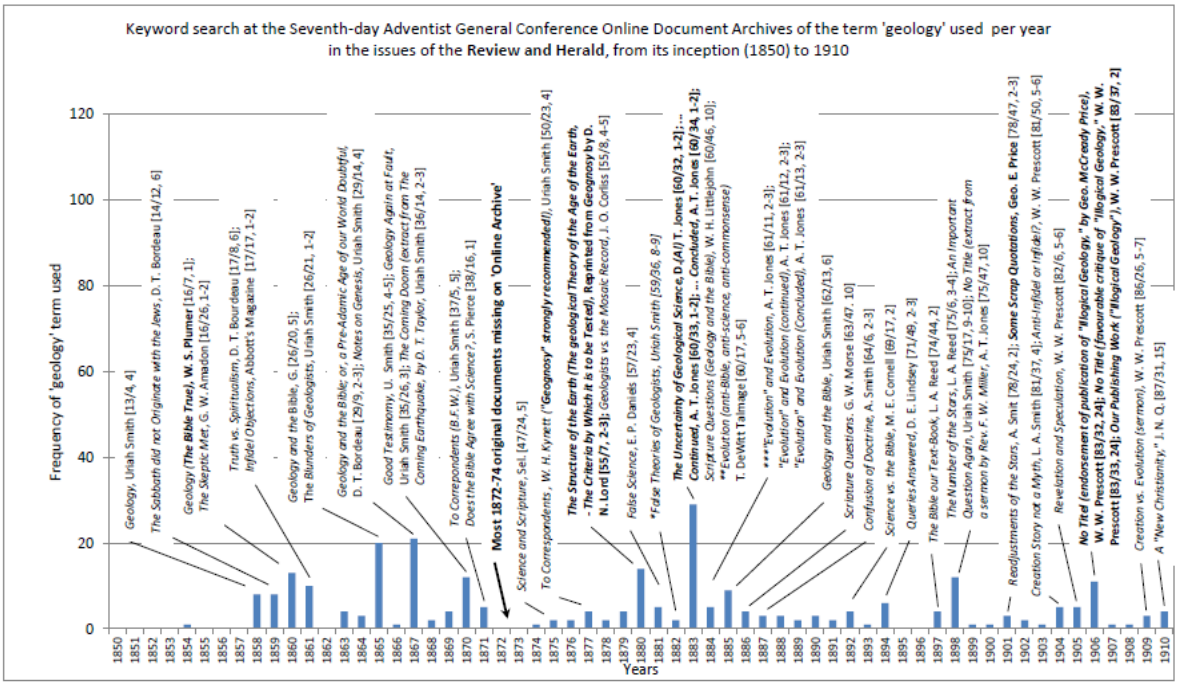


Figure 4.2. Frequency graph of the term 'geology' used per year in the *Review and Herald* between 1850 and 1910. Uriah Smith kept the readers of the magazine regularly informed on the topic of geology and faith. There were clear peaks in the frequency around 1858-61, after 1864, and in the 1880s.

the end of the Civil War volume three of *Spiritual Gifts* was published. 1864 was unquestionably an important marker for the formation of Adventist policy regarding geological and Adventist thought.

The second period contains support for Ellen White's panoramic visions of the Creation days and the Flood. The publication of Ellen White's third volume of *Spiritual Gifts* in 1864 caused a resurgence of articles relating to geology and the Bible from the editor of the *Review and Herald* or one of the Seventh-day Adventist leading elders. In particular, there appeared an increase in the number of articles that pointed to the horrendous effects of earthquakes, volcanoes, and the coming doom before the arrival of the New Jerusalem. A tally for a word search on the *Review and Herald* archive website shows the following tendencies. The word 'volcano' appeared in an issue of the *Review and Herald* about two times per year between 1851 and 1864; after 1864, this doubled to more than four times per year. For the term 'earthquake', the initial frequency was seven issues per year up to 1864.

Between 1865 and 1890 that steeply increased to an occurrence of about nineteen issues per year.[97]

Following 1864, there emerged an even stronger emphasis on the infidel character of this science falsely so-called in the editorials that followed. Also, through the authority attached to her panoramic vision of the Creation days there seemed to be no doubt anymore in the *Review and Herald* articles about the young age of the earth. Much of the material chosen to support the perceptions of the editors continued to come directly from copied biblical commentaries, articles, and books where a contextual introduction was added.

Towards the 1880s, a stronger challenge of scientific geology can be detected in the *Review and Herald* as well as in the newly launched west-coast sister magazine *The Signs of the Times*. The third period (1880 to 1903) saw a more robust response to geology with more in-depth articles, notably, the recognition of the perceived link between geology and evolution. Geology started to be seen as a preferred target to euthanase evolution as a perceived threat.

In 1880, an excerpt of David Lord's 1855 *Geognosy or the Facts and Principles of Geology against Theories* appeared in the *Review and Herald* after similar excerpts had just previously been printed in the denomination's 'rival' paper *The Signs of the Times*. The copied section of David Lord's *Geognosy*, as it appeared in the Adventist periodicals, was debatably the first substantial article that would discuss the merits of geological issues in greater depth. It should however not be forgotten that by that time David Lord's text was already twenty-five years old. What determined the use of David Lord's arguments in the two most important denominational papers at this particular point in time? Was it the publicity that Charles Darwin had created with his *Descent of Man*? Charles Darwin's *On the Origin of Species* had been a more scientific work and difficult to understand for the man in the street. Darwin's first book had not received much response in the *Review and Herald*. The *Descent of Man* definitely created much more publicity with its perceived implications of ape-like ancestors. Alternatively, was it the increasing momentum of the shift of major North American denominations towards accepting a theistic form of evolution? Was it because of an increasing number of geological phenomena that were in the news? For example, the first end to end traverse of the Grand Canyon occurred in 1869 and created much interest in

97. While this increase may be attributed to some extent to the impact of the publication of Ellen White's volume 3 of *Spiritual Gifts*, it should also be realised that simultaneously the *Review and Herald* increased in size. The page numbers doubled, the font size decreased, and the page size increased. This created more space for more diverse articles.

America. Or, could it have been combination of such and other explanations? While during the 1850-75 period geology had been questioned for its *own* merits, during the final quarter of the nineteenth century geology was more and more perceived as an inextricable and necessary precursor to evolution. Questioning the validity of geology now came to be seen as a way of rendering evolution impossible. Rather than tackling the intricate merits of evolutionary thought, geology was chosen to make evolution an impossible proposition.

David Lord's G*eognosy,* with a mid-1850s perspective, written before Darwin's publications, questioned geology's methodology by discussing its perceived circularity of reasoning as well as by exposing the fact that it was not a demonstrative science. Lord's solution was to change scientific geology with its propensity for the use of assumptions and hypotheses, back into a facts-only, cataloguing, 'geognostic' form of geology. Lord's exposé, although outdated, provided Adventist elders with the right ammunition to challenge the nature of geology. It is quite possible that Lord's article inspired Alonzo Jones to investigate the methodology of geology. It is interesting to note, that during more or less the same period Ellen White had encouraged the Adventist ministers to search for the truth themselves rather than always to rely on the work of others.[98]

In the early-1880s, Alonzo Jones took it upon himself, as the first Seventh-day Adventist elder, to investigate the nature of modern geology. For this, he used the latest textbook from a renowned international scholar, Archibald Geikie. Guided by a Baconian common sense distrust in assumptions and theories, he searched the text for flaws and faults in geology's methodology. He became the first Adventist to highlight the perceived connection between geology and evolution (see chapter five). In the process, Jones would come to fulfil a bridging function between the nineteenth century 'theological phase' in questioning modern geology, and the twentieth century 'scientific phase' of developing an alternative Flood geology which was to be spearheaded by George McCready Price (chapter six). Remarkably, shortly before the end of this period, in November 1901, Uriah Smith offered space in the *Review and Herald* to George McCready Price to introduce himself as a novice author on geological thinking within Adventism. The end of Smith's long editorial career and life came unexpectedly on March 6, 1903.

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98. In an address to ministers assembled in the General Conference at Battle Creek, MI, on November 7, 1883, Ellen White said: "Our ministers are failing here . . . We have the truth brought out in publications, but it is not enough to rely upon other men's thoughts." Although Ellen White referred specifically to doctrinal truth, it could easily be extended to the important topic of geology and the Bible. Ellen White, "Unity in Christ," *Review and Herald* 61, no. 10 (March 4, 1884): 146.

4.5 Conclusion

The Baconian common sense philosophical perspective that had appeared so clearly in Smith's doctrinal poems of 1853 would continue to determine Smith's perceptions of geology. Any form of geology that went beyond factual data of rock formations was suspicious to him. Wild guesses, conjectures, assumptions, and theories constructed by the skeptic and unbelieving geologists resulted, according to him, in a 'dreamy' science in its infancy that had no inherent laws. Because of his strong Adventist theological perspective, he saw geology as a science falsely so-called in conflict with a literalist interpretation of Genesis 1. The combination of these two perspectives drove him to warn the *Review and Herald* readers of the dangers of such a science for their faith in God.

Uriah Smith's editorial contributions to the engagement of Geological and Adventist thought were significant because they consolidated and reinforced the thinking of Ellen White as contained in volume three of *Spiritual Gifts.* He supported the *Review and Herald* readers with carefully selected articles that kept them informed about this issue and provided them with answers they needed for their faith. Although Smith did not write any full-scale articles on the topic of geology and Scripture, he put substantial thought into selecting material that matched his views and, he felt, would benefit the Adventist readers. His concise introductions would reiterate earlier expressed views. The opinions that he had so clearly outlined in his 1853 poems remained the same during his half-century connection with the *Review and Herald*. His contributions, therefore, lay more in guiding the issue than in unpacking deeper thoughts on geology.

Because of the small size of the nascent denomination, Adventism did not have a cadre of trained academics that could research the nature of the new science of geology. To address this, Smith looked at the larger and longer established denominations that matched the Adventist theology as much as possible. Smith felt especially at ease with the educated leaders of the Old School Southern Presbyterian Church[99] and their writing on the relationship between geology and Scripture (see fig. 4.3). He also used writings of millennialists to point towards the cataclysmic event that would herald the Second Advent.

Over his almost fifty-year tenure of the editorship of Adventism's main periodical, Uriah Smith responded to a number of important events in Adventism and the world at large.

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99. For science and religion in the Southern Presbyterian Church, see also Monte Harrell Hampton, *Storm of Words: Science, Religion, and Evolution in the Civil War Era* (Alabama: University of Alabama Press, 2014).

The publication of Ellen White's volume three of *Spiritual Gifts* in 1864 was an important event in the history of the Seventh-day Adventist Church. It included an authoritative statement on how to deal with geology and Genesis. Smith responded by choosing articles that aligned with Ellen White's metanarrative and this, in turn, served to increase her authority within the church. Increasing awareness of the impact of the ground-breaking evolution theory on theology during the 1870s resulted in the appearance of articles that questioned the methodology of geology.

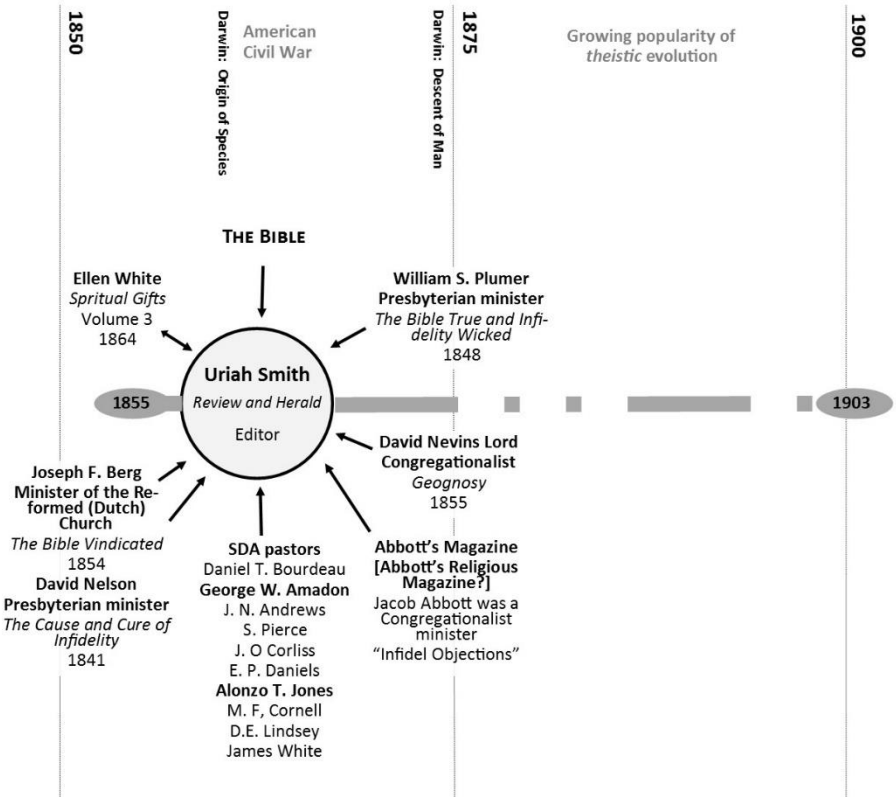


Figure 4.3. Influences on Uriah Smith's geological editorials in the *Review and Herald*, 1855-1903. Smith sought and found articles from other orthodox denominations to fit with the Seventh-day Adventist doctrine. In addition, he published sermons on the topic of geology by Adventist pastors.

Although Smith had the best intentions of guiding the Adventist believers with difficult issues such as geology and Genesis, there arose long-term consequences of biased reporting that would have a ripple effect deep into the future. Geology as a dynamic science would be totally discredited in the magazine. The Adventist readers would continue to receive a prejudiced, derogatory opinion of geologists as inadequate scientists. The reportage lacked any balanced approach to present the scientific aspects of geology that helped, for example, to map the rock formations of the continents of the world, to develop theoretical models to predict and locate valuable resources such as minerals, oil, and groundwater, and to provide explanations for the processes that caused the large-scale geological structures visible

at the surface of the earth. The reporting was completely out of line with contemporary geological thinking. It lacked, for example, any thoughtful articles on the scientific reasons why geologists deviated from a single Baconian approach. The reportage, instead, concentrated on perpetuating the fears that geological thought could be used to contravene a literalist interpretation of Genesis. On the basis of the selective use of secondary literary sources, he helped to formulate an orthodox ecclesiastical response during a time when the Adventist denomination did not have its own theological scholars with an expertise in geology.

Chapter 5

Alonzo Treviér Jones: An Underrated Nexus in the Engagement Process

> If huge mountain masses are lying in a directly inverted position to that of the valleys or the plains, how can we tell which is 'upside down'? And how is the true order of superposition to be settled?
>
> —Alonzo T. Jones, "The Uncertainty of Geological Science" (May 21, 1885)

> As the evidence of fossils is worthless without the true order of the rocks; and as the evidence of the rocks is worthless without the true order of the fossils; then the whole system that is built up on such evidence (?) can be nothing less than worthless. Such is Geological Science.
>
> —Alonzo T. Jones, "The Uncertainty of Geological Science" (May 28, 1885)

> But that geology and evolution are essentially alike, is not all. Evolution is absolutely dependent upon geology. Without geology, evolution can have no place.
>
> —Alonzo T. Jones, "The Uncertainty of Geological Science" (July 2, 1885)

> Geologists have been too generous in allowing other people to make their philosophy for them.
>
> —Herman Le Roy Fairchild, "Geology under the Planetesimal Hypothesis of Earth-Origin"

5.1 Introduction

Alonzo Trévier Jones occupied a significant, though largely unappreciated, place in the interaction between geological and Adventist thought during the final quartile of the nineteenth century. Although his involvement has been fleetingly noted,[1] no in-depth investigation into the geological context and impact of this involvement has been reported. He has, therefore, remained an under-appreciated link between mid-nineteenth century perceptions and the views of the next generation on the response of Adventism to contemporary geology. His contribution followed on from the earliest published perceptions of modern geology in the Adventist periodicals since the mid-1850s, as well as from Ellen White's published panoramic visions of the Creation days and the Flood. Jones' writings preceded George McCready Price's Flood geology by about two decades.

1. Ronald L. Numbers, "Science Falsely So-Called: Evolution and Adventists in the Nineteenth Century," *Journal of the American Scientific Affiliation* 27 (March 1975): 19-20; Ronald L. Numbers, "Sciences of Satanic Origin: Adventist Attitudes Toward Evolutionary Biology and Geology," *Spectrum* 9, no. 4 (January 1979): 19; Ronald L. Numbers, *Darwinism Comes to America* (Cambridge, MA: Harvard University Press, 1998), 95.

His contribution to the engagement process resulted from the reading of the most renowned and up-to-date geological textbook available at the time. Jones studied Archibald Geikie's *1882 Text-Book of Geology* with great zeal. His objective was to evaluate the merits of geological science with respect to the Bible. His findings were published between 1883 and 1885 in both the *Review and Herald* and *The Signs of the Times*, the main Adventist Church periodicals of the time. The aim of this chapter is firstly, to evaluate his contribution and secondly, to determine how Jones' short engagement with geology might link the contributions of the mid-nineteenth century American scriptural geologists and the twentieth century writings of George McCready Price. In addition, this chapter proposes that Jones' geological contribution provided a catalytic nexus in the development of evolutionary thought in the final decades of the nineteenth century.

5.2 A Brief Biography

Alonzo Jones has been characterised as "one of the most controversial Seventh-day Adventists who ever lived."[2] He has been portrayed as "naturally abrupt", some describing "him as having uncouth posturing and gestures, [and to have] singularity of speech and manner."[3] His writing style was often characterised by a measure of bluntness. Besides these negative perceptions, he also received many positive accolades. George Knight, for example, describes him in the period prior to his apostasy as "a powerful leader, preacher, and writer, [who] almost became General Conference president. Then a fatal flaw in his character turned him towards the turn of the century against the church."[4] Ronald Numbers simply characterises Jones as "a self-taught ['geologist'] ex-soldier converted while stationed at Fort Walla Walla, Washington."[5] Alonzo Jones' complex relationship to the charismatic Adventist leader Ellen White was, according to George Knight, one of love and hate. Overall though, she would have a strong supportive influence on Jones' ministry. Knight observes that "she played an important role in encouraging him in his early ministry in the Washington Territory, and was probably instrumental in pointing out his potential to those who called him to the editorial and college teaching fields in 1884."[6]

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2. George R. Knight, *From 1888 to Apostasy: The Case of A. T. Jones* (Hagerstown, MD: Review and Herald, 1987), 21.

3. Ibid.

4. Marlene Steinweg, "A. T. Jones: Editor, Author, Preacher," *Lest We Forget* 7, no. 4 (4th Quarter 1997): 8, 4; George R. Knight, *From 1888 to Apostasy*, front cover.

5. Numbers, "Science Falsely So-Called," 19.

6. Knight, *From 1888 to Apostasy*, 226.

Alonzo Jones was born in Rockhill, Ohio, on April 21, 1850.[7] He enlisted as a private in the United States Army in November 1870 and was stationed on the northwestern frontier. While still enlisted in the army, he was baptised in the Adventist Church in August 1874. When he was eventually discharged from the army at the rank of sergeant in early November 1875, he became tent master and assistant to Elder Isaac van Horn in the campaign of planting new churches at the frontier in Oregon and Washington. The energetic Jones aimed to make rapid progress in the Adventist organisation and in 1878, he was officially ordained as a pastor. In 1880, not long after his ordination, he became the treasurer of the small, new Upper Columbia Conference.

The northwestern frontier received a steady stream of visitors from California: Elder Joseph Waggoner visited in 1876 and 1882; Elder John Loughborough in 1877; Elder Stephen Haskell in 1879 and 1880 and Ellen White visited the region successively in 1878, 1880, and 1884. The frequent visits of the church elders indicated not only the importance of the new frontier area for evangelism and the presentation of the Adventist cause but also their awareness of problems among the missionaries. Soon after Waggoner, editor of *The Signs of the Times*, had recognised Jones' talents, the latter had started to contribute brief administrative reports and articles to the magazine.[8] His first full article, 'published by special request,' was a sermon he had preached in January 1878 at Jefferson, Oregon. Its front-page placement guaranteed immediate exposure for Jones, and the many biblical references in the article reflected his keen interest in Bible study.

Jones had an opportunity to meet up with Ellen White at all three of her camp meeting visits. Already during her first visit in 1878, Ellen White had immediately recognised Jones' talents and considered him a "promising young man" who "calls great congregations and is an acceptable speaker."[9] Prior to Ellen White's last visit, Jones had reiterated his strong desire to go to school in 'the east.' Realising his potential, the Adventist elders were keen to keep the talented Jones at the West Coast. Finally, shortly after her 1884 camp meeting in Walla Walla, Jones was transferred, not as per his request to the east (Battle Creek, Michigan), but to San Francisco, California. On the invitation of editor Joseph Waggoner, Jones began his work at the Pacific Press in early May 1885. Not long after that appointment,

7. Ibid., 16.

8. Alonzo T. Jones, "A Sermon," *Signs of the Times* 4, no. 15 (April 18, 1878): 113, 118.

9. Letters from Ellen White to James White dated June 27 and July 3, 1878.

when Joseph Waggoner was posted to Europe, Jones became a co-editor with Ellet Waggoner of *The Signs of the Times.*

Earlier on, in December 1878, Jones had published two "Historical Notes on the Prophecies."[10] In the articles, he compared prophetic biblical verses with selected evidence from popular history books by eighteenth century historians Charles Rollin (1661-1741) and Edward Gibbon (1737-1794). This exposé further displayed Jones' interest in investigating biblical prophecies and analysing literary sources. This work drew not only attention to his literary skills on the West Coast but was soon noticed further to the east, in Battle Creek, Michigan, home of the *Review and Herald*. In November 1879, a front-page article of one of his sermons preached in Oregon was published in the *Review and Herald*, then Adventism's most influential periodical.[11]

Certainly not timid, in March 1880 Jones tried his hand at a more serious philosophical genre by publishing a brief series of articles comprising a review of the Deist Thomas Paine's *Age of Reason*. Jones set out to show "the many weaknesses and defects" of Paine's book and promised to examine every argument fairly.[12] He went about this exercise by examining selected quotes from *Age of Reason* against his own interpretation of Bible verses. Jones perceived Paine's writing as being explicitly contradictory to the Bible and inherently flawed in its interpretations of the Bible. Towards the end of the review, Jones concludes brusquely that "either Thomas Paine did not understand the Bible, or he falsified the record."[13] Jones would later replicate this *modus operandi* in his review of Archibald Geikie's *Text-Book of Geology* in which he aimed to examine the merits of geology and whether they "would justify a comparison with the Bible."[14] Again, he would use selective quotes in order to expose the flaws of the new science of geology.

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10. Alonzo T. Jones, "Historical Notes on the Prophecies," *Signs of the Times* 4, no. 47 (December 12, 1878): 370-1; Alonzo Jones, "Historical Notes on the Prophecies. (Concluded)," *Signs of the Times*, 4, no. 48 (December 19, 1878): 378-9.

11. Knight, *From 1888 to Apostasy*, 21. This happened five years earlier than suggested by George R. Knight, who stated that Jones' first article was published in January 1884.

12. Alonzo T. Jones, "A Review of Paine's 'Age of Reason'," *Review and Herald* 55, no.13 (March 25, 1880): 195.

13. Jones, "A Review of Paine's 'Age of Reason,'" 195-6; Alonzo T. Jones, "A Review of Paine's 'Age of Reason.' (Continued.),'" *Review and Herald* 55, no. 14 (April 1, 1880): 211-2; Alonzo T. Jones, "A Review of Paine's 'Age of Reason.' (Continued.)," *Review and Herald* 55, no. 15 (April 8, 1880): 226-7; Alonzo T. Jones, "A Review of Paine's 'Age of Reason.' (Concluded.)," *Review and Herald* 55, no. 16 (April 15, 1880): 244-5.

14. Alonzo T. Jones, "The Uncertainty of Geological Science," *Signs of the Times* 11, no. 19 (May 14, 1885): 292.

His published articles of a historical nature were generally based on popular secondary sources such as the New York *Independent*, *Encyclopaedia Britannica*, Horne's *Introduction to Critical Study and Knowledge of the Holy Scripture* and Gibbon's *Decline and Fall*. Jones impressed the church elders in Battle Creek so much with his skills of historical research that in 1884 the General Conference session commissioned him to write a series of articles describing the fulfilment of prophecy based on historical evidence.[15] After 1885, this topic would bring him into serious conflict with Elder Uriah Smith, the *Review and Herald* editor and author of a long-time Adventist classic, *Thoughts on Daniel and the Revelation.*[16] Jones was totally committed to the Adventist cause and from early 1887, in addition to his other duties, *also* pastored the Healdsburg Adventist church.[17] Within just over ten years of his baptism, Jones had managed to make nothing less than a meteoric rise in the West Coast Adventist hierarchy.

5.3 Jones' Position in the Geology-Adventism Engagement

It is curious that not a single reference to Alonzo Jones' contribution to the engagement between geological and Adventist thought appears in any of the biographies of Jones.[18] His writings relating to geology were probably not considered significant in relation to his other contributions to Adventism. Yet, as we will see, he was the first Adventist elder who, upon perusal of an academic textbook, called into question the scientific nature of geology and highlighted an important, perceived flaw in the theory of superposition of rock strata, which would become one of the main arguments of McCready Price's crusade against 'evolutionary' geology. The 'uncertainty' of geological science became the central tenet of Jones' articles. Possibly, Jones was inspired by Ellen White's contention that geologists who leave the word of God "are upon a boundless ocean of uncertainty."[19] Jones set out to expose once and for all the uncertainty of geological science. He would argue, in a similar vein to the

15. George R. Knight, *Angry Saints. Tensions and Possibilities in the Adventist Struggle over Righteousness by Faith* (Hagerstown, MD: Review and Herald, 1989): 19.

16. Knight, *From 1888 to Apostasy,* 22.

17. Ibid.

18. Knight, *From 1888 to Apostasy*; George R. Knight, *Angry Saints*; George R. Knight, *A. T. Jones: Point Man on Adventism's Charismatic Frontier* (Hagerstown, MD: Review and Herald, 2011).

19. Ellen G. White, *Spiritual Gifts*, vol. 3 (Battle Creek, MI: Seventh-day Adventist, 1864), 93.

mid-century scriptural geologist David Lord, that geology is not a real, demonstrative science but a "sham science," full of uncertainty.[20]

5.3.1 Contributions from Farmington, Washington Territory

It was while he was still stationed as a missionary at the hamlet of Farmington, Washington Territory, that Jones penned his first version of a series of articles on the uncertainty of the science of geology. This was based on Geikie's *Text-Book of Geology*. On August 7, 14, and 21, 1883 he published three articles in the *Review and Herald* (see Table 5.1). As he would state later in an updated version of this study in the 1885 *The Signs of the Times*, his aim had been "to examine geological science on its own merits."[21] He wanted to assess the ideas on which it was based, and to see whether "it has any merit that would justify a comparison with the Bible."[22] However, on reflection, it is not difficult to see that Jones approached the study of Archibald Geikie's *Text-Book of Geology* in a far from objective fashion. He assessed geology from a perspective of skepticism and with an expectation of discovering contradictions, flaws, and errors.[23] By the time Jones' revised version of the articles started to appear in *The Signs of the Times,* he had just become the co-editor of the magazine.

5.4 Archibald Geikie's *Text-Book of Geology* (1882)[24]

Scottish geologist, Sir Archibald Geikie (1835-1924), was already a highly esteemed and established author of scientific books on geology by the time that his *Text-Book* reached the shelves (see fig. 5.1). He was an active field geologist and eventually became Director of the Scottish Geological Survey. In December 1870, he became Professor of Geology and Mineralogy at the University of Edinburgh and in that position, he managed to travel extensively throughout Europe and western America. In 1881, he subsequently became Director-General of the Geological Survey of the entire United Kingdom.[25] He developed into a well-respected authority in the field of geology and wrote many scholarly texts on both

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20. David N. Lord, *Geognosy or the Facts and Principles of Geology against Theories* (New York: Franklin Knight, 1857), 59; Alonzo T. Jones, " 'Evolution' and Evolution," *Signs of the Times*, 11, no. 26, 404.

21. Jones, "The Uncertainty of Geological Science," *Signs of the Times*, 292.

22. Ibid.

23. Francis D. Nichol (editor) made this observation in *The Seventh-day Adventist Bible Commentary: The Holy Bible with Exegetical and Expository Comment,* Commentary Reference Series, vol. 1 (Washington, D.C.: Review and Herald, 1978), 73.

24. Archibald Geikie, *Text-Book of Geology* (London: MacMillan, 1882).

25. "Sketch of Sir Archibald Geikie," *Popular Science Monthly* 43 (June 1893): 258.

Table 5.1. Significant differences between the versions of Alonzo Jones' Geology and Evolution articles in respectively the Review and Herald (1883 and 1884) and The Signs of the Times (1885)

***Review and Herald* (1883-4)**	***The Signs of the Times* (1885)**
Coding used: **RH = *Review and Herald*; ST = *The Signs of the Times*** **USG1 = "Uncertainty of Geology" article 1; EE1 = " 'Evolution' and Evolution" article 1**	
August 1883 A series of **three** articles on The Uncertainty of Geological Science (RH-UGS): RH-UGS1 (August 7, 1883) RH-UGS2 (August 14, 1883) RH-UGS3 (August 21, 1883) • Concluding remarks quoting Darwin from *Descent of Man*, "The high antiquity of man . . . is the indispensable basis for understanding his origin." This would not appear at the end of ST-UGS4 anymore but was instead moved to the final section of ST-EE4. RH (August 28, 1883) Is Evolution Science? • This entire article would be inserted at the beginning of ST-EE4. **March 1884** A series of **three** articles on "Evolution" and Evolution (RH-EE): RH-EE1 (March 11, 1884) RH-EE2 (March 18, 1884) RH-EE3 (March 25, 1884)	**May and June 1885** A series of **four** articles on (The) Uncertainty of Geological Science (ST-UGS): ST-UGS1 (May 14, 1885) • At the start a proposition was inserted 'to examine geological science on its own merits' and whether it 'would justify a comparison with the Bible.' In the conclusion of ST-UGS4 Jones came back to this proposition and felt justified to conclude that "the only certain thing about it is its UNCERTAINTY." • Paragraph inserted to discuss the missing 'chapters and books' of the stratigraphic record and the uncertainty of the interpretations of the remaining parts. ST-UGS2 (May 21, 1885) • Parallel statements inserted to show that the apparent superposition of 'completely overturned' rock beds is 'deceptive.' ST-UGS3 (May 28, 1885) • A rewritten paragraph was expanded after parallel quotations that showed a perceived 'geological circle.' Jones concluded: if "the evidence of fossils is worthless without the true order of rocks; and as the evidence of rocks is worthless without the true order of the fossils; then the whole system . . . can be nothing less than worthless." • An extended section was added at the end of the article on the "facts" of M. Barrande's perceived migrations of Silurian fauna (colonies) of Bohemia which upset the "generalisations" of geology. Jones also lamented that between 1852 and 1882 "every form of the cataclysmal [the deluge] scheme of geological progression has been discredited." ST-UGS4 (June 4, 1885) • Four brief paragraphs have been inserted and a synopsis of the uncertainty of geological science was added at the end. • The first two added paragraphs dealt with the confusion created by "the facts" of Barrande's "doctrine of Colonies." • Jones noted that the limit of the Silurian system was fixed by evidence of fossils *before* the succession of strata was accurately determined (contrary to what geologists claimed to be so important). • Jones mentioned the proportional uncertainties created by occurrences of stratigraphic gaps over increasing geographical distances. • A synopsis of the uncertainty of geological science was added in conclusion. Critical points of uncertainty 5, 6, and 7 are of a stratigraphical nature. **June and July 1885** A series of **four** articles on "Evolution" and Evolution (ST-EE) appeared: ST-EE1 (June 11, 1885) ST-EE2 (June 18, 1885) ST-EE3 (June 25, 1885) ST-EE4 (July 2, 1885) • The previously separate *Review and Herald* article of August 28, 1883, 'Is Evolution Science?' was now inserted here in two sections. The first section quoted material from the New York *Independent* of May 27, 1880 to state that the "so-called science" of evolution is "sham science." Jones then added a comparison of the above with Geikie's geology to suggest that geology is also "sham science." The second section made a swipe at Geikie's "working hypothesis as earlier introduced in RH-UGS1 and ST-UGS1. • Jones concluded by stating that geological science undermined the "*first chapter of Genesis,"* and that it formed the "indispensable basis" for evolution which undermined "*the whole Bible*."

geology and physical geography. Because he wrote more widely on general matters of geology than any of his peers, his writing was considered "representative of what the British geological community thought . . . in the second half of the nineteenth century."[26] His *Text-Book of Geology* proved exceptionally popular and went through four editions (1882, 1885,

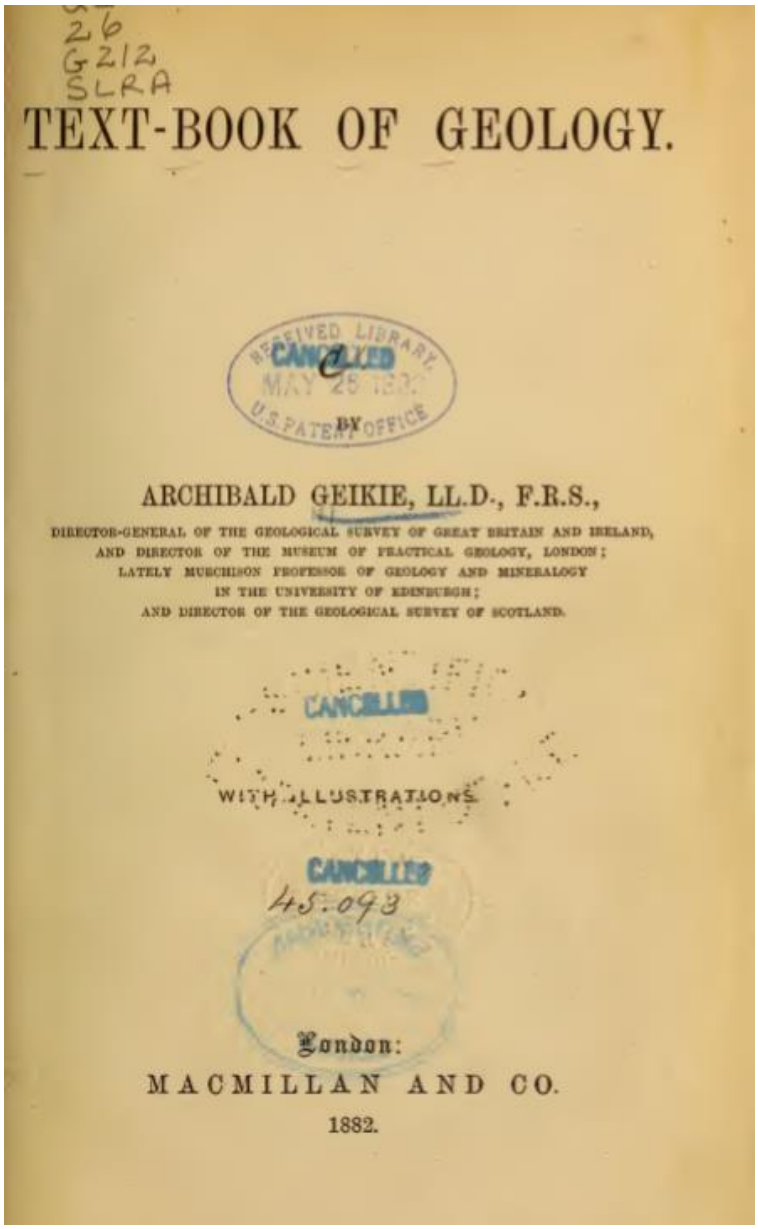


Figure 5.1. Title page of Archibald Geikie's *Text-Book of Geology* (1882).

26 David R. Oldroyd, *The Highlands Controversy: Constructing Geological Knowledge through Fieldwork in Nineteenth-century Britain* (Chicago: University of Chicago Press, 1990), 337.

1893, 1902).[27] Geikie's view of geology had substantial social significance because it "influenced professionals as well as amateurs" at a semi-popular level.[28] His philosophical approach to the science was that of a conservative inductivist and empiricist who shied away from unwarranted theories in geology. He was strongly influenced by the ideas and methods of fellow Scotsman James Hutton, who had promoted the method of using the present earth surface landforms and processes as a key to understanding the geological past. It is little known that it was Geikie who coined the phrase, "The present is the key to the past."[29] It should be realised that Geikie saw this maxim not in absolute terms but rather as a 'working hypothesis' to be tested and refined by observation through geological field-based research. In the introduction of his *Text-Book,* he made a clear *proviso* for potential differences between the conditions of the present geological epoch and the entire geological history.

5.4.1 A Perspective of Experienced Field Geologists

Before analysing Alonzo Jones' perusal of the *Text-Book,* it is interesting to see how Geikie's peers in the professional global geological community valued the book. Grove Karl Gilbert (1843-1918) provided an American perception of the textbook.[30] During the 1880s, Gilbert was regarded as one of the best known and most experienced American field geologists and was a strong proponent of the use of hypotheses as the driving force in knowledge accumulation in geological investigations. Gilbert especially *encouraged* the testing of multiple working hypotheses as the preferred method of theory building in the new science of geology. In his professional articles, Gilbert would urge geologists to weigh various hypotheses and reason which one deserved to be the most favoured in the situation.[31]

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27. The *Text-Book* contains in total 928 pages of text with an additional 42 index pages and is divided into seven major subdivisions (which Geikie named 'Books'): Book I. Cosmical aspects of geology (the movements of the earth in their geological relations), Book II. Geognosy (investigation of the materials of the earth), Book III. Dynamical geology (geological processes beneath and on the earth's surface), Book IV. Geotectonic/ structural geology (architecture of the earth crust), Book V. Palaeontological geology (organic remains/fossils), Book VI. Stratigraphical geology (organisation of rock strata/layers), Book VII. Physiographical geology (landscape features due to disturbance of the crust).

Jones changed the term 'Book' into 'Part' in his articles (without mentioning). This is highly confusing since Geikie used the same term 'Part' for further subdivisions of his 'Books.' Following Jones' quoted text fragments from Geikie's original book is a time consuming exercise. The quotes are not always verbatim.

28. Oldroyd, *The Highlands Controversy*, 337-8.

29. Geikie used the phrase on page three of his *Text-Book* and it also appeared in: Archibald Geikie, *The Founders of Geology* (Baltimore: Johns Hopkins Press, 1901), 168.

30. G. K. Gilbert, "Geikie's Geology," *Nature* 27, no. 689 (January 11, 1883): 237-9; G. K. Gilbert, "Geikie's Geology II," *Nature* 27, no. 690 (January 18, 1883): 261-3.

31. See for example: G. K. Gilbert, "The Inculcation of Scientific Method by Example, with an Illustration drawn from the Quaternary Geology of Utah," *American Journal of Science,* 3rd Series, 31, no. 184

Shortly after its release in North America in January 1883, he reviewed the *Text-Book* for *Nature*. His review appeared eight months before Jones' series of articles on the 'uncertain nature' of the science of geology in the *Review and Herald*. Although Jones referred in his first article to the New York *Independent*'s high praise of Geikie's skills as an author and as a scientist-educator, he did not refer to Gilbert's review in *Nature*.

In his review Gilbert stated that he would evaluate Geikie's *Text-Book of Geology* as a reference book for students and as a key to the future science of geology.[32] He scrutinised the book on its scope, the arrangement of subject matter, the quality of its treatments, and the clarity of presentation. Gilbert noted that the bulk of the book was devoted to geognosy (the rocks of the earth crust), dynamical geology (the processes whereby the rocks originate), and structural geology (the larger structures of the rock masses). The *Text-Book* gave more than ample attention (about a third of its volume) to detailed stratigraphical characteristics of rock strata and important type localities where the rocks have primarily been studied. Gilbert commented that geology textbooks had not yet been clearly differentiated from working geologists handbooks. He, therefore, wondered whether the voluminous 275 pages dedicated to descriptive stratigraphy could perhaps have been written with such a geologist's manual in mind. Gilbert remarked that this present large stratigraphical chapter with its massive detail would surely bewilder any student who tried to master it. According to him, a chapter reduced from 275 to about 50 pages would have been more suitable for novices.[33] Gilbert, in the end, valued the textbook as, "broad, and catholic, conscientious in detail, [and] masterly in treatment."[34]

University of Birmingham (UK) Geology Professor, Charles Lapworth, who reviewed the *Text-Book* early in 1883 for the British *Geological Magazine*, equally thought that the work came close to being a geologist's handbook but still remained the "most readable and complete work upon the entire subject yet issued to the public."[35] With reference to the present condition and needs of the science, Lapworth praised the general plan of the book. He

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(April, 1886): 284-99; G. K. Gilbert, "The Origin of Hypotheses, illustrated by the Discussion of a Topographic Problem," *Science* N. S., 3, no. 53 (January 3, 1896): 1-13. Gilbert was indebted to fellow geologist Thomas C. Chamberlin for "multiple working hypotheses." Gilbert cites Chamberlin, "The Method of Multiple Working Hypotheses," *Science* 15 (1890): 1.

32. Gilbert, "Geikie's Geology," 237.

33. Gilbert, "Geikie's Geology," 238.

34. Gilbert, "Geikie's Geology II," 262.

35. Charles Lapworth, "Reviews – Dr. A. Geikie's *Text-Book of Geology*," *Geological Magazine* 10, no. 2 (February 1883): 84.

thought its selection of material and the balancing of its parts represented commendably well the views generally entertained by the community of geologists at large. He identified some weak points such as, for example, the brevity of reference to the antiquity of man but overall greatly praised the book. It is interesting to note that he was especially impressed with the 'scientific modesty' displayed by the author, "by treating every conclusion as a hypothesis, to be tested by future researches, and possibly [to be] amended or even abandoned."[36] Both Gilbert and Lapworth were recognised authorities in the global community of professional geologists and both of them, like Archibald Geikie himself, ultimately received the highly esteemed scientific Wollaston Medal of the Geological Society of London for their contributions to the science of geology.[37]

5.4.2 The Context of Jones' Evaluation of Geology

It is within this context of positive accolades from international peer reviewers that Jones' assessment of geology appears. Following the influential New York *Independent*, Jones introduced Geikie's *Text-Book* as "the latest, the ablest, and the best contribution in favour of geological science as it is at the present day."[38] Jones could have chosen a number of available textbooks written by excellent American geologists but does not specify the reason for his particular preference for this British textbook other than that this was the latest textbook highly applauded by the critics.

Jones assessed the emerging science of geology from an entirely different set of perspectives to those used by the professional reviewers of Geikie's textbook. Jones' articles were, after all, written for conservative Adventist Church journals. The journals were strongly influenced by Ellen White's charismatic personality, her prophetic metanarrative, the adherence to strict inductive Baconianism, a common sense philosophy, and a definite antipathy towards the wider acceptance of modern geology and theistic evolution. The intended audience was non-scientific and looked forward to confirmation of their Adventist faith. For many readers, the journals were their most important source of spiritual nourishment and the closest contact they had with their church. Jones' intention was undoubtedly to strengthen the faith of the believers within the framework of the Adventist doctrines. Without any prior geological training or any other form of tertiary education but

36. Ibid.

37. Archibald Geikie received the Wollaston Medal in 1895, Lapworth in 1899, and Gilbert in 1900.

38. Jones, "The Uncertainty of Geological Science," *Signs of the Times*, 292. The textbook was hot off the press in 1883 and certainly has the allure of an excellent textbook at this time.

guided by common sense, Jones felt confident to analyse the reasoning and methodology of the complex science of geology. He wrote the articles while still domiciled at the remote northwestern frontier before becoming part of the editorial team of the journals.

From the time of his release from frontier evangelistic duty shortly after the 1884 Washington Territory camp meeting in Walla Walla (5-16 June, 1884) until the start of his editorial duties with *The Signs of the Times* in early May 1885, Jones and his family had had time to settle in and prepare for their new duties.[39] It appears that Jones had used some of that interval to edit his 1883 and 1884 contributions on geology (RH-UGS) and evolution (RH-EE)[40] in the *Review and Herald* and into a more cohesive set of articles with added paragraphs to strengthen his arguments. On May 7, 1885, Jones had become co-editor of *The Signs of the Times*. Scarcely a week after the first appearance of his name as part of the editorial staff of *The Signs of the Times*, the first episode of his eight-part sequence of articles on the topics of geology and evolution (ST-UGS directly followed by ST-EE) appeared. The fused collection of articles in *The Signs of the Times* can be regarded as the first attempt at a cohesive assessment of geological theory and methodology, as well as its relationship to evolution, by an elder of the Adventist Church.

5.4.3 The Timing of the Publication of Jones' Series of Articles on Geology and Evolution

The timing of this series of articles in *The Signs of the Times* was certainly not a random occurrence. His articles seemed to be part of an unfolding strategy on the part of Adventist elders to counter the thorny topics of geology, Darwinism, and evolution. While the Adventist editors had never explicitly dealt with the impact of Charles Darwin's 1859 publication of *On the Origin of Species*, his next, more imaginative publication, *The Descent of Man* in 1871, would get a more overt reaction. Darwin's book launch coincided with the growing popularity of theistic evolution. Several of the larger American church denominations had adopted a harmonising approach between evolution and the Bible, whereby they saw God as the Creator who had provided the Earth with developmental processes. Both stimuli; the appearance of *The Descent of Man* and the growing popularity of theistic evolution; prompted the Adventist church elders to react.

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39. *The Signs of the Times* for July 17, 1884 reported his move from the Northwest frontier.

40. RH-UGS denotes the first group of articles on the uncertainty of geological science and RH-EE is a code used for the second batch of articles titled, " 'Evolution' and Evolution" in the *Review and Herald* (see Table 5.1).

Starting in March 1879, several chapters of Ellen White's metanarrative *The Great Controversy* had been published in *The Signs of the Times.* The chapters were edited versions of earlier chapters of her 1864 *Spiritual Gifts*. On March 13, 1879, chapter seven of *The Great Controversy* entitled, 'The Flood', was republished as Ellen White's eyewitness account of the effects of the Genesis Flood. Ellen White predicted that ignition of the coal layers formed at the Flood would lead to mighty convulsions with earthquakes and volcanic activity shortly before the Second Advent of Christ. The next week saw the publication of chapter eight, "Disguised Infidelity," in which the infidel suppositions of geologists who assumed an old earth of much greater age than the first appearance of man were criticised. Ellen White considered this irreconcilable with the literal interpretation of seven 24-hour days of Creation and the scriptural foundation of the Sabbath of the fourth commandment. The reworked chapters that had first appeared in her 1864 third volume of *Spiritual Gifts* appeared this time without the familiar statements, "I was then carried back to the creation, and was shown that," and "I have been shown that." The re-publication in *The Signs of the Times* was no doubt meant to reconfirm for the Adventist believers that the factual data from the Bible were more trustworthy than the mere assumptions of infidel geologists.

It can hardly be coincidental that from 1 May 1879 onwards, Ellen White's writings published in *The Signs of the Times* were followed up with three articles copied from the first chapters of scriptural geologist David Lord's 1855 *Geognosy or the Facts and Principles of Geology against Theories*. Lord had written this book to point out from a strict Baconian perspective the unscientific nature of the new science of geology; how it was based on false principles and that, instead, the *facts* of geology vindicated the Genesis narrative of the Scriptures. A quarter of a century after its first appearance, Waggoner, the editor of *The Signs of the Times*, carefully selected the book's beginning 'philosophical' chapters to be reprinted in the journal. In the first reprinted section, Lord set out the objective of the narrative: "The geological doctrine deserves . . . to be carefully tested, that if mistaken, and unscientific, the false principle on which it proceeds may be pointed out, and the Scriptures [be] vindicated from the objections of which it is the source; … ."[41] Lord quickly suggested that the new geology should be curtailed by refraining from making unsubstantiated hypotheses. Instead, geology should rather remain a purely factual descriptive study, and merely "present a minute and accurate description of the elements of which the crust of the earth is composed."[42]

41. David Lord, *Geognosy*, 15.

42. Ibid., 60.

In line with the current popular common sense philosophy, Lord voiced that it was not the prerogative of the "professed geologists" alone to discuss their theories. On the contrary, he was strongly convinced that such a matter was "entirely within [the] sphere of reasoners" and it was therefore "within the proper province of the sacred interpreter and theologian to ascertain . . . whether the dogmas of geology contravene or not [the record in Genesis]."[43] For example, on the question of the age of the geological strata he forcefully voiced his opinion that the age "is not to be ascertained by the hammer or the pickaxe, by chemical analysis, by touch, or by inspection," because the chronology of the rock is "wrought by the finger of the Almighty."[44]

On the validity of the manner of reasoning used in geology, Lord strongly hinted at the occurrence of circular reasoning. He pointed out that inferring the age of the world on the hypothesis that the rock strata were formed at the same rate as they are disintegrating now, "is to beg at the outset, the very point which they affect to prove."[45] He further argued that the determinations of the age of the earth based on the hypothesis concerning the processes of the formation of rock strata is a logical fallacy; Lord reasoned that if one removes that hypothesis the inference becomes a *non-sequitur*.[46]

Lord especially criticised geology's abundant use of assumptions and hypotheses as part of their theory-building process and considered this method completely unscientific. He had, for example, forcefully asserted that, "to build an inference of the age of the world on [the assumption that there was originally no lack of combustible matter in the earth for the fusion of all its substances, is] to build it on a hypothesis of what cannot be shown to have been a fact; and that it is to build it on nothing, and render it wholly unscientific and worthless."[47] Convinced of the harmony between God's Word and His Works, David Lord stated that geologists cannot rationally argue that based on "mere assumptions, vague hopes, or undefined impressions" there is no harmony between God's Word and His Works.[48] For him the facts of the Bible were without any doubt more trustworthy than the assumptions and

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43. David N. Lord, "False Notions of Geology," *Signs of the Times* 5, no. 21 (May 22, 1879): 163.

44. Ibid.

45. David N. Lord, "The Geological Theory of the Age of the Earth Examined," *Signs of the Times* 5, no. 18 (May 1, 1879): 139.

46. David Lord, "False Notions of Geology," 163.

47. David Lord, "The Geological Theory of the Age of the Earth Examined," 139.

48. David N. Lord, "The Geological Theory Contradictory to the Sacred History," *Signs of the Times* 5, no. 19 (May 8, 1879): 147.

hypotheses of the geologists. According to David Lord, geology is not a demonstrative science that can deduce a set of general laws that apply specifically to this science and it should therefore not be allowed to expand beyond the limits of geognosy.

Barely a few weeks later, on July 29, 1880, Waggoner, the editor of *The Signs of the Times*, selected an article from the New York *Independent* of May 27, 1880 with the title, 'Is Evolution Science?' for publication. A brief explanatory endorsement note entitled, 'Exact Science,' followed at the end of the periodical as an indication of the importance given to the article. The *Independent* article had been authored by D. S. Gregory, President of the Michigan Presbyterian Lake Forest University. With reference to evolution, Gregory had set out to answer the question of scientific truth: "Is evolution true, or is it false [science]?" If evolution as a science is *not* the result of a consistent logical construction and is proven 'false,' he thought, it should be treated accordingly. He therefore checked evolution against 'correct' inductive sciences, which should, according to him, possess the following features: an exact observation of facts, a correct interpretation of such facts, and a consistent logical contruction of the results of the interpreted facts into a scientific system. He observed that evolution had no solid base of observed facts, did not correctly interpret the adduced facts, and that it assumed, rather than investigated or proved the facts. Gregory concludes, with a typical Baconian perspective of science, that evolution was a false, "sham science," or, "science so-called" which was "not the product of the consistent logical embodiment of the results of observation and rational explanation of facts."[49] Jones, in the concluding article of his geology and evolution series, would on more than one occasion quote Gregory's forceful phrase, "Let us have real science, and not sham science" and would close with Gregory's observation that "geology and evolution are [in nature] essentially alike."[50]

It is interesting to note that Uriah Smith, the editor of the *Review and Herald*, "heartily" endorsed and copied in "his" church paper the same "excellent" *Independent* article on August 19, 1880 with reference to its recent appearance in *The Signs of the Times*.[51] Both senior resident editors as well as Alonzo Jones clearly advocated Baconianism as the only acceptable method of doing science. Their strict Baconian perspective justified

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49. D. S. Gregory, "Is Evolution Science?" *Signs of The Times* 6, no. (July 29, 1880): 339; D. S. Gregory, "Is Evolution Science?" *Independent* 32 (May 27, 1880): 2.

50. Jones, " 'Evolution' and Evolution," *Signs of the Times*, 404; D. S. Gregory, "Is Evolution Science?" *Independent* 32 (May 27, 1880): 2.

51. "Is Evolution Science?", 132.

their denunciation of geology and evolution as a potential challenge to their literal interpretaion of the Genesis narrative.

Jones' series of articles appeared within this context. Remarkably, there is no evidence of any personal interest of Jones in geology before or after his series of articles in the Adventist periodicals. The astute Jones seems to have managed with typical commonsensical confidence to familiarise himself extremely quickly with geology's general scope.[52] As earlier noted, his main source for geological wisdom was Geikie's 1882 *Text-Book of Geology* which had only recently (in the second half of 1882) been published in England. The American version was only published early in 1883. As early as August 7, 14, and 21, 1883, Jones' articles appeared in the *Review and Herald*. Jones showed a keenness to familiarise himself with new knowledge. He mentioned that he had read and studied Geikie's textbook three times before he wrote the articles. Realising the sheer size of the book (nearly a thousand pages) and its rather technical language, that was no small achievement. The timing indicates that Jones wrote the geology articles for the *Review and Herald* whilst still living at the northwestern frontier in remote rural Farmington, Washington Territory.

What prompted Jones to write on this topic? Was he invited to write on this topic for the *Review and Herald* or *The Signs of the Times?* Is it possible that the *Review and Herald* editor, Uriah Smith actually commissioned Jones to peruse Geikie's *Text-Book* for anticipated weaknesses in the science of geology? The fact that Jones got hold of this brand-new textbook in such a remote frontier location a few months after its first appearance poses some interesting questions. Did the publisher send a copy of the book to the Adventist media for a review article? Did the book reach Jones by rail from eastern America via *Review and Herald* editor Smith? Smith's first contribution on geology back in 1858 in the *Review and Herald* had contained a lengthy quote on the contradictory and uncertain nature of geology: *"There is not a geological theory extant which would not be overthrown, and the whole science revolutionised by the discovery of a single new fact."*[53] It is certainly noteworthy that the gist of this italicised sentence can be found back in the covering title of Jones' four geological

52. George Knight makes no reference at all to geology in AT Jones' biographies. However, Ronald Numbers briefly introduces Alonzo T. Jones as a self-taught ex-soldier who was probably the best informed Adventist of his day to comment on geology because he seriously perused Archibald Geikie's authoritative *Text Book of Geology*. The main result of Jones' study of Geikie's *Text-Book* was to convince himself of the uncertainty of geology and its use of circular arguments (Numbers, *Darwinism Comes to America*, 95).

53. Uriah Smith, "Geology," *Review and Herald* 13, no. 4 (December 16, 1858): 28. Italics as in Smith's editorial.

contributions, 'The Uncertainty of Geological Science'. Very little of the early correspondence between Smith and Jones has unfortunately survived the ravages of time.

Alternatively, did Geikie's book land on the West Coast, coming to the attention of Joseph Waggoner who prompted Jones? Waggoner had been the first Adventist editor to select sections of David Lord's *Geognosy* for publication. He had visited Jones in Washington Territory at least twice (1876 and 1882) before Jones wrote the articles. Waggoner, as *The Signs of the Times* editor, certainly appeared proactive in steering Adventism's reaction to the challenges of modern geology and evolution. Not only had he been the first editor to revive attention to David Lord's *Geognosy* but he also was the first editor of the Adventist journals to use Gregory's assessment of evolution after it had appeared in the New York *Independent*. It is therefore quite possible that Waggoner was instrumental in so expeditiously forwarding Geikie's *Text Book* to Jones and encouraging him to evaluate the *science* of geology.

5.5 Jones' Analysis of the New Hypothetical Sciences

It is important to note that Jones had no perception of what it 'felt' like to be a (field) geologist. Practising geologists had gained a highly specialised practical skill set in order to deal with the subtleties and complexity of contextualising rock strata within a multi-dimensional framework. This complex framework included the temporal theoretical scaffold of the geological history of the earth and the three dimensional spatial aspects of strata as displayed on geological maps. Without such hard-earned skills and experiences, it is virtually impossible to evaluate objectively the nature and methodology of the practical science of geology. It is important to note that when Jones wrote the article series, it had not yet been very widely articulated that geology, especially in its theoretical reasoning, was unlike any other science. However, a perusal of contemporary American geological reports would have provided access to the discussion of geology's methodology. Jones, though, based his examination of geology solely on Geikie's textbook and used his trusted Baconian inductive perspective with unlimited confidence in plain common sense.

5.5.1 His Evaluation of Geology

Although Jones' two series of articles on geology and evolution [RH-UGS and RH-EE] had earlier in 1883 and 1884 been published in the *Review and Herald* (see Appendix A), specific attention is given here to their 1885 republication in *The Signs of the Times* (see Appendix B). Their republication is of special interest because, firstly, Jones' editorial reworking made them into one cohesive argument and, secondly, because of the manner in

which the articles on geology fitted into the sequence of articles in *The Signs of the Times* that had started in March 1879 with Ellen White's reprinted sections of *Spiritual Gifts* (see Appendix B).

The purpose of the articles was, according to Jones, to examine geological science on its own merits and to assess whether those merits justify a comparison with the Bible.[54] Jones wanted to evaluate whether geology was a true science worthy of comparison with Scripture. For this examination of the merits of geological science, Jones selected a number of specific aspects from Geikie's textbook to highlight the uncertain nature of the science. In the articles he 'exposed' geology's foundation on mere assumptions and hypotheses; the weaknesses in determining the age of the earth; geology's uncertain stratigraphy; its dependence on circular reasoning; and its total lack of potential scientific demonstration. His eight-article geology and evolution narrative takes on the shape of a montage of lengthy quotes interconnected with brief comments. With his copious quotation, it is sometimes difficult to make a clear distinction between the voice of the quoted authors and Jones' own commentary.

Too Many Assumptions and Hypotheses

With his Baconian perspective of the sciences, Jones struggled with the growing hypothetic nature of theory building in geological science. In a similar fashion to the approach taken by David Lord in his first chapter of *Geognosy*, Jones started with exposing the frequent use of terms that indicate the hypothetic nature of geology's developing scientific methodology. Lord had equally showed his dislike for the hypothetic terminology, and over-emphasised the terms *inference*, *theory*, *hypothesis*, *assume*, *assumption*, *supposition*, and *speculation*. All through the first episode of his article series, Jones tauntingly printed in italics and/or in quotation marks terms that expressed a lack of firmness or absoluteness. Geikie had clearly used the terms to convey an appropriate scientific modesty because of the ongoing, investigative nature of geology. In contrast, Jones wrote sarcastically when referring to such statements in Geikie's textbook; "we may *assume* the uniformity of action, and use the *assumption* as a *working hypothesis.*"[55]

He frequently showed his negativity by craftily collating a number of phrases into sentences to highlight the assumptions that geologists make to determine the sequence of events that are recognised in the geological history of the earth. He ridiculed the scientific

54. Jones, "The Uncertainty of Geological Science," *Signs of the Times*, 292.

55. Ibid.

modesty of geologists with the following construction: " 'the foundation of the geologist's training' is an 'assumption'; and this assumption must not be allowed a 'firm footing' because it may blind us to an *obvious truth*, and because it also may be '*entirely erroneous'.*"[56] Where Geikie referred to gaps in the Geological Record due to erosive episodes or local non-deposition, this imperfection of the record led Jones to observe:

> there are not only 'whole chapters and books' missing, but [the geologists] are not sure that they have the correct interpretation of those which remain. Therefore they guess at the course of events in that part of the record that remains, and then they supply the missing parts by other guesses; and so it is a guess all around.[57]

Jones played on the sentiments of his readers and appealed to their common sense to provide his negative perception of geology and the scientific establishment in general. He asked his audience, for example, "why are we called upon to 'assume' an 'erroneous assumption' only for the purpose of reaching an indefinite conclusion?"[58] However, it would have been obvious to the well informed that his constructed statements were skewed by a selective use of phrases that suited his particular perspective and showed his lack of true understanding of how the community of geologists was gradually advancing theoretical knowledge through the testing of hypotheses. No experienced geologist would have agreed with Jones' glibly constructed conclusions concerning the nature of their science. Yet, for an ill-informed and already skeptical audience his approach in challenging the nature of the new science was undoubtedly effective, particularly, when it would come with the imprimatur of a church elder and editor.

Weaknesses Noted in Determining the Age of the Earth

The second half of the nineteenth century saw a lively and protracted academic debate on the age of the earth amongst physicists and geologists, which Geikie duly reflected. In similar fashion to David Lord's earlier approach, Jones therefore also paid attention to the issue of 'the age of the earth.' Jones analysed the three approaches that Geikie outlined in determining the age of the earth based on the arguments from the earth's geology, the physics of the earth, and the age and origin of the sun's heat. Although age estimates for the three approaches differed substantially, all three approaches went far beyond the age of the earth as suggested by a strict literal historical reading of the Genesis narrative and neither of the three

56. Ibid. Italics by Jones.

57. Ibid.

58. Ibid.

approaches was of course acceptable to Jones. Their differences in resulting ages provided for Jones another convenient opportunity to highlight the uncertainty of geological science. The uncertainty of the variable estimates of the age of the earth based on physics led Jones to state in his familiar tone, "Yes, the geological ship has been launched upon the tide of speculation, and nothing less than one hundred million years will give her sea-room."[59] Jones showed no appreciation for the concept of working hypotheses as discussed by the community of scientists, where knowledge increases through the stimulating role of designing, testing, and refining hypotheses via an inductive process. Instead, he saw all conjectural reasoning as underscoring the blatant unscientific uncertainty of the new science of geology.

David Oldroyd asserts that Archibald Geikie was a devoted follower of the ideas and methods of his Edinburgh forebear, James Hutton.[60] It is therefore no wonder that Geikie states, as quoted by Jones, that "the sum of geological evidence is, [that] there can be found *no trace of a beginning*," and that geological history ". . . *cannot begin at the beginning* of things, but must be content to date its first chapter from the earliest period of which any record has been preserved among the rocks."[61] Jones sarcastically observes, "If, then, it begins at an uncertain place, and follows an uncertain course, and sometimes no course at all, how can the ending be anything else but uncertain?"[62] The geological argument for the age of the earth, based on present observed rates of erosion, was severely criticised by Jones because it was deemed very unreliable, being completely founded on 'assumptions.' Jones therefore concludes the following about the geological arguments for an extended age of the earth:

> Yes, no doubt, "if we assume" that such and such is the case, "probably" the balance will follow. But why are we called upon to "assume" an "erroneous assumption" only for the purpose of reaching an indefinite conclusion? …… Why may we not just as

59. Jones, "Uncertainty of Geological Science," *Signs of the Times*, 308. Sir William Thompson (1824-1907), a physicist better known as Lord Kelvin, had an interest in determining the age of the earth.

60. Oldroyd, *The Highland Controversy*, 338.

61. Original quote comes from Archibald Geikie, *Text Book of Geology*, 6-7 (italics added for emphasis by Jones). Many skeptics of James Hutton's, "Theory of the Earth; or an Investigation of the Laws Observable in the Composition, Dissolution, and Restoration of Land upon the Globe," *Transactions of the Royal Society of Edinburgh*, vol. 1, Part 2, (1788): 209–304, generally explain "no trace of a beginning" as if Hutton meant that the Earth was eternal and had no beginning and accused him of atheism. Hutton explained himself seven years later astutely by stating more clearly that it only indicates "the limit of our retrospective view of those operations which have come to pass in time, and have been conducted by supreme intelligence." James Hutton, *Theory of the Earth*, vol. 1, with Proofs and Illustrations, in Four Parts (1795) electronic edition, n.p.

62. Jones, "The Uncertainty of Geological Science," *Signs of the Times*, 292.

> rightfully assume that these changes and revolutions have been wrought in short periods, or even *suddenly?* Many of them have certainly been made violently.[63]

The Law of Superposition Challenged

Jones seriously criticised the use of the principle of the normal order of superposition of geological strata as the foundation of geological chronology. Normally, lower lying geological strata are deemed older than overlying strata. Jones scrutinised the *Text-Book* to find an exception to this rule in the form of the occasional occurrence of overturned mountain masses. Geikie made it very clear that these were exceptional occurrences and that the true order of superposition can usually quickly be identified from other sources of evidence. Indicators that experienced geologists use to determine the original position include tracing rock strata from a normal to an inverted position, studying surface-markings, ripple-marks, sun-cracks, rain-prints, footprints that provide evidence of the conditions under which sedimentary strata were formed, and/or considering the assemblages of organic remains.[64] However, Jones wondered how one can tell that "huge mountain masses are lying in a directly inverted position to that of the valleys or the plains."[65] *The Signs of the Times* version as compared to the earlier *Review and Herald* version of the same section in 'Uncertanty of Geological Science' contained an interesting added paragraph that more clearly articulated Jones' skepticism of the principles of stratigraphy used by scientific geologists. For greater emphasis, Jones used two added statements from Geikie's discussion of the order of superposition[66] (See Table 5.2). The selected quotes appeared contradicory although Geikie had made their context very clear.

Circular Reasoning Exposed and Condemned

The use of fossils for determining geological chronology led Jones to accuse geology of "reasoning in a circle."[67] The accusation of circular reasoning in geology was nothing new. David Lord had earlier accused geologists of circularity in reasoning by 'begging' the point they attempt to prove.

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63. Ibid. The gist of the final question can next be found in the works of George McCready Price and later also in the young-earth creationist literature.

64. Geikie, *Text-Book of Geology*, figures 241 and 242 on page 518; 483-6, 500, 617.

65. Jones, "The Uncertainty of Geological Science," *Signs of the Times*, 308.

66. Jones, "Uncertainty of Geological Science," *Science of the Times*, 308; Geikie, *Text-Book of Geology*, 500. Such overturned rock masses are now generally called thrust faults or simply thrusts which form through great compressional forces that have produced mountain ranges (e.g. Alps, Rocky Mountains, and Appalachians) where crustal plates have collided.

67. Jones, "Uncertainty of Geological Science," *Signs of the Times*, 308.

Table 5.2. Contrasting quotes were added to Jones' articles in *The Signs of the Times* (1885). They had not appeared in the earlier *Review and Herald* (1883) version.

Added contrasting quotes in *The Signs of the Times*	
Both quotes are from Geikie's Text-Book, p.500	
The underlying beds must be older than those which cover them. This simple and obvious truth is termed the law of superposition.	The rocks comprising huge mountain masses have been so *completely overturned* that the *highest beds* appear as *regularly covered* by others which ought properly to underlie them." In such instances "the *apparent superposition* may be deceptive.[68]

Inferring the age of the world on the hypothesis of the slow rate of processes that formed the strata would necessarily lead to a long age.[69] The philosopher, Herbert Spencer, had also pointed out the risk of reasoning in a circle where the contemporaneity of remote rock formations based on the likeness of their fossils was based on the assumption that similar organic forms were in the past more widespread than now.[70] Geikie carefully cautioned geologists in his *Text-Book* as follows: "To establish a geological horizon on limited fossil evidence, and then to assume the identity of all strata containing the same fossils, is to reason in a circle and to introduce utter confusion into our interpretation of the geological record."[71] Geikie, however, clearly explained the pragmatic nature of the procedure to establish the geological chronology.[72] His caution may well have alerted Jones who proceeded to outline what he thought was a classic example of reasoning in a circle. Without telling his audience that Geikie had explained how to avoid falling into the trap of circular reasoning, Jones contrasted two of the latter's statements that seemed to contradict each other (see Table 5.3).[73]

After disconnecting these statements from their context as they appeared in Geikie's textbook, Jones invites his audience to use their common sense to come to the following

68. It is important to note that Geikie had added (on the same page), "But these [overturned rock masses] are exceptional occurrences, wherein the true order can usually be made out from other sources of evidence." Jones failed to inform his readers of this important addition.

69. David Lord, "The Geological Theory of the Age of the Earth Examined," *Signs of the Times* 5, no. 18 (May 1, 1879): 139.

70. Herbert Spencer, "Illogical Geology," in *Universal Review*, vol. 2 (London: Wm. H. Allen, 1859), 73.

71. Geikie, *Text-Book of Geology*, 622.

72. Ibid., 615, 622-3, 631-2.

73. Jones, "Uncertainty of Geological Science," *Signs of the Times*, 308.

Table 5.3. Comparative text fragments on chronology as contrasted by Jones from the *Text-Book of Geology*. Note the great difference in provenance of the quotes. The left quote comes from the first page of the textbook, the quote on the right seems contrived from several similar statements towards the end of the book.

Archibald Geikie, *Text-Book of Geology*	
Page 2	Pages 615, 622, 632?
It is mainly the *remains* of plants and animals (fossils) *imbedded in the rocks* that the geologist is guided in unravelling the *chronological succession* of geological changes.	The *chronological sequence* (succession) *of fossils* (remains) must be determined first of all by the *order of superposition* (chronological succession) of their enclosing strata.[74]

conclusion: "One of these says that *the relative age of the rocks* is determined *by the fossils*. The other says that the *relative age of the fossils* is determined *by the rocks*. What is this but reasoning in a circle?"[75] This constituted 'contextomy', removing a passage from its context to distort its intended meaning and was a serious breach of intellectual integrity by Jones.

Without professional field training and scientific experience in how to unravel complex geological field situations, such statements would have seemed contradictory to Jones and he therefore concludes with the statement: "All this may be ***geo***logical, but it assuredly is not logical, nor is it according to established rules of evidence."[76]

The use of rocks to date fossils and alternatively the use of fossils to date rocks has continued to confuse intelligent non-professionals but the answer is simply in the pragmatic basis of stratigraphy.[77] Through the work of the extended community of geologists around the world, a geological time-scale or column has been constructed "based on a factual superposition of [local sequences of] rocks yielding a factual superposition of paleontological criteria."[78] Once that geological timescale had been tested and approved by the community of geologists, paleontological criteria could then, in turn, be used to determine the relative position of any local rock sequence within that theoretical geological column.

74. Geikie, *Text-Book*. The gist of the sentence appears to be constructed from fragments of pp. 615, 622 and/or 632. The pdf 'find' function does not lead to the actual quote.

75. Jones, "Uncertainty of Geological Science," *Signs of the Times*, 308.

76. Ibid.

77. J. E. O'Rourke, "Pragmatism versus Materialism in Stratigraphy," *American Journal of Science* 276 (January 1976): 47, 55.

78. J. R. Van de Fliert, "Fundamentalism and the Fundamentals of Geology," *Journal of the American Scientific Affiliation* 9 (1969): 74.

Table 5.4. Jones' use of contrasting quotes on circular reasoning from Geikie's *Text-Book of Geology*.

Archibald Geikie, *Text-Book of Geology*	
Pages 622-3	Page 632
The first and fundamental point is to *determine accurately the order of superposition* [succession] *of the strata*. Until this is done, detailed *paleontological* [fossils] *classification may prove to be worthless*.[79]	When *the order of succession of organic remains* [fossils] among the stratified rocks *has been determined*, they become an *invaluable guide* in the investigation of the *relative age of rocks* and the structure of the land. And the *true succession* [superposition*] of strata may be confidently established.*[80]

Ironically, when Jones later contrasted two separate statements with the intention of showing more evidence of circularity in reasoning, he actually correctly spelled out the pragmatic basis of stratigraphical reasoning (see Table 5.4). When the correct order of superposition of rock strata, *including its paleontological criteria*, has been satisfactorily determined, that then becomes a tool to use to see where any local rock sequence fits in the geological column. However, for Jones, it did not seem to make sense, and he saw it, instead, as evidence that the whole system of Geological Science "can be nothing less than worthless."[81] Such a science, according to him, "comes within the scope of Paul's words in 1 Tim. 6:20."[82] "O Timothy, keep that which is committed to thy trust, avoiding profane and vain babblings, and oppositions of science falsely so-called" (KJV). It is interesting to note that Jones labelled geology as a 'science falsely so-called,' not because of its unbiblical stance, but because of its perceived unscientific circular reasoning.

Geikie's extended discussion of the relative importance of mineralogical and palaeontological criteria for determining the stratigraphy must be seen in the light of the recent "gentlemanly settlement" of a scientific controversy over Silurian rocks in Devonshire, UK, that had taken place in the 1830-40s.[83] At issue during the 1830s had been a disagreement amongst British geologists about how to interpret and date certain types of

79. Geikie, *Text-Book,* 622-623; Jones, "Uncertainty of Geological Science," *Signs of the Times,* 308.

80. Geikie, *Text-Book,* 632 (quoted by Jones with some minor differences from the original text); Jones, "Uncertainty of Geological Science," *Signs of the Times,* 308.

81. Jones, "Uncertainty of Geological Science," *Signs of the Times,* 324.

82. Ibid.

83. See Martin J. S. Rudwick's much acclaimed *The Great Devonian Controversy. The Shaping of Scientific Knowledge among Gentlemanly Specialists* (Chicago and London: University of Chicago Press, 1985). It compares the approaches of two groups of geologists that use either mainly mineralogical or palaeontological criteria to settle a difference of opinion on the stratigraphy in Devonshire and how a scientific consensus was eventually reached.

rocks (Greywacke) in Devon. The two major proponents of the controversy were Henry T. De la Beche and Roderick I. Murchison. De la Beche had found plant fossils in rock layers that were not expected to have such plant life. In fact, the fossils resembled the much younger Carboniferous coal strata. The methodological problem was narrowed down to the question whether rock strata were to be classified based on lithology (the physical characteristics of the rocks, including colour, composition and grain size) or fossil content. In response, Murchison and his colleagues collected empirical evidence from other locations in Europe and especially from the Silurian rock strata of Russia to consider the bigger geological picture.[84] Based on their new findings and after a decade of on-going scientific communication and eventual scientific consensus, the novel Devonian geological period was introduced between the earlier Silurian and the later Carboniferous strata.[85]

Geikie had outlined how the expert geologists reached consensus on the complex stratigraphy of the Palaeozoic Silurian and Devonian rocks. Jones used a number of short quotes relating to rock formations of the Upper Silurian[86], the Cambrian[87], and the Old Red Sandstone[88] to show that according to him very serious problems existed with the methodology of the geologists. However, the selected quotes were very short and did not tell the whole story. Jones continued to accuse the geologists–based on the juxtaposed brief quotes–of determining the stratigraphic boundaries between rock formations on the evidence of fossils *before* the order of succession had been accurately determined.

Barrande's 'Colonies,' Contemporaneity, and Homotaxis

Besides the complexity of 'normal' stratigraphic situations, Jones brought up the very technical issue of the 'Barrande Colonies' as a further example to show "the utter

84. Murchison had been a great inspiration for Geikie in his development as a geologist and it is no wonder that he represented Murchison most strongly in the discussion of the Palaeozoic stratigraphy. David Oldroyd, *The Highlands Controversy*, 338.

85. The debate on this issue is fundamental for understanding the developing methodology of the new science of geology; existing theory in the 1830s could not accommodate the new facts and it took the scientific geologic fraternity a decade of additional data collection, exchanges of letters, discussions at scientific societies, and many returns to the field site to further study the stratigraphy to develop a solution to the problem. Many historians consider this a watershed moment in the history and philosophy of geology in the 19th century. It resulted in a significant new piece of reliable knowledge, and the fact that the Devonian Controversy is now all but forgotten indicates that geologists now take the new knowledge for granted (Martin J. Rudwick, *The Great Devonian Controversy*, xxi). Rudwick provides an extremely detailed report and analysis of the on-going communication, sometimes on a daily basis, between the principals of the dispute.

86. Archibald Geikie, *Text-Book of Geology*, 673. Jones, "Uncertainty of Geological Science," *Signs of the Times*, 340.

87. Geikie, *Text-Book of Geology*, 653; Jones, "Uncertainty of Geological Science," 340.

88. Geikie, *Text-Book of Geology*, 711; Jones, "Uncertainty of Geological Science," 340.

worthlessness of the deductions of the geological scientists."[89] During the mid-nineteenth century there was in Europe an on-going scientific discussion concerning the correct stratigraphy of the Palaeozoic Silurian System (416-444 Ma).[90] To help solve the issue, the French palaeontologist and stratigrapher, Joachim Barrande (1799-1883), chose to investigate the Silurian System strata of Bohemia. However, there was more complexity. He found assemblages of younger fossils apparently intercalated among older rocks. Not quite knowing how to explain this occurrence, he interpreted it as a group of 'precursor fossils' which he called a 'colony'. For several decades the 'Barrande colonies' remained a sort of an enigma and an on-going point of investigation.

At the publication of his *Text-Book* in 1882, Geikie still spoke favourably concerning Barrande's elegant solution to the problem.[91] It should be realised that during this time Geikie was also involved in the mapping of a similar complex geological terrane[92] in the Southern Uplands in Scotland.[93] Decades later, the Barrande colonies controversy was finally resolved by the recognition of complex 'bedding-parallel faulting' that may develop concurrently with severe over-thrust faulting.[94] The result is that through this type of faulting, which can be extremely difficult to detect, it will appear as if younger fossils 'seamlessly' occur within older rocks. For Jones, the Barrande "facts" of the colonies were another example that fossils can definitely not be used to date rocks.[95] Jones inserted an additional paragraph in the edited *The Signs of the Times* version of his article series to emphasise his strong negative opinion on using successions of species of fossils for dating rocks:

> Now, as we have seen that the undisputed facts, as developed in Barrande's "doctrine of Colonies," show that just "such cases" (sic) "have again and again taken place,"

89. Jones, "Uncertainty of Geological Science," *Signs of the Times*, 324.

90. 1 Ma stands for 1 Million years ago. At that time the geologists of course did not have absolute quantative dates yet.

91. Geikie, *Text-Book*, 627-30. Geikie recognised this then (perceived) imperfection of the Geologic Record. David R. Oldroyd, *The Highlands Controversy: Constructing Geological Knowledge through Fieldwork in Nineteenth-Century Britain* (Chicago: University of Chicago Press, 1990), 224 (footnote 11).

92. 'Terrane' is a geological term used to indicate an area over which a particular rock or group of rocks is prevalent.

93. Geikie, *Text-Book of Geology*, 629. Geikie described a similar situation in the Lower Silurian rocks of South Scotland but the Barrande hypothesis of colonies was not officially invoked there (David R. Oldroyd, *The Highlands Controversy*, 224).

94. It is still a topic of interest, see: Petr Ferbar, Jiri Janecka and Rostilav Melichar, "Some Aspects of the Barrandian Tectonics – Preliminary Results," *Geolines* 16 (2003), 29-30.

95. Jones, "Uncertainty of Geological Science," *Signs of the Times*, 340.

> therefore it is proven that whatever generalisations have been built up on the evidence of distinctive species of fossils, are, by these facts, "demolished altogether."[96]

This quote seems to be more directed against evolution than geology *per se*. Jones may be forgiven for his misinterpretation of this very complex situation in 1885. The complexity and subtleness of this issue was not yet fully understood at that time and for him this must have appeared to support his accusation of circular reasoning.

The fact that Jones gave so much attention to Barrande's colonies is, however, significant. Jones created the impression for his audience of lay readers, unfamiliar with geological stratigraphy, that this exception was a major upset to the geological use of fossils in typifying rock formations. This was not really the case. The professional geological fraternity went about solving the problem and untying this 'Gordian Knot' in a scientific way, while field geologists continued to use principles based on the majority of cases. The colonies or 'precursor bands' were clearly minor exceptions to the established normal order of the occurrence of fossils in their age-related rocks. Using exceptions beyond their actual proportions to 'prove' that 'generalisations' were useless became a useful tool to try to convince a lay audience.

Interwoven in Jones' discussion of Barrande's precursor bands was the issue of geological contemporaneity, or whether the fossil content may be used to determine the similarity in age of rock strata even for far removed local sequences. The issue of contemporaneity for remote local strata was an equally much-debated topic during the second half of the nineteenth century. As earlier noted, the armchair philosopher, Herbert Spencer, who was not a geologist by any measure had, in 1859, approached the issue theoretically and not pragmatically, and doubted whether calling rock formations in remote regions contemporaneous because of their fossil content was a theoretical fallacy and implied using circular reasoning.[97]

The biologist T. H. Huxley, who, according to Lyell, was never much of a field geologist, introduced the term 'homotaxis' for geologists in 1862 to avoid having to prove strict contemporaneity.[98] Homotaxis implied similarity of order of succession of fossils,

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96. Ibid. Quotation marks shown as used by Jones.

97. Spencer, "Illogical Geology," 73.

98. T. H. Huxley, "The Anniversary Address," *Quarterly Journal of the Geological Society of London* 18 (1862), xlii; Huxley's lack of field experience is mentioned in a letter from Lyell to Principal Dawson dated July 31, 1868; K.M. Lyell (ed.) *Life, Letters and Journals of Sir Charles Lyell, Bart*, Volume 2 (Cambridge: Cambridge University Press, 2010), 428.

which according to Huxley, could more easily be demonstrated than synchrony, especially for widely separated strata. In the absence of radiometric dating and the inability to prove contemporaneity for isolated rock outcrops, geologists like John Edward Marr were in favour of the new concept.[99] Others, like Lyell, thought that it was scientifically too cautious, too disconnected from the time-stratigraphic aspect, and felt that proof of real contemporaneity of similar formations with increasing field evidence was growing stronger.[100] Geikie extensively addressed the issue because of its currency and Jones duly reported on the concept of contemporaneity in his article series. For most of the readers of the *Review and Herald* who lacked access to contemporary academic material there was no opportunity to evaluate the discussion for themselves. They had to take Jones' word for it.

5.5.2 Evolution and Geology

Lack of Scientific Demonstration

Additionally, Jones brought up the fact that geology lacks "*demonstration*" and that it was "*not susceptible of demonstration.*"

> The one essential element that is lacking in all these productions on geology is *demonstration*. Assumption upon assumption, and inference upon inference, are proposed upon confessedly uncertain data, and from that, then *speculation*, to an unlimited degree, is indulged in, and all this is offered to us in the name of science![101]

He related this with some irony to Hebrews 11:1 that 'faith is the evidence of things not seen' and stated that,

> If the formation, the growth, and the structure of the earth, can be *shown* by geology, if it can be demonstrated, so that it may be a *matter of knowledge,* just then it will be removed from the field of faith.[102]

Jones' declaration on the lack of demonstration of geological science echoed an earlier statement from David Lord printed in *The Signs of the Times* in 1879.[103] Lord had stated emphatically that geology is not a "demonstrative science" and that geologists "furnish no means of a scientific demonstration of a different and higher class of truth." It is interesting to note that David Lord and Alonzo Jones used similar arguments of inferences

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99. J. E. Marr, "On Homotaxis," *Proceedings of the Cambridge Philosophical Society*, 6 (February 14, 1887): 74.

100. K.M. Lyell, *Life, Letters and Journals of Sir Charles Lyell, Bart*, 428.

101. Jones, "Uncertainty of Geological Science," *Signs of the Times*, 340.

102. Ibid.

103. David Lord, "False Notions of Geology," 163.

(reliance on assumptions and hypotheses), lack of demonstrativeness, and circularity in reasoning to argue that geology was not a real science. Therefore, they argued, if it is unscientific, geology cannot be used to challenge the facts of the Bible. Jones' use of the same arguments that Lord had used before, suggests Jones' familiarity with David Lord's writing. For both geology and evolution Jones would come to the same conclusion concerning its lack of demonstration (see Table 5.5).

Jones' Evolution Articles

Jones' evolution articles, in 1885 [ST-EE] (Appendix B), were the first major responses by an Adventist elder in *The Signs of the Times* to reflect on Darwin's publications of *Origins* (1859) and *Descent of Man* (1871). Previously, there had been shorter articles such as '*Is Evolution Science?*' by D. S Gregory, which had been reprinted in *The Signs of the Times* (July 29, 1880) from The *Independent* of May 27, 1880, and a brief editorial article '*Evolution*' in *The Signs of the Times* issue of January 24, 1884.[104] The delay in responding to this issue was not just specific to Adventists but should be generally understood in the historical context of the time. In connection with this, Frederick Gregory suggests, "in general the *Origin* made little direct impact on American theology in the years immediately following 1859."[105] Darwin's *Origin* was considered by most as a [too] serious biological scientific work. Darwin's other scientific work, *The Descent of Man*, was morally more difficult to accept because of the reference to man's inferred lineage from apes and definitely got much quicker attention from the general public. *The Descent of Man* (1871) horrified conservative Christians with the thought that they had "descended from a hairy quadruped, furnished with a tail, and pointed ears."[106]

The American Civil War (1861-65) was another delaying factor in the response by the orthodox Church to Darwin's *Origin* (1859) and, according to Gregory, "Not until 1874 did a serious spokesman for the orthodox position emerge in America."[107] This spokesperson was the Presbyterian theologian Charles Hodge (1797-1878), who discussed the question, *What is*

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104. [J. H. Waggoner?], "Evolution," *Signs of the Times* 10, no. 4 (January 24, 1884): 51.

105. Frederick Gregory, "The Impact of Darwinian Evolution on Protestant Theology in the Nineteenth Century," in *God and Nature: Historical Essays on the Encounter between Christianity and Science,* ed., David C. Lindberg and Ronald L. Numbers (Berkeley, CA: University of California Press, 1986), 375.

106. P. R. Russel, "Darwinism Examined," *Review and Herald* 47, no. 20 (May 18, 1876): 153; Ronald L. Numbers, "Experiencing Evolution: Darwinism and the Diminution of Religious Belief" (Templeton Research Lecture, University of California, Santa Barbara, February 6, 2003).

107. Gregory, "Impact of Darwinian Evolution," 375.

Darwinism?[108] Furthermore, from around the late 1870s to mid-1880s, liberal theologians were reconciling evolution with Genesis. This leaning towards a theistic evolution generated adverse reactions from the more orthodox Christians during the early 1880s.[109]

After having outlined the flaws of geology, Jones continued with the second part of the article series in *The Signs of the Times* which he titled " 'Evolution' and Evolution" [ST-EE] to evaluate concepts concerning evolution. He refrained from emphasising the connection between geology and evolution until the last article of the series (vol. 11, no. 26, July 2, 1885).

Darwinism and Evolution

Alonzo Jones chose " 'Evolution' and Evolution" as an awkward title for this part of the article series. It became evident from the context of the articles that the first evolution term within quotation marks referred to Darwinism. Jones attempted to compare and contrast Darwinism and evolution. Darwinism had right from its first use in the early 1860s been a loaded term that has had differing connotations over time. For a small number of Darwin's friends and colleagues, Darwinism meant "undifferentiated evolutionary naturalism in the anticreationist mode."[110] Especially directly after the publication of the *Descent of Man*, the magazines were full of articles on Darwinism in relation to religion, morals, and philosophy.[111] However, Darwin's main contribution had clearly been about natural selection and its relationship to species modification with descent.[112] It was only later on during the last quarter of the nineteenth century that Darwinism as a term became deservedly equated with Darwin's descriptions of descent with modification and natural selection. It is within this late nineteenth century context of mixed understanding of Darwinism and evolution, that we

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108. Charles Hodge, *What is Darwinism?* (New York: Scribner, Armstrong, 1874).

109. Gregory, "Impact of Darwinian Evolution," 379-83.

110. James Moore, "Deconstructing Darwinism: The Politics of Evolution in the 1860s," *Journal of the History of Biology* 24, no. 3 (Fall 1991): 365.

111. Moore, "Deconstructing Darwinism," 399. It was published from 1848 to 1928.

112. For Darwin's own assessment of his "main Contribution," see Charles Darwin to Asa Gray, May 11, 1863, quoted in *The Life and Letters of Charles Darwin*, ed. Francis Darwin, 2 vols. (New York: Appleton, 1896), vol. 2, 163-4: "**Personally, of course, I care much about Natural Selection, but that seems to me utterly unimportant, compared to the question of Creation or Modification**." See also: Vol.1, 146-7: In writing the *Origin*, "I had two distinct objects in view, firstly, to show that species had not been separately created, and secondly, that natural selection had been the chief agent of change, thought largely aided by the inherited effects of habit, and slightly by the direct action of the surrounding conditions. . . . Some of those who admit the principle of evolution, but reject natural selection, seem to forget, when criticizing my book, that I had the above two objections in view; hence if I have erred in giving to natural selection great power, which I am far from admitting, or in having exaggerated its power, which is in itself probable, I have at least, as I hope, done good service in aiding to overthrow the dogma of separate creations."

should read Jones' evolution articles. Jones finished his comparison by concluding that evolution and Darwinism were essentially synonymous.

Historical Criticism and [A]theistic Evolution

Jones was a contemporary of the German Higher Criticism movement.[113] He did not explicitly mention the movement in his evolution articles but, instead, made indirect reference to it and alluded to a link with theistic evolution. He quoted an editorial article in the New York *Independent* that stated that certain German theologians claimed that the story of the creation was not to be accepted as history.[114] This Higher Criticism view of the German theologians led Jones to make a connection with theistic evolution, which had gained popularity in North America through the 1870s. Theistic evolution developed as a form of evolution that acknowledged God as a Creator being involved in the development of life. According to Jones, people adopted theistic evolution because, although they acknowledged the process of evolution, they still hung on to a belief in the immortality of the soul. To Jones such a view was entirely inconsistent. He argues:

> theistic evolution, holding, in common with evolution 'straight,' the antagonism to the doctrine of creationism; when it admits the interference of God on behalf of the immortal soul, it therein admits the doctrine of creation; for assuredly the bestowal of immortality upon that which has been evolved from apes and lower forms of animals is nothing short of a creative act, or volition, of God.[115]

For Jones the inevitable consequence was that "the doctrine [of theistic evolution] is inconsistent with itself."[116] He saw therefore no distinction between the two forms of evolution, and therefore concludes that this "so-called theistic evolution" is nothing less than "***a***theistic evolution."[117]

No Evolution without Geology

Concerning the scientific foundation of evolution, Jones asserted that the theory of evolution when compared, for example, to Kepler's three laws of planetary motion in

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113. The Higher Criticism movement arose from the work of a group of nineteenth century German biblical scholars who applied literary historical-critical methods to assess the Old Testament of the Bible as literature in order to better understand it. Many orthodox Christians connected this movement with the contemporary popularity of secularism, evolutionary thought, and atheism. They felt that both geology and Higher Criticism were greatly at odds with a literal reading of the Bible.

114. Editorial by Wm Hayes Ward, D. D. in the *Independent* issue of February 26, 1880.

115. Jones, " 'Evolution' and Evolution," *Signs of the Times*, 372.

116. Ibid.

117. Jones, " 'Evolution' and Evolution," *Signs of the Times*, 388.

astronomy, which are demonstrated by the exact science of mathematics, clearly lacked the same foundation. According to Jones, the lack of such a demonstration in the theory of evolution left it "scarcely to be wondered . . . that such a theory is atheistic."[118]

He emphatically states that "it is with [evolution] as with geology, -simply and only 'perhaps,' 'no doubt,' probably,' and 'must have been,' and these repeated over and over again, and then all of them capped with an 'assumption'."[119] Jones provided numerous quotations that showed Darwin's frequent use of the above 'uncertainty' terms in *Descent of Man*. With reference to 1Tim. 6:20, 21, he concludes: "O Timothy, *keep that* which is committed to thy trust, avoiding profane and *vain babblings*, and opposition of science *falsely so-called*, which some professing have *erred concerning the faith*."[120] For Jones geology and evolution were unquestionably linked by their unscientific nature. He states:

> Of those who have read, attentively, these articles on Evolution, and those on Geology which preceded these, no one can fail to see the striking similarity in the essential characteristics, and the manner of treatment, of the two so-called sciences, as drawn from the writings of their most eminent representatives [Charles Darwin and Archibald Geikie].[121]

Jones was quick to assert that, of course, he was not at all opposed to true science and had genuine admiration for science, *but* it must be "real science, and not sham science."[122]

According to Jones, not only were geology and evolution, linked through their unscientific and atheistic character, evolution was absolutely dependent upon geology. Without geology, evolution can have no place."[123] As proof, he quotes Darwin: "*The high antiquity of man* . . . is the *indispensable basis* for understanding his origin."[124] To make his message perfectly clear to his audience he concludes:

> And thus the two 'falsely so-called' sciences unite, not only to destroy faith in the word of God, but to rob the Creator of his prerogative and remove him from his throne. Geological science goes before and upon the basis of its deductions demands that we give up the *first chapter of Genesis*. With this as its 'indispensible basis'

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118. Ibid., 389.

119. Jones, " 'Evolution' and Evolution," *Signs of the Times*, 388.

120. Ibid., 389.

121. Jones, " 'Evolution' and Evolution," *Signs of the Times*, 404.

122. Ibid.

123. Ibid.

124. Charles Darwin, *The Descent of Man, and Selection in relation to Sex*, vol. 1, (London: D. John Murray, 1871), 3; Jones, " 'Evolution' and Evolution," *Signs of the Times*, 404.

evolution follows after and upon *its* deductions demands that we give up *the whole Bible*.[125]

5.6 The Impact of Jones' Geology and Evolution Article Series

Alonzo Jones' article series has significant historical importance because we see here in the Adventist media the beginning of a definitive change from the earlier arguments of the American scriptural geologists against modern geology *per se* to arguments against the concept of evolution. The scriptural geologists had criticised the professional geologists for how they devised theories which were in conflict with the Mosaic narratives. The later flood geologists, however, would use the perceived scientific weaknesses of geology as a 'tool of convenience' against evolution. It is interesting to note that Jones was the first Seventh-day Adventist to emphatically state the connection between geology and evolution. Whilst we can find the roots of the arguments on the uncertainties of geology in the reprints of David N. Lord's *Geognosy* and the *Review and Herald* articles, there remains the need for explaining the perceived strong geology-evolution connection that Jones exposed. Jones may have stumbled across a brief section entitled, "Bearing of Palaeontological data upon Evolution" through his meticulous reading of Archibald Geikie's *Text-Book.*[126] However, it should also be noted that other regional religious newspapers had already documented the perceived supportive role of geology for Darwinism.[127] Jones definitively did not write in a vacuum and was undoubtedly influenced by the current thinking in orthodox Christian circles. Geikie's section on the "Bearing of Palaeontological data on Evolution" may have simply reinforced Jones' existing thoughts.

Geikie argued that awareness of a gradual progression of organic life forms in rock strata had been growing since William Smith first used fossils in geological mapping at the turn of the nineteenth century. It was thought that fossils could be useful for finding correlations of strata over some distances.[128] Geikie states: "Until the appearance of Darwin's

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125. Jones, " 'Evolution' and Evolution," *Signs of the Times*, 404.

126. Archibald Geikie, *Text-Book of Geology*, 623-27.

127. Jerry N. Pittman, "Darwinism and Evolutionary Science Critiqued: The Response of Three Nova Scotia Religious Newspapers," (PhD diss., University of New Brunswick, 1990), 141-43. Whilst the main stream religious periodical journals in the latter years of the 19th century gradually moved to a more theistic form of evolution (see for example Jerry Pittman's thesis conclusion, p. 183), the Adventist press stuck to its literal, factual Baconian common sense philosophy as inherited from William Miller's interpretation of biblical prophecies.

128. One should remain aware that British authors tend to fall victim to hagiography of their fellow British geologists, and that the discovery of the directionality in development of life forms was certainly not exclusively a British thing.

'Origin of Species' in 1859 the significance of this progression and its connection with the biological relations of existing faunas and floras were only dimly perceived".[129] Towards the end of the section, Geikie concludes: "The existing forms of life are the outcome of the evolution which has been in progress during the whole of geological time."[130] The connection that Geikie makes here between palaeontology (geology), evolution, and Charles Darwin could have encouraged Jones to further investigate this connection. It also becomes evident from the articles, that Jones had access to a copy of Darwin's *Descent of Man* (which makes a similarly strong connection). In addition, Jones referenced the *Independent* and *Encyclopaedia Britannica* as his sources of information.[131]

5.6.1 Intentions, Perspective, Perceptions

Ultimately, Jones was not a geologist and lacked an academic foundation for a scientific review of such an authorative geological textbook by Archibald Geikie. However, Jones undauntingly applied his tried technique of unearthing what seemed to him to be contrasting quotes from the text. Reading Geikie's 1,000-page textbook would have been an intimidating exercise even for a student of geology and Jones' application to his task may be grudgingly admired.

What was Jones' intention? Why did he write the articles? We can infer from the article sequence that Jones intended to provide the Adventist lay congregation with a response to the perceived challenges of geology and evolution. How do people generally deal with situations that seriously challenge their beliefs? Paul de Vries discusses a number of options which may be exercised when one faces science which contradicts one's genuine 'control beliefs' (basic beliefs, preunderstandings, or worldview).[132] One of them is to challenge the assumptions or methodologies of the alleged 'science' and argue that it is only a pseudoscience or 'science falsely so-called.' Adventist elders had done this from the late 1850s. Encouraged by Ellen White's 1864 critical view of 'infidel' geology and similar perceptions in the *Review and Herald*, Jones' reaction was to look for flaws to more seriously challenge the science of geology.

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129. Archibald Geikie, *Text-Book of Geology*, 624.

130. Ibid., 627.

131. Alonzo Jones uses, for example, information from the Biology section of the *Encyclopaedia Britannica* in " 'Evolution' and Evolution," *Signs of the Times* 11, no. 25 (June 25, 1885): 388.

132. Paul de Vries, "Naturalism in the Natural Sciences: A Christian Perspective," *Christian Scholar's Review* 15, no. 4 (Summer 1986): 393.

Jones' perspective of science was purely Baconian. It is ironic that the hypothetic approach to geology that was specifically praised by Gilbert (the experienced field geologist-reviewer), led Jones (with no expertise in theoretical or practical geology at all) to identify the same approach as the central facet of the science and its major weakness.

The perception that Jones conveyed, that "geology and evolution are essentially alike,"[133] is however incorrect in many aspects. Although they share the use of hypothetic reasoning, geology as a science deals primarily with the rock strata of the earth's crust and tries to unravel the geological structures and physical history locked up in the earth crust. Causal evolution theories deal with explanations of how various types of animals and plants could have changed across generations over time. The theoretical, global geological column was constructed on the basis of numerous local rock exposures and their physical and organic characteristics. The basic structure of the geological column had been completed several decades *before* scientific evolutionary theories started to be published. The Adventist lay audience did not have access to original scientific documents and relied on the material that Jones had selected for his article series. Jones was the *de facto* gate-keeper or 'filterer' of the flow of important information for others to form their opinions. His position as an elder and magazine editor lent credibility to the material that he presented.

5.6.2 An Important Nexus and Catalyst Influence within the Thought Engagement Process

Without a doubt, Jones made a noteworthy contribution to Adventism's thought engagement with the new geology during the late nineteenth century and provided a link between the mid-nineteenth century Congregationalist scriptural geologist David Lord and later, more prominent figures. It is evident that Jones used similar arguments as had been discussed earlier by David Lord as published in *The Signs of the Times* in 1879 and the *Review and Herald* in 1880 (see Table 5.5) and *Geognosy*. Jones showed, with a typical Baconian perspective, an aversion to geology's use of assumptions, inferences, and hypotheses. He strongly agreed with Lord on the observation that geology was *not* a demonstrative science. Additionally, Jones, with even greater emphasis than Lord, pointed to geology's perceived fallacy of entertaining circular reasoning and, most significantly, challenged the validity of stratigraphy in geology. Jones had searched and, he thought, had found in its use of stratigraphy a weakness in geology's reasoning. George McCready Price would next flesh out this perceived weakness (chapter six).

133. Jones, " 'Evolution' and Evolution," 404.

Table 5.5. Comparison of statements used by David Lord in *Geognosy* (1855) and Alonzo Jones in *The Signs of the Times* (1885).

David Lord, *Geognosy* (1855) [Parts of first three chapters were reprinted in *The Signs of the Times* (1879)]	**Alonzo Jones, "Uncertainty of Geological Science," *The Signs of the Times* (1885)**
Too many assumptions and hypotheses	
Geologists must not assume . . . as preparative of their hypotheses. (p. 17) To build an inference of the age of the world on such an assumption, is therefore to build it on a hypothesis of what cannot be shown to have been a fact. (p. 20) They must not assume any condition of the world, the existence of any agents, or the occurrence of any events, the reality of which they cannot demonstrate. (p. 24)	Assumption upon assumption, and inference upon inference, are proposed upon confessedly uncertain data, and from that, then *speculation*, to an unlimited degree, is indulged in, and all this is offered to us in the name of science! (p. 340)
Geology is not a demonstrative science	
It is not, therefore, a demonstrative science in the usual sense of the term. Its facts do not furnish the media of deducing a set of general laws peculiar to itself, by which all the phenomena of which it treats can be explained. (p. 59)	The one essential element that is lacking in all these productions on geology is *demonstration*. Astronomy is. When from the fall of an apple, Newton reached the law that governs every particle of matter in the universe, *that* was *Science.* (p. 340)
Use of circular reasoning	
Inference of the age of the world based on an hypothesis . . . is to beg at the outset the very point which they affect to prove. (p. 23) Take away the hypothesis and the inference becomes a non sequitur. (p.67)	One of these [Geikie's quotations] says that the *age of the rocks* is demonstrated *by the fossils.* The other says that *the relative age of the fossils* is determined *by the rocks.* What is this but reasoning in a circle? (p. 308)
Strata and the formation of mountain masses	
[Geology] is to be tried by the laws of nature, the great facts of the strata, and the forces that are now and have been at work in modifying the earth's surface. (p. 15) Such a construction of the crust of the earth . . . leaves unexplained some of the great processes to which it has been subjected; such as the upheaval and dislocation of the strata and the elevation of continents and mountains. (p. 403-4. **N.B.** this last quote was not part of the sections as reprinted in *The Signs of the Times*)	And what then becomes of the law of superposition [of the strata]? . . . the superposition of strata may be deceptive. If huge mountain masses are lying in a directly inverted position to that of the valleys or the plains, how can we tell which is "upside down"? And how is the true order of super position [of strata] to be settled? (p. 308)

5.7 Conclusion

Prior to Jones' contribution to the debate, the reaction to geology had, except for Ellen White's panoramic metanarrative, been based on secondary information from other magazines and books as it got published in the Adventist Church periodicals. Ellen White's reaction to the influences of geology and the geologists on Adventist thought was greatly bolstered by her charismatic status as a prophet within the Adventist Church. Her narrative cemented the negative perception of the science and its practitioners. Most of the geological statements contained in her metanarrative reflected outdated concepts of the eighteenth

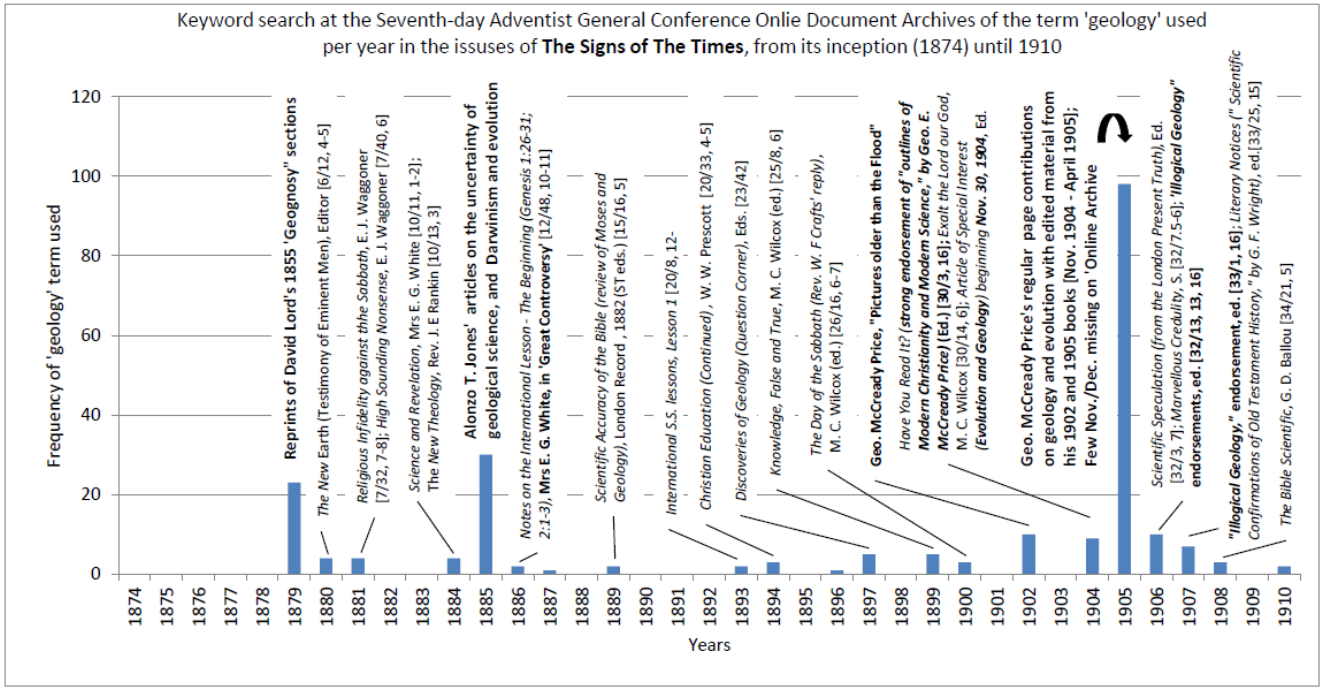


Figure 5.2. Online Frequency of the term 'geology' used in *The Signs of the Times* between 1874 and 1910. There were distinct frequency peaks in 1879 (David Lord reprints), 1885 (Alonzo Jones' articles), and around 1905 (regular articles by George McCready Price).

century and earlier (see chapter 3). No genuine interaction between primary geological source material and Adventist authors had taken place prior to Jones' contribution. Jones was the first Adventist elder to seek information closer to the source.

Although Jones' contributions towards geological thinking and Adventism has been noted by Ronald Numbers,[134] the context and impact of his contributions has not been researched. This chapter has argued that his impact has been underrated[135] and that Jones' analysis forms a bridge between Lord's earlier work and Ellen White's metanarrative, and George McCready Price's later Flood geology. This is somewhat suggested in figure 5.2 where the three most prominent contributions to geology is that due to Lord, Jones, and McCready Price in that order. However, Jones was not simply an important link, he also greatly intensified the engagement. Through Jones' articles Adventism reacted more strongly and directly than ever before to geological theory and methodology. In true fashion, Jones' catalytic interference was intense and short-lived but its impact had a long-term and

134. Ronald L. Numbers, "Science Falsely So-Called: Evolution and Adventists in the Nineteenth Century," *JASA* (March 1975): 19-20.

135. His geological interests have not featured in any of his biographies.

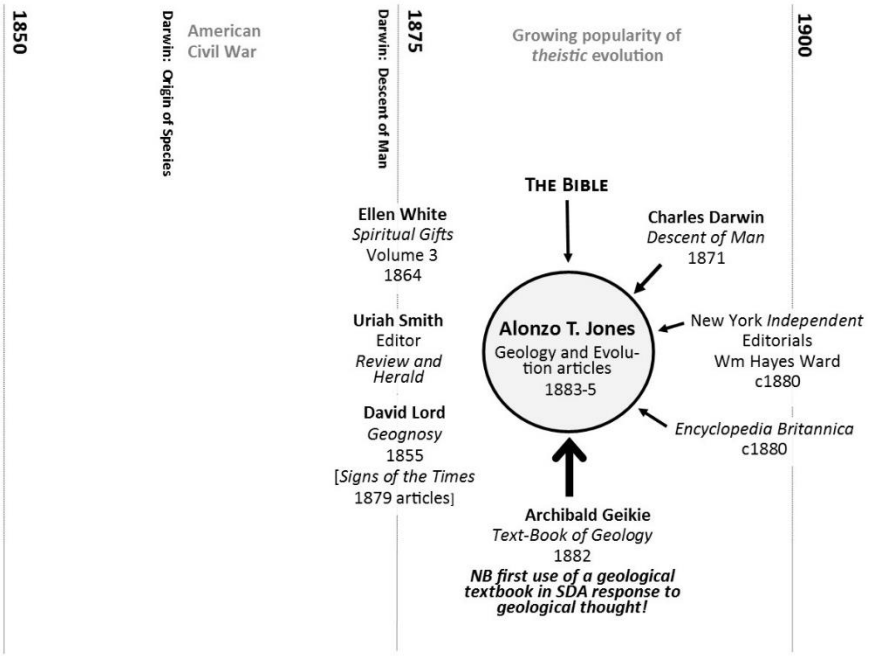


Figure 5.3. Noted influences on Alonzo Jones' Geology and Evolution articles in The *Review and Herald* (1883-4) and *The Signs of the Times* (1885). Archibald Geikie's *Text-Book* was his only source used for his evaluation of geology. Jones made use of Darwin's *Descent of Man* for the section on evolution. The absence of arrows indicates influence noted but lack of direct evidence.

significant influence. Although Jones was personally not further involved in geology or evolution, his contribution significantly influenced the future direction of the engagement between geology and Adventist thought. Compared to the earlier writing on the thought engagement, which seemed very distant from the actual science, Jones added authentic evidence from having perused some contemporary geological literature (see fig. 5.3). Earlier reactions in the Adventist periodicals on the topic had generally come from contributors outside Adventism. This was the first time that the reaction originated from within Adventism, which made the engagement far more original. Together with the use of authentic geological texts there also appeared the first questionable signs of quote mining in building up arguments against geology. The use of contextomy unfortunately eroded the intellectual integrity of Jones' geology and evolution articles. This was to have a significant impact on the direction the Adventist engagement was to take as the twentieth century emerged.

Chapter 6

George McCready Price's Response: A New Geology

> . . . *evolutionary geology or the Deluge: which shall it be?* For the one is the exact antithesis of the other. If the one is true, the other must be false . . . *The one issue now left before the scientific world, so far as these questions are concerned, is the problem connected with the geology upon which the evolution theory is logically and historically built.* And we know that this is historically and logically the weakest point in the whole theory.
>
> — George McCready Price, *Science and Religion in a Nutshell*

> I am not a geologist.
>
> — Geo. E. McCready Price, *Outlines of Modern Christianity and Modern Science*

> So carefully reasoned are Price's speculations, so bolstered with impressive geological erudition, that thousands of Protestant fundamentalists today accept his work as the final word on the subject. Even the skeptical reader will find Price difficult to answer without considerable background in geology.
>
> — Martin Gardner, *Fads and Fallacies in the Name of Science*

6.1 Introduction

In the context of this thesis, George McCready Price's position differs substantially from the other key role players. Ellen White, Uriah Smith, and Alonzo Jones were, for varying periods, leading figures in the Seventh-day Adventist Church. They contributed to the geology-Adventism interaction during the second half of the nineteenth century. Price, on the other hand, was neither a leading elder, an editor, nor a member of the core church organisation and his contributions to the engagement process took place during the early part of the next century. Price never was an officially appointed spokesperson for the Adventist church, but rather a church member, author, and educator that took up the views of Ellen White and other elders and applied them to the fields of evolution and geology. Nonetheless, considering the use people have made of Price's work, one gets the impression that it was perceived by many as the official Adventist position towards geology and evolution during the first half of the twentieth century. The Adventist Pacific Press Publishing Association was one of the prime publishers of his books, cementing the idea that he was Adventism's spokesperson. From early on the addition of a Publisher's Preface to his first book showed the strong endorsement of Price's views by the Adventist publishing editors.

The focus of this chapter will be the geological context of Price's arguments. This is particularly so of his articles. While his books have been frequently noted as a bridge

between Ellen White's Creation and Flood visions and the blossoming of twentieth century creationists, his geological articles in Adventist magazines have gone largely unnoticed and certainly no attempt has been made to connect them with his first books. The timing and the content of the early geological articles at the beginning of his writing career provide a further opportunity to trace the development of his arguments during this formative period. The aim of this chapter is to evaluate Price's geological arguments. Price was, and still is, highly appreciated by Adventist readers who feel that he has provided them with tools to counter evolutionist ideas that, they feel, have threatened their core belief system. It has become increasingly evident, however, that Price's geological arguments were highly flawed from a geological perspective.

This chapter will trace how geological thought became part of his life and created the opportunity for him to extend his influence over the engagement between geological and Adventist thought. An analysis of his geological books between 1902 and 1923 and journal articles from 1902 through 1905 will trace the unfolding of his key geological arguments. A discussion of his major influences will lead to conclusions concerning his important role in the thought engagement.

Price's Geological Status and his Position Within Adventist Thought.

George McCready Price has been variously characterised as an amateur, self-taught and armchair geologist. He showed some ambivalence in his own perception of his status. Although initially admitting that he was not a geologist, it was only a decade later that he awarded himself the accolade of "Professor of Geology." What is a geologist? Was McCready Price a geologist? It can be said that a geologist is a person who specialises in geologic research and study.[1] Others describe it as "the scientific study of the origin, history, and structure of the earth."[2] Alternatively, one could say a geologist is someone who studies the earth, rocks, and processes that form the earth. It has also been pointed out that geologists study the nature, composition and structure of the earth in order to locate materials and minerals, and are professionals that are involved in the increase of scientific knowledge concerning the earth. Invariably the definitions point to the physical investigation of earth materials and processes. Many nineteenth century geologists developed their skills through an apprenticeship with practically skilled geologists. Certainly during the nineteenth and most of

1. Random House Kennerman Webster's College Dictionary, 2010.

2. Online FreeDictionary.

the twentieth century geology remained a field-oriented science.[3] Raab and Frodeman discuss the complex nature of fieldwork and note the fact that geological data collection includes a 'bodily experience' in which the very concepts used in geology are grounded. Becoming an experienced geologist involves the development of a sense of geological time and its implication for appreciating spatial relations in the earth's crust.[4] The role of a geologist has substantially changed from being a purely fieldwork-based scientist as in the nineteenth century. Nowadays, to become a geologist, geology graduate students typically undertake extensive field and laboratory investigations and learn to communicate their findings in reports and journal articles. Geology has become such a varied, and multi-disciplinary subject that not all geologists are involved in physical fieldwork anymore, and geology is increasingly based on computer analysis of satellite imagery, and physical and chemical laboratory analyses.

Even by nineteenth century standards Price would certainly not have been considered a geologist. He knew a little geology but was certainly not a practising or professional geologist. Being an amateur geologist normally involves at least collecting rocks, minerals, fossils and/or gems. Price did not qualify. His biographies do not report any such activities. Without evidence of any field-related experiences Price can indeed, at best, be characterised as a self-taught, armchair geologist. His knowledge came from textbooks that he read, but there was no practical component involved. He, therefore, missed the synthetic skill set that is developed by fieldwork training and experience. He did not 'think' like a professional geologist and his geologically "naive criticism," marked by inexperience and simplistic interpretations would bring him to wildly unscientific conclusions such as his "*Law of Conformable Stratigraphical Sequence*."[5] Price's Adventist readership was not truly aware of his limited geological training and simply trusted his superficial geological arguments. As his readership over time extended beyond Adventist circles, his arguments found fertile ground with those looking for an uncomplicated confirmation of their strict literalist interpretation of Scripture.

There is no doubt that Price's influence stretched far beyond his authored books; his influence can still be felt in most recent Creationist thinking. Weinberg labels him within this

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3. Thomas Raab and Robert Frodeman, "What is it like to be a geologist? A Phenomenology of Geology and its Epistemological Implications," *Philosophy & Geography* 5, no. 1 (2002): 73.

4. Raab and Frodeman, "What is it like to be a geologist?" 75, 77.

5. Martin Gardner in *Fads and Fallacies in the Name of Science* talks about Price's 'naive criticism of strata chronology' (e-book loc. 2293 of 6822); Price, *The Fundamentals of Geology*, 119.

context, as the "godfather of the modern creationist movement."[6] Francis Nichol, Ronald Numbers, Rodney Stiling, and Warren Johns are among some authors who have endeavoured to position Price within the context of the long-term engagement between geological and orthodox Christian thought, as discussed below.

The Seventh–day Adventist Bible Commentary characterises the period from 1850 to 1900, prior to Price, as the 'theological phase' of Adventist Flood geology. This was a period in which "science was seen as a tool used by those seeking ways of escaping from God as Creator and Lord."[7] In the context of the Two-Book paradigm, when considering the unchanging standard of the Bible, the word of infidel scientists was not to be trusted. Evidence of this can be found in the many articles published in the major Adventist periodicals during this period. The editors played a major role in choosing articles to be published in line with Adventist theology.

McCready Price's work signals, according to the editor(s) of the *Adventist Bible Commentary*, the start of the 'scientific phase' of Adventist Flood geology. Price felt the need to halt the Protestant move toward accepting theistic evolution and therefore challenged the churches to a new reformation by returning to the truth of creation. The *Bible Commentary* authors emphasise that Price's influence within the Adventist church was (and probably still is) substantial. Many Adventists started to regard him as practically inspired and any disagreement with Price would be seen as "a heretic to the truth of God."[8]

According to Numbers, Price was strongly influenced by Ellen White's descriptions of the Edenic beginning of the world and the impact of the Flood waters. Especially her suggestion that the deluge and related events had buried the fossils intrigued Price. It was, in particular, the aura of authority surrounding Ellen White's words which convinced Price to frame his findings of historical geology within her word picture. Numbers labels Price's work a "scientific version" of Ellen White's views which Price variously called, 'the new catastrophism,' 'the new geology,' or 'flood geology.'[9] Price totally accepted Ellen White's geologically outdated description of how buried coal beds were responsible for earthquakes

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6. Carl R. Weinberg, " 'Ye Shall Know Them by their Fruits': Evolution, Eschatology, and the Anticommunist Politics of George McCready Price," *Church History* 83, no. 3 (September 2014): 685.

7. Francis D. Nicol, ed., "Genesis and Geology," *The Seventh-day Adventist Bible Commentary*, vol. 1 (Hagerstown, MD: Review and Herald, 1978), 73.

8. Ibid.

9 Ronald L. Numbers, "Creating Creationism: Meanings and Uses since the Age of Agassiz," in *Evangelicals and Science in Historical Perspective*, ed. David N. Livingstone, D. G. Hart, and Mark A. Noll (New York: Oxford University Press, 1999), 237.

and volcanoes.[10] Even in his 1923 textbook, *The New Geology*, he still pointed to the connection between the burning coal beds and volcanic action.[11] Throughout his career, Price continued to show an unquestioning belief in the authority of Ellen White's words. Thus Price acted as the conveyor of her thoughts into the new century and well beyond.

Warren Johns has traced the early influences of British scriptural geologists on the development of Price's thoughts. Johns astutely describes the change that occurred in the geological interpretation of what deposits were ascribed to the Flood by British scriptural geologists. Prior to the acceptance of the reality of the occurrence of an ice age, the scriptural geologists generally agreed that the entire fossiliferous part of the geological column was formed by the Flood. As evidence for the ice age strengthened during the mid-nineteenth century, the British scriptural geologists increasingly limited the action of the Flood to just "the superficial gravels, loams and erratic blocks, accompanied by the bones of mammoths, mastodons, rhinoceroses, and even humans."[12] The next few decades saw a further diminishing influence of the Flood in explaining the body of fossiliferous formations. Price had, for example, used the British scriptural geologist George Fairholme's earlier writing from 1833 to support the idea that the Flood formed all the entire fossiliferous geological column.[13] However, in 1833 Fairholme had mistakenly placed the great coal beds *above* the 'chalk beds' of the Cretaceous. By 1837, Fairholme had corrected this by moving the (Carboniferous) coal beds to a position below the Cretaceous chalk beds. The implication was that the coal beds were now considered to be antediluvian, having been formed *before* the Flood.

This diminishing influence of the Flood in explaining geological phenomena by British scriptural geologists was not acceptable to the nineteenth century North American scriptural geologists. To counter the diminishing Flood trend, Price attempted to eliminate, or at least to greatly downplay, any concept of an ice age, "the great nemesis of scriptural geology."[14] The American scriptural geologist Martyn Paine had previously labelled the

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10. Ronald L. Numbers, *The Creationists: From Scientific Creationism to Intelligent Design*, expanded ed. (Cambridge, MA: Harvard University Press, 2006), 90.

11. George McCready Price, *The New Geology: A Textbook for Colleges, Normal Schools, and Training Schools; and for the General Reader* (Mountain View, CA: Pacific Press, 1923), 690. The connection had become less upfront but was still unmistakably there.

12. Warren H. Johns, "Scriptural Geology, 1820-1860: An Essay and Review," *Origins*, number 62 (2008): 45-6.

13. Johns, "Scriptural Geology," 45.

14. Ibid., 46.

introduction of the Ice Age theory as an intentional 'invention' by the professional geologists to do away with the Flood as a geological agent.[15] In this respect Price felt greatly supported by the writings of Henry Howorth on the 'Nightmare of the Ice Age.'[16] Strictly following Ellen White's depiction of the Flood, Price continued to interpret *all* fossiliferous rocks as caused by the Flood and at the same time denied any evidence of a fossil-based succession of life in the geologic column. Warren Johns sees in this a major difference in interpretation between the British scriptural geologists and Price.[17] Price categorically rejected the reality of any fossil-based geological sequence. Fossils were, according to him, only helpful in taxonomically grouping the various life forms and had no chronologically-tagged meaning.

Stiling has labelled Price's 'Flood Geology' as the "echo of scriptural geology" and claims that Price embraced Ellen White's published account of her vision of the Genesis Flood and blended this extra-biblical revelation with scriptural accounts and his interpretations of geological texts in his version of "Flood Geology."[18] While there are some similarities between British scriptural geology and Price's geological writings, Stiling finds no hard evidence of a 'genetic'[19] relationship between British scriptural geology and Ellen White's and Price's geological writings.[20] The biggest difference between the two is, according to him, that before Darwin's *Origin of Species*, British scriptural geology contended for the reputation and integrity of a literal, non-figurative biblical textural interpretation. After Darwin, Price's *Flood Geology* became a weapon against the new threat

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15. See Rodney L. Stiling, "The Diminishing Deluge: Noah's Flood in Nineteenth-Century American Thought" (PhD Diss., University of Wisconsin-Madison, 1991), 178. Stiling gives several references from Martyn Paine, e.g. *Physiology of the Soul and Instinct*, 429, see also 661.

16. George McCready Price, *The Fundamentals of Geology and Their Bearings on the Doctrine of a Literal Creation* (Mountain View, CA: Pacific Press, 1913), 195.

17. Stiling, "The Diminishing Deluge," 54.

18. Rodney L. Stiling, "Scriptural Geology in America," in *Evangelicals and Science in Historical Perspective*, ed. David N. Livingstone, D. G. Hart, and Mark A. Noll (New York: Oxford University Press, 1999), 187.

19. Ellen White's and Price's approach to geology had been influenced by but was not borne from British scriptural geology. Stiling explained that he had only noticed a circumstantial 'phenotypic' resemblance between American flood geology and the scriptural geologists, but could not find any 'genotypic' or stronger textual connection. He had observed however a very strong resemblance between Ellen White and Price's flood geology accounts and the writing of the Lord Brothers and Martyn Paine. Stiling wondered whether there could have been plagiarism involved.

20. Warren Johns contended this. Johns mentioned that Price communicated that he had, at least, the works of the scriptural geologists Granville Penn (1825, 2vols.) and George Young (1838) in his personal possession. Warren H. Johns, "Scriptural Geology, 1820-1860: An Essay and Review," *Origins* no. 62 (2008): 59, endnote 43; Price also referenced Fairholme in connection with his Fact Number Two in *Fundamentals of Geology*, 74. The link with the scriptural geologists may have been stronger than had been suggested by Stiling.

to faith: evolutionary theory.[21] The nature and longevity of the strong connection between Ellen White's metanarrative of the Genesis Creation and Flood accounts and Price's new geology is a major point of investigation in this chapter.

6.2 Relevant Life Experiences

Price's early life was characterised by substantial hardships until he established himself in his late-thirties, through hard work and sheer persistence, as an Adventist creationist educator and author.[22] The basic story of George McCready Price's life has been told in Clark's *Crusader for Creation* and has further substantially been augmented by material from robust research by Ronald Numbers resulting in the many excellent book chapters, journal articles and other papers on the topic.[23] In this section, only information relevant to Price's published writings in the field of geology is presented within the main documented experiences in his life.

6.2.1 Early Canadian Experiences Towards his First Published Book

Price was born in 1870 on the family farm twenty-five miles west of Moncton, New Brunswick province, Eastern Canada. After his father had died, he started at a young age selling religious books for financial support. Through his mother, Susan McCready, Price accepted the Adventist doctrines and became interested in Adventist publications. After finishing high school and continuing to sell religious books, he enrolled at Battle Creek College in Michigan at the age of twenty-one.[24] While enrolled at Battle Creek College he had access to library and course books which included the scriptural geologist David Lord's *Geognosy* as well as to recent and past issues of the *Review and Herald* and *The Signs of the Times.* Furthermore, there was an opportunity to meet up with Elder Uriah Smith, who had regularly edited material on geology in the *Review and Herald*. Smith was at that time a Bible teacher at the College (until 1892). Additionally, around the same time, Alonzo Jones was connected with Battle Creek College as an invited lecturer. There is, however, no recorded

21. Stiling, "Scriptural Geology in America," 187-8.

22. Toward the end of the 1906 school year, Price, aged 36, was asked to take over Professor W. E. Howell's classes in Latin and Greek at the medical college in Loma Linda. His career abruptly changed from being the handyman-in-general at the educational institution to becoming Professor in Latin and Greek; Harold W. Clark, *Crusader for Creation: The Life and Writings of George McCready Price* (Mountain View, CA: Pacific Press, 1966), 30-1.

23. See Ronald L. Numbers, *Darwinism comes to America* (Cambridge, MA: Harvard University Press, 1998), 100-10; Ronald L. Numbers, *The Creationists*, (2006 edition), 88-119.

24. Clark, *Crusader for Creation*, 13.

evidence that exposure to writings on the engagement between geology and orthodox Christianity, nor chance encounters with Smith or Jones, directly influenced his later choice to address geology and faith issues as a career. It is not impossible though that whilst at Battle Creek College a first seed was planted which sprouted some years later when strongly confronted with the evolution theory.

Despite ongoing testing life experiences while being a colporteur, he managed to enroll for a one-year teacher training course at the Provincial Normal School of New Brunswick in 1896. There, he received his only and very brief formal science training in a few science courses which included some mineralogy. The next year, he accepted his first small-town teaching position. Two years later, at the age of twenty-seven, he became a teacher in the remote village of Tracadie on the Gulf of St. Lawrence. In Tracadie, he met Dr Alfred Corbett Smith (1841-1909) whose influence proved extremely formative for his later career. Corbett Smith, with a Harvard Medical School academic education, challenged Price's thinking concerning the theory of evolution. Price seriously struggled to harmonise Ellen White's metanarrative of the Creation days and the Flood with Corbett Smith's views on evolution. It was through that encounter that he discovered the relationship between rock strata and fossils. Numbers describes Price's discovery as follows:

> Only after poring over the standard geology texts and "almost tons of geological documents, government reports, memoirs, and monographs on special geological topics" did he discover "how the actual facts of the rocks and fossils, *stripped of mere theories*, splendidly refute this evolutionary theory of the invariable order of the fossils, *which is the very backbone of the evolution doctrine*."[25]

Nothing in Price's biographies indicates that, prior to those experiences in Tracadie, he had read material from other Adventists concerning the relationship between geology and evolution. Intrigued by the geology-evolution connection, Price eagerly continued to peruse more books and geological reports on the topic in depth. By the time that he left Tracadie, in the spring of 1902, he had finished a manuscript for *Outlines of Modern Christianity and Modern Science* and had posted it to the Pacific Press Publishing Association in Oakland, California. The book was prepared for publication in 1902.[26] Price rewrote three excerpts

25. Numbers, *The Creationists*, 92. This quote includes quoted material from Price, *Genesis Vindicated,* p. 300; Price, "Some Early Experiences," p. 80, as cited in *The Creationists,* p.463.

26. George E. McCready Price, *Outlines of Modern Christianity and Modern Science* (Oakland, CA: Pacific Press, 1902).

from the book into articles which appeared during the first half of 1902 in *The Signs of the Times,* which was published by the same Adventist organisation.

6.2.2 Struggle for Employment and Eventual Recognition

Despite many disappointing employment experiences as an Adventist evangelist, principal of a local academy, an attempted literary career in New York City, and a job of driving a team of horses, Price managed from late 1904 to early 1905 to prepare nearly twenty weekly episodes of an "Evolution and Geology" article series to be published in *The Signs of the Times.*[27] After arriving in Oakland, California in the fall of 1905, his life started to follow a more positive course. The physical proximity to the magazine editors encouraged him to write four more geological episodes for his "Evolution and Geology" series to be published in *The Signs of the Times* around October and November 1905.

In 1906 he eventually managed, at the age of thirty-seven, to self-publish, with his mother's maiden name (McCready) as a middle name, his second book, *Illogical Geology, The Weakest Point in the Evolution Theory*.[28] Unable to find a publisher, he took out a costly and burdensome loan to publish it. Finally, a more positive and long-lasting phase in his life started with the opportunity of a temporary lectureship at the newly organised Loma Linda College of Evangelists. From 1906 to 1938 and onwards he would remain involved with Adventist education at various colleges, during which time he wrote many of his books dealing with evolution and geology.[29] Price received, as a reward for his rigorous self-study and his authored books, a BA degree from Loma Linda College in 1912 and an MA degree from Pacific Union College in 1918.[30]

6.3 Price's First Book

During his long life, Price produced more than 40 books and wrote around 350 articles mainly for Adventist journals.[31] His first books did not have a wide circulation

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27. Numbers, *The Creationists*, 94-5.

28. George McCready Price, *Illogical Geology, The Weakest Point in the Evolution Theory* (Los Angeles, CA: The Modern Heretic Company, 1906). Price adopted his mother's last name as his middle name.

29. Numbers lists his academic appointments from 1907 to 1938 in note 22, p. 465 of the expanded ed. of *The Creationists.*

30. According to information contained on the front page of the George McCready Price Papers held at the library of Andrews University. Numbers reports that The Loma Linda College of Medical Evangelists awarded him a B. A. based on his "Authorship" and independent study. Numbers further suggests that his M. A. was a gift from the Adventist Pacific Union College. See Numbers, *The Creationists*, 107 and 467.

31. The number of books and articles is based on Gary Shearer's bibliography of George McCready Price, http://library.puc.edu/heritage/bib-GMPrice.html (accessed July 30, 2016).

beyond Adventist readership but through sheer persistence, that changed with the publication of his major textbook, *The New Geology*.

6.3.1 Outlines of Modern Christianity and Modern Science (1902)

In his first book Price covered a variety of aspects related to evolution including philosophical, biological, and geological aspects.[32] His geological chapters dealt with such topics as the fallacy of the perception of the earth as a cooling globe; volcanic action and the causes of earthquakes; the scheme of evolutionary geology; the uncertainty of geological conclusions; and circular reasoning. Price aimed to counter the "uncertain, contradictory theories of a sick, halting theology,"[33] (presumably the increasingly popular 'theistic evolution'). More specifically it was felt by the Adventist publishers that belief in "deductions and inductions of the hypothesis and reasonings of science" was threatening Christianity.[34] The tone of the Preface reflected Ellen White's earlier warnings in *Spiritual Gifts*. She had spoken in this respect of "infidel suppositions" and that "men, with their vain reasonings . . . should not rest their faith upon mere suppositions."[35]

Reasons for Writing 'Outlines of Modern Christianity and Modern Science' (1902)

In his introduction Price outlines that the book was to be an alternative to the many books on theistic evolution that were being published. He suggests a return to primitive Christian principles at a time when theistic evolutionists were trying to reconstruct the current system of Christian theology. In reaction to this trend, he thought that Lyell's and Agassiz' uniformitarian geology and indeed the "whole fabric of modern geology" were, therefore, due for reconstruction. Out of all geologists, Price would frequently target Charles Lyell and his uniformitarian hypothesis. He even dedicated a special chapter to 'Lyellism' in one of his later books.[36] Price suggests that it was especially Lyell who drove the development of the new geology. This perception has proven to be a myth. Historians have shown that from the wider European perspective, geology would not have been much different without Lyell's influence (see remarks from the geological historian Ellenberger in chapter 2). Convinced that the book of nature and the written Word share the same Author and "shed light upon

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32. Clark, *Crusader for Creation*, 17.

33. Price, *Outlines of Modern Christianity*, v.

34. Ibid., iv-v.

35. Ellen G. White, *Spiritual Gifts*, vol. 3 (Battle Creek, MI: Seventh-day Adventist, 1864), 95.

36. George McCready Price, *A History of Scientific Blunders* (New York: Fleming H. Revell, 1930), 119-123.

each other," Price feels that the known facts of science when separated from its theories, would be better explained by the Mosaic account of Creation and the Deluge.[37]

Outlines of Modern Christianity and Modern Science can, therefore, be seen as Price's foundational statement against evolutionary thinking and the promotion of a return to belief in the fiat creation of the earth and the changes brought about by the Genesis Flood. Although already clearly identified, geology had not yet fully become his decisive tool to impoverish evolutionary theory. His leaning on Ellen White's narrative of the Creation days and the role of the Flood is abundantly obvious within the text (see Table 6.1). It is evident that the discussions with Alfred Corbett Smith in Tracadie had encouraged him to read more about evolutionary theories and to start writing on the dangers of evolutionary science. The impact of those strong influences led Price to identify geological reasoning as the 'Achilles heel' of evolution, and this became an important motivation for writing his first book and the start of his writing career.

Outlines would set the basic framework for his later anti-evolutionary writings. It contained an underlying set of ideas that he would frequently revisit. *Outlines* was not just about modern science but also addressed the wider impacts of evolution on society. Weinberg identified two major focus points in *Outlines*. The first focus point was evolutionary geology. Weinberg retold the story of how, during his stay in Tracadie, Price suddenly came to understand that geologists used circular reasoning to determine the age of rock layers. It became clear to Price that the geologists' argument was based on pure assumption and was "utterly incapable of any rational proof."[38]

The second focus point that Weinberg identified was Price's concern with the moral and political consequences of evolutionary science.[39] Weinberg sees in Price's writing a distinct link between Adventist theology and his moral and political critique of evolution.[40] When dealing with moral aspects of evolutionary theory, Price states: "It is rightly considered that the supreme test of any doctrine, religious, social, or scientific, is its bearing upon life and human action; 'Ye shall know them by their fruits.' What are the fruits of the evolution

37. Price, *Outlines of Modern Christianity*, ix-xi.

38. Ibid., 137.

39. Carl R. Weinberg, "'Ye Shall Know Them By Their Fruits': Evolution, Eschatology, and Anticommunist Politics of George McCready Price," *Church History* 83, no. 3 (September 2014): 694-5.

40. Weinberg, "'Ye Shall Know Them By Their Fruits," 695.

theory?"[41] Evolution, according to Price, is ultimately "utterly subversive of civil and religious liberty for the individual."[42] Price identifies a direct link between evolution and the (then) current world problems. He would warn the readers that "a religio-political despotism is the outcome of the evolution theory."[43]

Ellen White's Influences

Ronald Numbers claims that Ellen White's "authoritative descriptions of time past made most Adventists, including Price, unwilling to entertain interpretations of Genesis, such as the day-age and gap theories, that allowed other fundamentalists to accommodate the findings of historical geology."[44] Whilst other fundamentalist religious organisations would accept ways to accommodate the findings of professional geologists, it was through the inspired, authoritative narratives of Ellen White that Seventh-day Adventists were unable to do so. Price declared himself particularly taken by Ellen White's "revealing word pictures of the Edenic beginning of the world, of the fall and the world apostasy, and of the flood."[45] Apparently, it was especially her suggestion that the deluge had caused the burial of the fossils that intrigued Price and caused him to look for possible explanations that could help to refute the invariable order of the fossils as the backbone of the evolution doctrine.[46] Price would eventually reject the geological column because he thought it represented a purely artificial arrangement of rock layers and a phenomenal scientific blunder.[47] His carefully reasoned arguments with a veneer of remarkable geological sophistication would over time convince thousands of Protestant fundamentalists. Martin Gardner astutely states, "So carefully reasoned are Price's speculations, so bolstered with impressive geological erudition, that thousands of Protestant fundamentalists today accept his work as the final word on the subject. Even the skeptical reader will find Price difficult to answer without considerable background in geology."[48]

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41. Price, *Outlines of Modern Christianity*, 234.

42. Ibid., 252.

43. Ibid., 269.

44. Numbers, *The Creationists*, 90.

45. George McCready Price, *Genesis Vindicated* (Takoma Park, Washington D. C.: Review and Herald, 1941), 300.

46. Ronald Numbers, *The Creationists*, 92.

47. Price, *New Geology*, 676.

48. Martin Gardner, *Fads and Fallacies in the Name of Science* (New York: Dover Publications, 1957), ePublication, pp. 186-7 out of 542.

In his *Outlines* Price would use many recognisable elements from Ellen White's descriptions of what happened 'After the Flood' (see Table 6.1). Of significance is the fact that at the end of Chapter VII, of his *Outlines* entitled, "Despairing Darwinism", Price pasted a sizeable, although unreferenced, quote from Ellen White's *Great Controversy*:

> The finite minds of men are inadequate fully to comprehend the plans and purposes of the Infinite One. We can never by searching find out God. We must not attempt to lift with presumptuous hand the curtain behind which He veils His majesty. The apostle exclaims, 'How unsearchable are His judgements, and His ways past finding out!' We can so far comprehend his dealings with us, and the motives by which He is actuated, that we may discern boundless love and mercy united to infinite power. Our Father in heaven orders everything in wisdom and righteousness, and we are not to be dissatisfied and distrustful, but to bow in reverent submission. He will reveal to us as much of His purpose as it is for our good to know, and beyond that we must trust the Hand that is omnipotent, the Heart that is full of love.[49]

This appears to be the only occasion that Price directly quoted Ellen White in his geological books. In his subsequent books on Flood geology, aimed at wider audiences beyond Adventist readership, he would no longer make reference to Ellen White or her writings.

The Geological Chapters in Outlines of Modern Christianity and Modern Science

Price paid special attention to the relationship between geology and the evolution theory. His view was that if geology cannot prove that there actually had been a succession and general progress of life on earth, then any discussion about the origin of species becomes useless.[50] The title of his next book would emphasise this perception: *Illogical Geology: The Weakest Link in the Evolution Theory*. From then onwards it became his focus to reconstruct modern geology into biblical geology, a form of geology that rendered the evolution theory invalid. Chapters IV through VI of *Outlines* dealt with geological issues as they were an important part of Price's argument concerning the impact of the evolution theory on our world (and are the main concern of this study).

Price was convinced that both the nebular theory and the concept of a gradually cooling globe (as discussed in Chapter IV, "*Molten though Rigid*") were false because they conflicted with the literal facts that the Bible provided.[51] The Bible states in Genesis 1: 1 that, "In the beginning God created the heaven and the earth." There is, therefore, for him, no

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49. Price, *Outlines of Modern Christianity*, 233.

50. Ibid., 200.

51. Ibid., 110-1.

Table 6.1 Parallels between aspects of Ellen White's Flood vision and Price's *Outlines of Modern Christianity and Modern Science*

***Spiritual Gifts*, vol. 3 [SG, III] (1864); *Patriarchs and Prophets* [PP] (1890), Ellen White.**	***Outlines of Modern Christianity and Modern Science* (1902), Geo. E. McCready Price**
The coal and oil frequently ignite and burn beneath the surface of the earth. Thus rocks are heated, limestone is burned, and iron ore melted. The action of the water upon the lime adds fury to the intense heat, and causes earthquakes, volcanoes, and fiery issues. (SG, III, 108)	We have in the subterranean burning of vast coal and oil deposits a full and complete explanation, as it seems to me, of all earthquake or volcanic phenomena ... (p. 104) The action of some large quantity of water suddenly breaking in upon this mass of lime and melted ore would be like a blow upon nitro-glycerine. To say nothing of the heat, which would, if possible, be increased in fury, . . . (p. 106)
At this time [the Flood] immense forests were buried. These have since been changed to coal, forming the extensive coal beds that now exist, and also yielding large quantities of oil. (SG, III, 108) Everywhere were strewn the dead bodies of men and beasts. The Lord would not permit these to remain to decompose and pollute the air, . . . A violent wind which was caused to blow for the purpose of drying up of the waters, moved them with great force, in some instances even carrying away the tops of the mountains and heaping up trees, rocks, and earth above the bodies of the dead. (PP, 107)[52]	. . . some cause, at some time, buried vast forests deep beneath the surface of the ground in almost every quarter of the globe. (p.104) Submerged forests are found in almost every part of the world, . . . (p. 157) . . . *the greatest elemental disturbance which this world ever saw* took place at the close of the long period of submergence, . . . (p.158) . . . one of the chief purposes effected by this cosmic storm . . . to cover up these decaying bodies everywhere floating about, and keep them from polluting the whole air with their foul stench. (p. 161) . . . all these deposits were laid down at that universal churning up of the soil of the ancient world, The Noachian Deluge. (p. 174)
Coal and oil are generally to be found where there are no burning mountains of fiery issues. (SG, III, 80)	. . . those countries most subject to earthquakes, and having their surfaces dotted with fire-belching volcanoes, are countries *where practically no coal is to be found*. (p. 104)
Water and fire under the surface of the earth meet. (SG, III, 79) Water in the bowels of the earth gushed forth, . . . 9SG, III, 82)	We also know that beneath the surface in very many parts of the world there are even now extensive subterranean fires, . . . (p. 99) There are also doubtless vast underground reservoirs of water in almost every part of the globe, . . . (p. 107)
But the infidel supposition that the events of the first week required seven vast, indefinite periods for their accomplishment, strikes directly at the foundation of the Sabbath of the fourth commandment. (SG, III, 91)	[The interpretation of the days of creation as long periods of time] . . . strikes at the very basis of the Sabbath. (p. 125)

52. This quote by Ellen White reflects the same thinking as Martyn Paine in *Physiology of the Soul and Instinct, as distinguished from Materialism* (New York: Harper & Brothers, 1872), 662, 671. See especially Appendix III: "The Coal-Formations" (pp. 654-707). This is an extended version of a section with the same name in "A Review of Theoretical Geology" of 1856. Ellen White's panoramic remarks on the rapid and violent recession of the Flood waters show great resemblance to Paine's 1856 observations on the coal formations (see chapter 4, pp xx in this thesis). Martyn Paine, "A Review of Theoretical Geology," *Protestant Episcopal Quarterly Review, and Church Register* 3, no. 2 (April, 1856): 161-281. Martyn Paine highlighted the rapidity with which the waters are said to have *returned* from off the earth and the violence of their recession as compared with the more gradual progress of the rise of the waters.

doubt that the six literal days of creation "begin with the whole body of our world already in existence."[53] Price emphasises that,

> No believer in the Sabbath as the divine memorial of creation's week will hesitate to give as the distinct, positive teaching of Genesis that life has been on our globe only some six or seven thousand years; and that the earth as we know it, with its teeming animal and vegetable life, and man as the crowning work of all, was brought into existence in six literal days; and let scientists overthrow it if they can.[54]

Price clearly echoes Ellen White's reminder to keep the Sabbath day holy; to be aware of the infidel suppositions of geologists; that the earth is no older than six to seven thousand years; and that the earth was created in six literal days.[55]

Price, like Ellen White, continues to adhere to antiquated seventeenth century theories of the interplay between subterranean fire and volumes of water as the cause of mountain building, volcanoes, and earthquakes (see Table 6.1). Following Ellen White's narratives of the Creation days and the Flood, Price was convinced that "beneath the surface of the earth in very many parts of the world there are even now extensive subterranean fires."[56] As to the cause of earthquakes, he likewise points to the burning of vast coal fields deep beneath the ground.[57] Like Ellen White, he also points to the explosive effect of large quantities of subterranean water coming into contact with limestone and melted ore found adjacent to the coal. Oblivious to the well-documented historical progression of geological thought, Price did not 'understand' why geologists 'strangely' *overlooked* this as a cause for earthquakes and volcanoes.[58] His advice was that geologists should keep facts and theories entirely distinct and should not spin theories about their facts.[59]

Price next continues to show that 'popular' geology rested on very uncertain data and that the arguments of geology and evolution constituted 'reasoning in a circle.'[60] Similar arguments had been discussed by David Lord in his *Geognosy*, which had been a prescribed

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53. Ibid., 112.

54. Ibid., 113.

55. White, *Spiritual Gifts*, 90-1.

56. Price, *Outlines of Modern Christianity*, 99.

57. Ibid., 104.

58. Ibid.

59. Ibid., 114.

60. Ibid., 130-1. Similar arguments had been discussed by David Lord in his *Geognosy* (1850s) and Alonzo Jones in his series of geology and evolution articles in the *Review and Herald* and *The Signs of the Times* (1883-5).

textbook at Battle Creek College during Price's brief stay there. Convinced that geology undermined "modern orthodox Protestantism," he labels geology as "the last great stronghold of anti-biblical science" that has been "the principal cause of the development of 'Higher Criticism'."[61] Price was confident that geology had simply assumed a succession of life on the globe and that this assumption had become the main point to establish the evolution theory. Evolution should, therefore, be "ruled out of court on the ground of collusion between the witness and the defendant."[62]

Convinced of the uncertain nature of geology, Price examines its stratigraphic foundation: the geographic formations or sets of rock layers. He argues that formations could not be used to represent successive eras in the world's geological history. Stratigraphical evidence based on the comparison of rocks from different localities is, according to him, not reliable and he cited discordance between physical and palaeontological evidence. He quotes Nicholson on the fact that palaeontological evidence (fossil content) was more reliable than physical rock evidence (e.g. texture, grain size distribution, mineralogy).[63] Price presented evidence based on contextually isolated quotes from well-known geologists of the potential pitfalls with stratigraphic correlations. He ignores the fact that practicing geologists were aware of such dangers and that they had developed pragmatic protocols to avoid such obvious mistakes. Price is, nonetheless, convinced that the way that fossils evidence was used to tell the relative age of the strata was based on assumptions and not on facts. According to him, rock formations were fitted into a "hypothetical ladder of life," for which there was no evidence, but only pure assumption. Price states that the observed geological successions (Geological Column) already incorporated the "skeleton of the evolution theory," which had actually been taken for granted since the days of the famed French geologist Georges Cuvier (1769-1832).[64]

For Price, the Geological Column is "*just the taxonomic, or classification, series, a cross-section if you will, in the life of the antediluvian world*."[65] He made this judgement in *Outlines* based on fragmentary quotes of geologists without the many quoted stratigraphic

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61. Price, *Outlines of Modern Christianity*, 125-6.

62. Ibid., 131.

63. Ibid., 133; H. Alleyne Nicholson, *The Ancient Life History of the Earth: A Comprehensive outline of the Principles and Leading Facts of Palaeontological Science* (New York: A. L. Fowle, 1876), 40.

64. Ibid., 141.

65. Ibid., 138. Italics by Price.

reports and examples that he presented in his later works. For example, in *Illogical Geology* (1906) he would provide a more substantiated discussion of four principles or 'facts' that, according to him, clearly undermined the idea of an actual life succession. In *Fundamentals of Geology* (1913) he pursues the same trend and provides significantly more data to ultimately introduce his provocative new "Law of Conformable Stratigraphic Sequences."

As an alternative to the popular 'fanciful' geological theory, Price presents his version of Biblical geology. He envisages a catastrophic cause for the formation of the fossiliferous rock strata. He thinks it possible that through some astronomical or other causes, such as possibly the sudden shifting of the earth's axis, air and water were violently convulsed. The suggested correlation between the Flood and a change in the angle of the earth's axis was certainly not new and had already been proposed as early as the seventeenth century by such early savants as Robert Hooke (1635-1703), Thomas Burnet (1635-1715, and Edmond Halley (1665-1742).[66]

Price thinks that, as part of this catastrophe, antediluvian water vapour could have chilled and condensed in the atmosphere and could have contributed to the catastrophic Flood of Noah. To this, Price adds the importance of the 'latter wind,' mentioned in Genesis 8: 1, to pass over the earth for drying up the waters. Ellen White had similarly emphasised this important point in the formation of the fossiliferous rock strata.[67] Price believes that because of this cosmic storm, "*the greatest elemental disturbance which this world ever saw* took place at the close of the long period of submergence."[68] This provides, according to him, further evidence of the absurdity of the idea that the earth has a molten interior. The earth had to be solid throughout to withstand the tide-generating influences of the sun and the moon. Scriptural interpretation, therefore, argues Price, pointed to an aqueous and not an igneous origin of the earth.[69] The disturbance of the vast reservoirs of water hidden beneath the surface of the earth would have caused the Flood. This mechanism helped to explain, Price imagines, the occurrence of the high mountain ranges adjacent to the deepest part of the oceans. Price argues that the layers with different fossils could then be easily explained by

66. Rhoda Rappaport, *When Geologists Were Historians (1665-1750)* (New York: Cornell University Press, 1997), 118.

67. White, *Spiritual Gifts*, 77.

68. Price, *Outlines of Modern Christianity*, 158. Italics by Price.

69. Ibid., 159.

considering the "specific gravity" of the dead animals.[70] He hypothesises that the "smaller and more helpless animals" including "countless millions of fish and shellfish would have been the first victims.[71] "The larger animals and man would flee to the hilltops from the rising waters" and later be entombed. Interestingly, although being against the assumptions of the infidel geologists, Price equally moved here into the realm of hypothetic, very non-Baconian thinking.

Price finds evidence for his Biblical geology in fragmentary quotes from a range of scientists. Such fragments often appeared disconnected from the intended general context of the works quoted. For example, he quotes the leading palaeontologist and zoologist Alleyne Nicholson on a comment concerning the abundance of fossil whale bones in Alabama to suggest that the whales died in an unnatural way and that their bones were deposited during the final phase of the Flood.[72] Nicholson did *not* suggest in any way that the whale bones accumulated by a major catastrophe such as a universal Flood but Price thought the quote supportive for his purpose. Similarly, Price quotes the preeminent professor of palaeontology, O.C. Marsh, on the abundance of the fossil remains of *Oreodontidae* (an extinct sheep-sized ruminant) around the borders of the North American lake-basins.[73] Whereas Marsh intended to indicate their chosen habitat, Price sees this as an attempt to explain away the fact that it was actually an example of a catastrophic deposit. These two examples showed the great length to which Price went in finding support for his theory by citing authorities, even though he had to use statements out of their intended context. He used a forensic search method to sustain his case rather than creating a balanced perspective of the facts to draw scientific conclusions. In a similar context, David Starr Jordan likens Price's style of writing to "a sort of a lawyer's plea."[74]

Price also considered the observed breaks in fossil occurrences between geological periods. He labels these as notorious and mysterious breaks. Sudden appearances and disappearances of fossil remains are for him not indicators of geological ages but rather

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70. Ibid., 160.

71. Ibid.

72. Ibid., 161; Alleyne Nicholson, *The Ancient Life History of the Earth: A Comprehensive outline of the Principles and Leading Facts of Palaeontological Science* (New York: A. L. Fowle, 1876), 300.

73. Price, *Outlines of Modern Christianity*, 161-2; O. C. Marsh, *Introduction and Succession of Vertebrate Life in America* (New Haven, Conn.: Tuttle, Morehouse, and Taylor, 1877), 39.

74. Letter from David Starr Jordan to George McCready Price, May 5, 1911; Ronald Numbers, *Darwinism Comes to America* (Cambridge, MA: Harvard University Press), 101.

"taxonomic classifications in the life-forms of *a complete world that has disappeared from view*."[75] Price states that to the 'believer in Genesis' the fossils are all contemporary with one another.

He then contrasts the Biblical antediluvian uniformity of climate with evidence of huge temperature variations associated with the Ice Age suggested by modern nineteenth century geologists. He did not see the need for such huge variations in order to explain fossil remains. Price follows his usual investigative approach for finding textual evidence from professional authorities to throw doubt on the evidence of ice ages. He mines James Geikie's *The Great Ice Age* for useful problematic issues concerning evidence of glaciers over Europe and other parts of the globe.[76] Price concludes that it seems better to substitute *water* for *ice* in the text and to just believe that the 'glacial' deposits "were laid down at that universal churning up of the soil of the ancient world, the Noachian Deluge."[77] Although by the end of the nineteenth century the occurrence of the Ice Ages was no longer doubted by practicing geologists, Price continued to find support for his ideas in the works of such controversialists as Henry Howorth (1842-1923) and his books: *The Mammoth and the Flood*, *The Glacial Nightmare and the Flood*, and *Ice or Wate*r.[78] Howorth was a British conservative politician, barrister and amateur historian and geologist.[79] Price indicates that he greatly enjoyed reading Howorth's arguments with the outcome being Price's works show many parallels with these arguments.[80] Howorth's methods of research were deemed 'forensic' (argumentative) rather than methologically scientific. He searched, like an advocate, for facts to sustain his case rather than to concentrate on presenting a complete perspective. He favoured citing authorities with this forensic intent and made uncritical use of quotations. His reviewer thought that he was a better destroyer of hypotheses than a constructor when it came to

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75. Price, *Outlines of Modern Christianity*, 167. Italics by Price.

76. James Geikie, *The Great Ice* Age (London: Edward Stanford, 1894). James Geikie was a successful Scottish geologist and a younger brother to Archibald Geikie.

77. Price, *Outlines of Modern Christianity*, 174.

78. Henry Howorth, *The Mammoth and the Flood: An Attempt to Confront the Theory of Uniformity with the Facts of Recent Geology* (London: Low Marston, Searle, and Rivington, 1887); Henry Howorth, *The Glacial Nightmare and the Flood: A Second Appeal to Common Sense from the Extravagance of some Recent Geology*, 2 vols. (London: Sampson Low, Marston and Co., 1892); Henry Howorth, *Ice or Water: Another Appeal to Induction from the Scholastic Methods of Modern Geology* (London: Longmans and Green, 1905).

79. "Obituary: Sir Henry Howorth, A Life of Wide Interests, Politics, Science and Art," *The Times* (July 17, 1923): 14.

80. Price, *Outlines of Modern Christianity*, 175. Footnote 23.

replacing the ice-sheet with the deluge.[81] Both Howorth and Price stated that they favoured pure induction over the fanciful hypotheses and theories of modern geologists. They differed however in their views of the universality of the Flood. While Price favoured a complete deluge, Howorth thought that considerable areas of the world escaped the flood from which man, animals and plants spread out again.

As Numbers has noted, Price was a voracious reader of geological literature.[82] In *Outlines,* Price cited a variety of literature (books and magazines) which showed that, even then, he was extensively searching for support of his ideas. For example, he mentioned reading *Bible, Science, and Faith* from the Roman Catholic Professor J. A. Zahm (1851-1921) who, although sympathetic towards the descriptive aspects of evolution, appealed strongly against Darwin's theory of natural selection.[83] Through reading Zahm's work, Price had become familiar with Henry Howorth's *Glacial Nightmare.*[84] Price would frequently reference the well-known and respected harmonising geologists, John William Dawson (1820-1899) and James Dwight Dana (1813-1895). Dropping the names of such authorities and making it appear that they were in support of his arguments undoubtedly impressed readers with no access to, or knowledge of the original works. Dawson was a distinguished Canadian professor of Geology who, next to his scientific works, wrote several books on the harmony between science and religion. He adhered to a day-age creationist view but spoke strongly against Darwin's theory of evolution. Some of his harmonising books were frowned upon by his scientific peers. Dana was a highly esteemed American geologist and professor of Natural History and Geology at Yale College.

6.4 Price's 1902-1905 Articles in the Seventh-day Adventist Journals

Significantly, it was through the magazine articles that Price reached the major segment of Adventist believers possibly more extensively than through his books. Although Price sent his first article to the *Review and Herald,* his early contributions from about 1902 to 1905 in *The Signs of the Times* are of special interest because they comprise his thoughts during a transition period (see Appendix B). This phase covered the interval between

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81. See T. G. Bonney, "Review: Ice or Water. Another Appeal to Induction from the Scholastic Methods of Modern Geology. By Sir Henry H. Howorth, K.C.I.E., D.C.L., F.R.S. In three volumes. Vols. i and ii. (Longmans, 1905)," *Geological Magazine* 2, no. 6 (June 1905): 278-9.

82. Numbers, *Darwinism Comes to America*, 101.

83. J. A. Zahm, *Bible, Science, and Faith* (Baltimore: John Murphy, 1894)

84. Price, *Outlines of Modern Christianity*, 175. Footnote 23.

publishing his first, more general, book on the dangerous impact of evolutionary thinking on Christian society and issuing his second book that focused specifically on exposing geology as the weakest link in the evolution theory. While his books were increasingly written with a wider Christian audience in mind, the magazine articles were aimed directly at Adventist readers with the important end-time message in mind. The articles appear to have a more introductory approach than his books (e.g. "XI. Some Geological Definitions").[85]

Price's first contribution to the Adventist magazines was an article entitled, "Some Scrap Quotations," which editor Uriah Smith, towards the end of his career, published on November 1, 1901, in the *Review and Herald*. Price used the opportunity to announce his imminent first book and its topic. He asked the editor for a corner in the journal for the exchange of ideas regarding geological changes that had taken place at the Flood as alluded to in chapters 7-9 of Ellen White's *Patriarchs and Prophets*.[86] The particular target of his endeavours were evolutionists and evolutionary geology. Price's aim was to develop a message, "which calls upon this age of evolutionists to 'worship Him that made heaven, and earth; and the sea, and the fountains of waters'; a message which brings to us the Sabbath as a souvenir of creation and creation's God, and thus an everlasting protest against the fashionable evolutionary geology."[87]

Price quotes part of the first angel's message in Revelation 14:7 and suggests, through a parallel verbal phrase, a link with the fourth commandment in Exodus 21:11. The phrase 'heaven, and earth; and the sea' occurred in both verses. Price, in a very concise form, points here to a link between protology and eschatology as had been earlier alluded to by Ellen White in *Spiritual Gifts*. She had used a comprehensive description of the Flood based on her panoramic vision, to help people imagine the terrible conflagration that will befall the earth shortly before the Second Coming of Christ.

6.4.1 The 1902 Articles

Three articles appeared at irregular intervals between mid-January and mid-August 1902. All three were linked to the content of his 1902 publication *Outlines of Modern*

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85. George McCready Price, "XI. Some Geological Definitions," *Signs of the Times* 31, no. 7 (February 15, 1905): 104-5.

86. Only towards the end of 1904 would his appeal for a 'regular corner' regarding a discussion of the relationship between geology and the biblical Flood become reality. It would however be in *The Signs of the Times* and not in the *Review and Herald*. This shows the important influence editors have on the placement of articles and the issues discussed.

87. Geo. E. McCready Price, "Some Scrap Quotations," *Review and Herald* 78, no. 47 (November 19, 1901): 747.

Christianity and Modern Science. Since Wilcox was the editor of both the Pacific Press Publishing Association and of *The Signs of the Times*, the associated publication of the articles and the book is easily understood. The articles provided an opportunity for the regular readers to be made aware of the perceived infidelity that was harboured in the theories of evolutionists and geologists.

The title of the first 1902 article, "Darwinism at its Last Gasp," related to a book review in the "Nature" magazine of November 28, 1901, and dealt with various perceptions that existed for the term *Darwinism*.[88] During the 1880-1930 time frame, there existed a lack of unanimity among scientists regarding *how* evolution had occurred. Darwinian natural selection as a paradigm appeared temporarily on the decline. Neo-Darwinians and Neo-Lamarckians debated the possible causes of evolution during this period. Price's assessment of the whole debate was that it was "just a little family quarrel as to *just how* the settled fact of organic evolution has really come about."[89] The Darwinism discussion had also been included in *Outlines,* but he took the opportunity here to link it to a recent article he had read.[90] His brief remarks concerning the Darwinism debate showed that Price was well informed about trends in science through the popular scientific magazines that he regularly perused.[91]

His main point of interest remained, however, the connection between geology and evolution. He informs his readers that,

> … geologists do not *prove* this succession of life, as most people suppose, but they *only assume it* as a working hypothesis, And it is unnecessary to show that this succession-of-life idea is only the skeleton of the evolution theory, and that to quote geology in favour of evolution is only reasoning in a circle.[92]

It is interesting to note that this quote contained some familiar elements that had already been raised by Alonzo Jones in 1885: the emphasis on assumptions; the dependency of evolution on geology; and the circular reasoning argument.

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88. Geo. E. Price, "Darwinism at its Last Gap," *Signs of the Times* 28, no. 3 (January 15, 1902): 37; Book review of Dr Stölzl's, "Truth and Error in von Kölliker," *Nature* (November 28, 1901): 76-7.

89. Price, "Darwinism at its Last Gap, 37.

90. Price had discussed the Darwinism debate in Chapter VII of *Outlines*.

91. For example, Price quotes *Nature* (November 28, 1901): 76-77.

92. Price, "Darwinism at its Last Gap," 5; Similar material is found in Chapter V Geological Guessing, *Outlines*.

In the two later 1902 articles Price pays attention to recent archaeological finds which, it was claimed, provided evidence for the presence of man alongside extinct animals.[93] He is convinced that there was definite evidence that man lived side by side with animals that geologists had indicated were extinct long before man appeared. This shows, according to him, that the limitations of Darwin's theory were indeed gradually being exposed. Price writes:

> It was long a cardinal doctrine of their "science" that the fossils belonged to ages long before man came on the stage of action; that even the "latest" of them, those huge creatures of the olden time, the megatheriums, mammoth, etc., were extinct long before man was created. . . . That man lived side by side with many of the fossil animals is now everywhere acknowledged.[94]

The many cited works of varying nature in Price's early writings testify that he continually searched for useful pieces of information from which to build his Flood geology theory. On one occasion he found a portion of valuable information on the evidence of submergence in Sir John William Dawson's (1820-1899) writings.[95] Dawson was a highly esteemed Canadian professional geologist who had written many scientific works but who had also maintained a strong passion for harmonising geology with the Genesis narratives. Dawson had remained convinced that drift ice in the flooded St Lawrence River valley had been the principal agent of glacial action, and he, therefore, refused to believe the more generally accepted theory of a greatly expanded ice cap covering the northern parts of America and Europe during the Ice Age.[96] Ultimately, with Dawson's death, his submergence and ice-carrying theory as the cause of glacial deposits and landforms came to an end.[97] Nonetheless, for Price, this contained information he could use for his Flood geology theory.

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93. This material does not appear so extensively in *Outlines*. These are later additions.

94. Geo. E. McCready Price, "Pictures Older than the Flood. Witnesses of God," *Signs of the Times* 28, no. 32 (August 6, 1902): 498.

95. In his first book, *Outlines of Modern Christianity and Modern Science* (1902), Price used several snippets of information from Dawson's *Acadian Geology* (1868), *Origin of the World, According to Revelation and Science* (1877); *Modern Ideas of evolution, as related to Revelation and Science* (1891); and *The Meeting-place of Geology and History* (1894), to scaffold his flood geology theory.

96. John William Dawson, *Acadian Geology, the Geological Structure, Organic Remains, and Mineral resources of Nova Scotia, New Brunswick, and Prince Edward Island* (London: Macmillan, 1868): 64-65.

97. During his lifetime Dawson wrote 350 scientific works and moreover a number of popular Christian works on science and the Bible. As a devout Christian, he was seen by many as a defender of Christianity against agnostic or even atheistic science. However, not everyone agreed with his views as expressed in his popular works and during the later decades of the 19th century a younger generation of scientists felt that those writings damaged Dawson's scientific reputation. Dictionary of Canadian Biography Online, 1891-1900 (volume XII). http://www.biographi.ca/009004-119.01-e.php?id_nbr=6059. Accessed November 23, 2012.

Evidence of antediluvian man, discovered through cave paintings in the south of France, proved for Price that man was a contemporary of the mammoth and the reindeer. This confused Price when he tried to combine this with evidence that the tropical to semitropical lion, hyena, and hippopotamus at some time lived in great numbers in England. Moreover, if there was no Flood, how can the presence of those animals be reconciled with an Ice Age? He reflects:

> How, then, could these animals have lived in these northern countries – for England has about the same latitude as Labrador – when the larger part of the North Temperate Zone is said by the geologists to have been covered with glaciers all the year round? The thing is almost too absurd for discussion. No, we have abundant evidence, from the fossils as well as from the Bible, that in those antediluvian days a nearly uniform climate of spring-like loveliness spread all over the earth… Certainly, with semi-tropical shell-fish in the seas, there is no room for their imaginary ice-sheets down to the sea-level in both Europe and America.[98]

It seems obvious to many that the mammoth and reindeer did not visit England at the same time as the lion and the hippopotamus, since the former indicate arctic-like conditions and the latter more tropical conditions. However, because Price does not believe in the occurrence of an Ice Age, he interprets them all as animals that lived there prior to the Flood. He therefore naively states:

> All talk about a "mammoth age" and a "reindeer age" succeeding one another, is absurd; for we not only find their bones together over great regions of country, but here on the walls of these caves their pictures are drawn true to life by the same artists, showing that man and these animals lived here together. … we see that this out-of-date system of uniformitarian geology has been fooling us all these years by trying to cover up the evidence that the world that then was, being overflowed with water, perished. 2 Peter 3: 6.[99]

Price stresses here again that by introducing an Ice Age geologists were only trying to cover up evidence of the Flood. The confusing situation causes Price to conclude that, "to people of plain common sense this whole science of geology seems sadly out of joint with this age of hard scientific facts."[100]

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98. Geo. E. McCready Price, "Pictures Older than the Flood. (Concluded) Discoveries in the South of France," 516. From the 1840s onwards professional geologists became convinced, on the basis of mounting evidence, that what was earlier on seen as indicators of a global flood actually was a deposit from one or more Ice Ages. Changing climates would have left behind fossils of a variety of animals and scientists were just coming to terms with this.

99. Ibid., 517.

100. Ibid.

The material in his articles of an archaeological nature were additions to what was contained in *Outlines*. It is evident that Price had specially prepared the material for the Adventist magazine. With simple illustrations of the cave paintings and the use of subheadings in the text, Price made the material easy to digest for the readers of *The Signs of the Times.* The 1902 articles did not yet contain any material on Price's perceived flaws in stratigraphical geology. That would only start to appear during the latter part of his series of articles during 1904-5 when the preparations for his next book, *Illogical Geology*, were more advanced.

6.4.2 His 1904-05 Regular "Evolution and Geology" Contributions

In the years between his first articles on geology and evolution in 1902 and his regular pages in 1904-5, Price received several endorsements from the editor of *The Signs of the Times* for his first book *Outlines of Modern Christianity and Modern Science* and promotions for his regular contributions to the journal.[101] Clearly Milton Wilcox, as leading editor, supported Price's venture and was probably in regular communication with him. The 1904-05 issues of *The Signs of the Times* started in late November 1904 with regular weekly episodes written by Price under the umbrella 'Evolution and Geology.'

The 23 articles appeared between November 1904 and November 1905 (see Appendix B). The first group of articles originated from *Outlines* and the remainder from documents Price had ready for his forthcoming *Illogical Geology.* The material was either reworked material or near-verbatim copies of chapters of his books. The information that he chose from *Outlines* dealt largely with the problems created by evolutionary science, while the latter articles, based on *Illogical Geology*, dealt more with his perceived flaws in geological reasoning. His last episodes included brief sketches of such well-known geologists as Werner, Cuvier, Smith, Lyell, and Hutton. Price briefly characterised each of the geologists based on the use of their assumptions, premises, and speculative theories. He concluded that they all had wandered from true scientific methods and that instead they should have followed a proper common sense inductive method of reasoning.[102]

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101. "Have you read it?" *Signs of the Times* 30, no.3 (January 20, 1904): 48; "Evolution and Geology," *Signs of the Times* 30, no. 14 (April 6, 1904): 224.

102. George McCready Price, "Historical Sketch (Concluded.) James Hutton," *Signs of the Times* 31, no. 48 (November 29, 1905): 760.

The many referenced quotes show that Price closely followed Von Zittel's *History of Geology* as the sole source for his information.[103] Again, there is evidence that Price tenaciously searched the book for useable fragments. While most of the material used came from the book's beginning, he found, for example, a remote sentence near the end of the book on the incompleteness of the geological column as it pertained to the "Transitional" series below the Carboniferous rocks.[104] He used von Zittel's quotes to support his fixed ideas about the uncertainty of the geologists' data and their use of circular reasoning as he had previously outlined in his chapter on "Geological Guessing" in *Outlines*.[105] In his later chapter, "History of the Idea," in *Illogical Geology*, he would augment those arguments with references from Archibald Geikie's *Founders of Geology*.[106] When considering the entire 1904-05 series of episodes on "Evolution and Geology," it becomes evident that Price's emphasis had progressively shifted from the general topic of evolution theory to the perceived flaws of geology. He would pursue that new focus for most of his further life.

Price became a prolific writer and his 1902 and 1904-05 series of articles in *The Signs of the Times* were only the beginning of a massive onslaught of articles that he produced between then and the 1950s. Pacific Union College librarian Gary Shearer's bibliography of George McCready Price lists a total of almost 350 periodical articles more or less related to the topic of evolutionary geology, of which 225, or 65%, would eventually find a place in *The Signs of the Times*.[107] The greater part of the other 35% appeared in the *Review and Herald* and other Adventist periodicals.

6.5 His Subsequent Geological Books

Price's 1902-1905 articles provide deep insight into the transition from his earlier thoughts on the influence of evolution on society towards his genre of books that focused more clearly on presenting geology as the weakest link in the evolution theory.

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103. Karl A. von Zittel, *History of Geology and Palaeontology to the End of the Nineteenth Century*, trans. Maria M. Ogilvie-Gordon (London: Walter Scoot, 1901).

104. von Zittel, *History of Geology*, 432.

105. Price, "Geological Guessing," *Outlines of Modern Christianity and Modern Science*, 123-53.

106. Price, "History of the Idea," *Illogical Geology*, 14-19; *Archibald* Geikie, *Founders of Geology*.

107. For a list of books and articles see "Price, George McCready," Bibliography by Gary Shearer, http://library.puc.edu/heritage/bib-GMPrice.html (accessed July 30, 2016).

6.5.1 Illogical Geology (1906)

Illogical Geology formed the true beginning of Price's career in declaring modern geology as the weakest point in evolution theory. This happened to coincide with the start of a more positive phase in his life with ongoing employment in Adventist education. With *Illogical Geology* Price started a more focused approach towards reconstructing modern geology into his intended version of biblical geology. The deconstruction of modern geology unfolded through the exposure of perceived flaws in its stratigraphic foundations. Convinced of the uniqueness of his approach, Price considered *Illogical Geology* to be the only known English geological work that is not cosmogonic [theoretical] in nature. His goal was to prove beyond any possible doubt that with the absence of fossil evidence for a life succession, the earth was created by a direct act of God and that the earth experienced a tremendous catastrophe a few thousand years ago.

Objectives of Price's Illogical Geology

Illogical Geology was especially aimed at readers dissatisfied with the role of geology as used in biological science. Convinced that there was "something wrong with the Evolution Theory," Price had stumbled upon the "weakness of the geological argument," and had therefore decided to further analyse the foundational facts of geology.[108] This time, he did not again restate his underlying conceptual beliefs in the formation of the earth based on Ellen White's metanarrative. He approached the perceived weakness of evolutionary theory from the supposed fragile basis of geological reasoning. For this, he sets out to test the validity of the historical succession of life as taught by modern geology. Price confidently phrases the basis of his argument as follows:

> If there is no positive evidence that certain types are essentially older than others, if this succession of life is not an actual scientific fact, then Darwinism or any other form of evolution has no more scientific value than the vagaries of the old Greeks – in short, from the standpoint of true inductive science it is a most gigantic hoax, historically scarce second to the Ptolemaic astronomy.[109]

In appreciation of Henry Howorth's analogous viewpoints towards modern geology, Price places a quote from the preface of Howorth's *The Glacial Nightmare and the Flood* on the very title page of *Illogical Geology*. The quote reads: "It is a singular and a notable fact,

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108. George McCready Price, Preface to *Illogical Geology: The Weakest Point in the Evolution Theory* (Los Angeles: The Modern Heretic Company, 1906).

109. George McCready Price, Introduction to *Illogical Geology*: *The Weakest Point in the Evolution Theory* (Los Angeles: The Modern Heretic Company, 1906).

that while most other branches of science have emancipated themselves from the trammels of metaphysical reasoning, the science of geology remains imprisoned in '*a priori*' theories."[110]

McCready Price financed and distributed privately around 500 copies as a trial edition for examination and criticism among geologists, other scientists, and clerics within the USA and England.[111] For this, he borrowed money which apparently left him in debt for many years.[112] By the time he published his second book, he had just established himself on the American West Coast. This greatly facilitated his contacts with the editors of *The Signs of the Times* who were also domiciled in the West.

The Influence of Herbert Spencer's "Illogical Geology" (1859) Essay

Herbert Spencer (1820-1903) was an old-style polymath, influential British philosopher, biologist, anthropologist, and sociologist. He firmly supported the evolution theory and after reading Darwin's *Origins* actually had coined the well-known phrase "survival of the fittest."[113] Spencer wrote his "Illogical Geology" essay as an armchair philosopher's analysis of reasoning used in geology during the first half of the nineteenth century. Spencer intended to investigate the perceived inconsistency in the philosophy of geologists as it related to the evolution theory.[114] He felt that during the 1850s the notion of geological catastrophes – "the sweeping away of the old organic types and the creation of a new set" - was still too common and "repugnant" to him.[115] He believed that it was necessary that the reasoning that led to such a conception needed to be examined. From his analysis, Spencer concluded that geological evidence did not warrant such a notion of the necessary destruction of previously existing inhabitants of the earth and the creation of different, new inhabitants. While he understood the mechanisms for the occurrence of breaks in the geological record, he did not accept its association with actual new creations of life forms on the surface of the planet.

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110. George McCready Price, title page of *Illogical Geology;* Henry H. Howorth, Preface to *The Glacial Nightmare and the Flood: A Second Appeal to Common Sense from the Extravagance of Some Recent Geology*, vol. 1 (London: Sampson Low and Marston, 1892), vii.

111. George McCready Price, *The Fundamentals of Geology: And their Bearings on the Doctrine of a Literal Creation* (Mountain View, CA: Pacific Press, 1913), 7.

112. Clark, *Crusader for Creation*, 22.

113. Herbert Spencer, *The Principles of Biology* (London: Williams and Norgate, 1864), 444.

114. See David Duncan, *The Life and Letters of Herbert Spencer* (London: Williams and Norgate, 1911), 553.

115. Ibid.

Spencer was convinced that the geologists were still too "catastrophic" in their thinking as evidenced by the names they used suggesting sudden disappearance of previously existing inhabitants and the new creation of a different class of inhabitants. He felt that the terms Palaeozoic, Mesozoic, and Cainozoic indicated three successive systems of life.[116] To him illogical geology related to adherence to catastrophic thinking. Spencer felt that the catastrophic notion in Werner's geological scheme of Primitive, Transition, Secondary or Stratified, and Alluvial or Tertiary Series, was still influencing mid-nineteenth century geological philosophy. He wonders: "Though the onion-coat hypothesis [of Werner] is dead, its spirit is still traceable, under a transcendental form, even in the conclusions of its antagonists?"[117] Although philosophically it may have been an interesting issue, there is no record of contemporary geologists extensively responding to Spencer's rhetorical thoughts. The 'onion-coat' hypothesis[118] phrase was hardly ever used among professional geologists, but for Price, it was a useful naïve term. He used the phrase pejoratively to downplay the pioneering work of Abraham Gottlob Werner (1749-1817) and, in general, to ridicule the theories of the geologists. It is interesting to note that Price found inspiration for his book in the writings of an evolutionist like Spencer. This became part of his *modus operandi*. Price was always looking for statements from well-known scientists to support his arguments, even (or maybe especially) when their known viewpoints were contrary to his own.

Through his essay, Spencer showed that he had not studied the contributions of the original authors but relied on interpretations by others. The negative attitude towards the work of Werner had been instigated by Charles Lyell in *Principles of Geology*.[119] Spencer may not have been aware that Lyell - as later outlined by Rudwick - had distorted and oversimplified the theories of his predecessors (including Werner) to indirectly target the speculations of the British scriptural geologists of his own time.[120] Spencer had written "Illogical Geology" because he thought that contemporary geologists such as Roderick Murchison and Charles Lyell were "unconscious apologists for a philosophy that displayed

116. Herbert Spencer, "Illogical Geology," *Universal Review* (July, 1859): 76.

117. Ibid., 66.

118. Unconventional phrase used to give an oversimplified and unrealistic picture of rock formations as formed in uniform successive and continuous layers around the earth.

119. Charles Lyell, *Principles of Geology: Being an Attempt to Explain the Former Changes of the Earth's Surface, by Reference to Causes now in Operation*, vol. 1 (London: John Murray, 1830), 56-9.

120. Martin J. S. Rudwick, "Introduction to a facsimile of Charles Lyell's volume 1 of *Principles of Geology"* (Chicago: University of Chicago Press, 1990), xvi-xvii.

the tendencies of a Neptunist theory that they had already discarded."[121] It appears that Lyell (and Spencer) had failed to make a distinction between Werner's Neptunist's thoughts and the improvements that Werner had made to a generic scheme for organising rock formations. Werner's practical rock formation classification was based on earlier schemes from continental European savants linked with the geological succession that he had observed in the region where he lived. At one time Werner defended the intentions of his classification by stating,

> I have focussed my sole attention on the various large rock masses, as far as these can be observed, of which nature has built our solid earth; on the search for their essential differences, based on their mode and time of formation; and on the classification and characterisation of these differences according to the nature of these rock masses.[122]

Spencer's ideas on different environmental settings to the present world distribution of continents and oceans differed from the approach of the geologists. Spencer thought it unscientific to argue that when a particular type of life existed on the earth, no other could exist at the same time. Looking at the present world configuration, he argued that many types of life should be contemporaneous.[123]

Professional geologists, however, pragmatically recorded the rocks and their characteristics as they observed them in the field. They documented gaps in the stratigraphy of rock formations as they had observed them. They proved open to the possibility of different configurations of continents and oceans in prior times and understood the fragmentary nature of the geological record. This is where the thinking of theoretical philosophers and practicing field geologists differed substantially. The field experience inherently included the constant weighing of hypotheses concerning many variables, as well as the three-dimensional relations of the rock strata within different spatial settings, whether near or far. Without training and extensive practice in field mapping it becomes very difficult to understand and correctly critique the geologists' thinking.

Price as a self-taught armchair geologist likewise perceived geology quite differently from the professional practitioners. Price was looking for flaws in the geologists' reasoning to argue for the *absence* of evidence for a succession of fossil life and justification for *one*

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121. Mark Francis, *Herbert Spencer and the Invention of Modern Life* (London: Routledge, 2007), 331-2.

122. Abraham Gottlob Werner, *Short Classification and Description of the Various Rocks (1786)*, facsimile, with translation and introduction by Alexander M. Ospovat (New York: Hafner, 1971): 19.

123. Clark, *Crusader for Creation*, 23.

ultimate catastrophic event, the Noachian Deluge. Geology, according to Price, follows an "illogical and wholly unscientific procedure" and uses "hasty conclusions based on wholly insufficient data."[124] He wonders whether "this whole idea of there (sic) having really been a succession of life on the globe was not only *not* proved by scientific methods but that it was essentially improvable and absurd?"[125] Price does not discuss the entire context of Spencer's essay but lifts out of it quotations that are useful for his specific purpose. Price, for example, quotes Spencer in *Illogical Geology* on Werner's perceived shortcomings as a geologist, "Thus on a very incomplete acquaintance with a thousandth part of the earth's crust, he based a sweeping generalisation applying to the whole of it."[126] Price also uses the simplistic 'onion-coat' term as he had found it in Spencer's essay, "Must we not say that though the onion-coat hypothesis is dead, its spirit is traceable, under a transcendental form, even in the conclusions of its antagonists."[127] Price's aim was to show that 'illogical' geology was the weakest link in the evolution theory because it cannot scientifically prove that there has been a true succession of life. For this he found useful arguments in Spencer's essay. Because Price did not read the original works of Werner he would perpetuate flawed arguments.

Price's Use of Authoritative Textbooks

Price searched reputable textbooks to get a better understanding of the historical development of the idea of the succession of life forms among geologists. For this, he studied comprehensive historical treatises of the geology scholars Karl von Zittel and Archibald Geikie. This was a clear departure from his approach in *Outlines of Modern Christianity*. His focus had now shifted more firmly to modern geology to be used as a tool to render the idea of the evolution of life impossible. As alluded to earlier, the late nineteenth and early twentieth century historical geologists remained strongly influenced by Charles Lyell's version of the history of geology in his (1830-33) *Principles of Geology*. Especially their perception of Werner's geological ideas had been tainted by Lyell's cunning adaptation of history to present himself as the first geologist to approach geology on truly inductive terms, free from fanciful theories so typical of earlier geological thinking. When Price read von

124. Price, *Illogical Geology*, 12, 32.

125. Ibid., 13

126. Price, Illogical Geology, 11; Herbert Spencer, "Illogical Geology," 59.

127. Price, *Illogical Geology*, 12; Herbert Spencer, "Illogical Geology," 66.

Zittel and Archibald Geikie, he was unbeknownst to himself influenced by Lyell's far-reaching calculated intentions.[128]

At the start of *Principles*, Lyell had emphasised the importance of the use of *observed* modern causal agents and vowed to exclude speculations about the origin of the earth. In his version of the history of geology, he portrayed all his predecessors as not having been truly inductive in their approach. For this, he would distort facts and oversimplify their theories (and by implication also those of his contemporaries).[129] Abraham Gottlob Werner (1749-1817) was especially the object of Lyell's critique.[130] According to Lyell, Werner used sweeping generalisations; Werner's views of his contemporaries were prejudicial to the progress of geology; there were substantial errors in Werner's geology of his own country; his theory of basalt was extremely erroneous; and Werner's errors were adopted in England by his students.

Lyell's critique of his predecessors and contemporaries had infiltrated the authoritatively documented histories of geology by von Zittel and Archibald Geikie. Those that relied on these historical works, including Price, received a slanted version of the actual history of geology. Price argues that because Werner's notion of the organisation of the rock strata is tainted, the life succession theory was consequently invalid.[131] According to Price, this is because the followers of Werner had not been following true inductive methods, and they developed their geology by hypotheses instead of by observed facts. Price uses the following quote from Geikie's *Founders of Geology* to attach Geikie's stamp of authority:

> But never in the history of science did a stranger hallucination arise than that of Werner and his school, when they supposed themselves to discard theory and build on a foundation of accurately-ascertained fact. Never was a system devised in which theory was more rampant; theory, too, unsupported by observation, and, as we now know, utterly erroneous. Assumptions were treated as demonstrable facts. The very point to be proved was taken for granted, and the geognosts, who boasted of their

128. In this context Victor Baker's observation is worthy of note: "How interesting that Lyell, who many consider to be the greatest of the 19th century geologists, actually provided the inspiration through his logically flawed formulation of uniformitarianism for what eventually became creation science!" By focusing on Lyell's misunderstanding of induction, Price was able to present his case for "illogical geology" thereby influencing later arguments put forward years later in the name of creation science. Personal communication by email.

129. Martin J. S Rudwick, Introduction to a facsimile of Charles Lyell, xvii.

130. Alexander M. Ospovat, "The Distortion of Werner in Lyell's *Principles of Geology*," *British Journal for the History of Science* vol. 9 (1976): 190-8.

131. At times Price mistakenly mixes up the names of Cuvier and Werner. Price, *Illogical Geology*, 23.

> avoidance of speculation, were in reality among the most hopeless speculative of all the generations that had tried to solve the problem of the theory of the earth.[132]

It was this type of confirmation from an authority in the field of geology that provided Price with supposedly powerful ammunition for his deconstruction of modern geology. That there was a wider context to the story did not matter to him. The story would be retold in many of Price's subsequent geological works, and the gist of it would find its way into Whitcomb and Morris' *Genesis Flood*. Lyell's history of geology remained authoritative even among professional geologists until late in the twentieth century. Serious attempts to correct Lyell's picture have only been made since the 1960s and 1970s. As a consequence of this new analysis, there has emerged a much more complex and positive perception of Werner's role in the development of geological thought.[133]

Price's Four Facts and his Recognition of Geological Flaws

Price sets out to show systematically that geology cannot prove that there has been a succession of life in the history of the earth. He suggests that "the assumption that over the earth the fossils invariably occur in the particular order in which they were first found in a few corners of Western Europe" must be tested by the facts. The first step, according to Price, would be to find out how one can determine which are the absolutely oldest rock on the earth.

For this he constructs theoretical **Fact Number One**;

> *Any kind of fossil whatever, even 'young' Tertiary rocks, may rest upon the Archaean or Azoic series, or may themselves be almost wholly metamorphosed or crystalline, thus resembling in position and outward appearance the so-called 'oldest' rocks*.[134]

He built this fact up from two separate propositions that he lifted out of Dana's *Manual of Geology*. The first proposition was, "A stratum of one era may rest upon any stratum in the whole of the series below it."[135] Dana had listed this proposition as one of the difficulties that one may encounter in determining the true chronological succession. As a solution to solve such a difficulty Dana outlined a number of means of correlation with

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132. Archibald Geikie, *The Founders of Geology* (Baltimore: Johns Hopkins Press, 1901), 112. Lyell's voice is easily perceived in this quote.

133. See Roy Porter, *The Making of Geology; Earth Science in Britain 1660-1815* (Cambridge: Cambridge University Press, 1977); Rachel Laudan, *From Mineralogy to Geology: The Foundations of a Science 1650-1830* (Chicago, University of Chicago Press, 1987); Martin J. S. Rudwick, *The New Science of Geology: Studies in the Earth Sciences in the Age of Revolution* (Aldershot, Hampshire: Ashgate, 2004).

134. Price, *Illogical Geology*, 22. Italics added for emphasis.

135. James D. Dana, *Manual of Geology: Treating of the Principles of the Science with Special Reference to American Geological History*, 4th edition (New York: American Book Company, 1896), 399.

careful precautions to be followed.[136] Price failed to convey this to his audience. The second proposition was that "even the so-called 'youngest' rocks may be metamorphic and crystalline just as well as the 'oldest'."[137] For each proposition, a skilled field geologist would have no serious problem in working out the correct chronological succession. Price found the two propositions at separate places in Dana's *Manual,* and he combined the two isolated situations in formulating his highly unlikely, but not absolutely impossible scenario, Fact Number One. Price reasons, on the basis of this fact, that in such a situation "there is no way of proving what fossil was buried first."[138] He concludes that geologists that followed Werner's school were not following true inductive methods but followed the myth that "only certain kinds of rocks (fossils) are to be found at the 'bottom' or next to the Archaean."[139] This was a way of reasoning, according to Price, that took the very point to be proven for granted.

Designed **Fact Number Two**: "*Any formation whatever may rest conformably upon any other 'older' formation.*"[140]

The critical part in this fact is the term 'conformably'. Strictly speaking, a conformable contact suggests no break or hiatus in the continuity of the geological record. It suggests that the relative positions of the strata have remained undisturbed and no *significant* time gap or break in deposition is assumed to have occurred. In 1923, Price would introduce in *The New Geology* the term, *'deceptive conformity*', borrowed from William B. Scott.[141] Price omits to tell his readers that Scott also explained that meticulous examination of the

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136. The procedure to deal with difficulties in ascertaining the true chronological order such as checking the order of superposition (with several precautions outlined), examining the colour, texture, and mineral composition, checking for changes in mineral compositions in the strata over long lateral distances, and checking the fossil content for correlation (with several precautions outlined). Dana, *Manual of Geology*, 399-406.

137. Dana, *Manual of Geology*, 408; Price, *Illogical Geology*, 22.

138. Price, *Illogical Geology*, 23.

139. Ibid.

140. Ibid., 24. Italics added for emphasis. Price provided in a footnote in *Fundamentals of Geology* an interesting connection between his Fact Number Two and the British scriptural geologist George Fairholme. Price noted, "Over three quarters of a century ago this principle was recognised." He quoted Fairholme as having written, "I feel persuaded that there is no fact more clear in geology than this, viz. *that the upper surface of almost every formation was yet soft and moist when the superincumbent sediments were deposited upon it*" (italics by Fairholme). George Fairholme, *New and Conclusive Physical Demonstrations, both of the Fact and Period of the Mosaic Deluge, and of its having been the only Event of the Kind that has ever occurred upon the Earth* (London: James Ridgway, 1837), 397.

141. Price cited the American vertebrate palaeontologist Professor William B. Scott as the person who coined the phrase 'deceptive conformity'. Price, *The New Geology*, 620.

'deceptive conformity' in the Rocky Mountains had led to the recognition of the true nature of the contact and exposed the deception.[142] Scott provided examples of how the unconformity is normally detected. Indeed, with a perceived unconformable contact between lithologically similar layers, it is more complex, but *not* impossible, to determine the length of time that could have elapsed between the formations.[143] The true nature of the contact is often easily explained by following and scrutinising the nature of the contact between the layers, laterally, over greater distances.

Price showed his impressive forensic investigative skills by unearthing cases that seemed to support his interpretation of the principle. His quoted support from Darwin, Geikie, and Dana made it appear that significant chrono-stratigraphic gaps between conformable strata are more ubiquitous than admitted. Again, Price made exceptional situations appear more common than they really were. However, each case needs to be researched in-depth to establish the nature, context and evidence for the gap. Upon closer scrutiny, Price's examples appear to be what are now known as 'paraconformities.' A paraconformity, a term introduced by Duncan and Rodgers in 1957, is strictly speaking a type of ***un***conformity (a gap in the geological system).[144] With a paraconformity (see fig. 6.1,

142. William B. Scott, *An Introduction to Geology*, 2nd ed. (New York: MacMillan, 1919), 380-1.

143. Tomkeieff details how the significance of the concept of geological 'unconformity' developed over a substantial length of time. Steno was the first savant to graphically depict an unconformity in 1669 but did not discuss it. Hutton (1795) is known for identifying classical unconformities (e.g. Siccar Point in Berwickshire, UK), but the application of the term 'unconformity' had to wait for Jameson (1805) who translated the German term, '*abweichende lagerung*', introduced by Werner (1803). It was only during the 1840s that the term 'unconformity' was fully introduced into the science of geology. Identification of variations of the concept had to wait until the beginning of the twentieth century (Grabau, 1905). This example shows that many complex geological concepts cannot be attributed to just one person but developed from a dim beginning over longer periods of time and through the contributions of many people until its full recognition. See S. I. Tomkeieff, "Unconformity–An Historical Study," *Proceedings of the Geological Association* 73 (1962): 383-417.

144. Carl O. Dunbar and John Rodgers, *Principle of Stratigraphy* (New York: John Wiley & Sons, 1957), 117. Through systematically applying geological field skills and the use of laboratory analyses the true nature of the unconformity can be determined. Geologists normally investigate sedimentary, palaeontologic, and structural aspects of the unconformity. Sedimentary criteria include: evidence of subaerial features (e.g. basal pebble conglomerate, weathered chert, buried soil profiles) or evidence of submarine features (e.g. zone of glauconite, phosphate pebbles, manganiferous zones). Palaeontological discrepancies can be identified by searching for any juxtaposition of abrupt changes in faunal assemblages above and below the paraconformity. Structural criteria may include differences in the dip of strata above and below the plane of unconformity, and undulatory surface that cuts across bedding planes at the contact, truncation of dikes, or differences in complexity of fault systems above and below the unconformity. Above criteria are based on W. C. Krumbein and L. L. Sloss, *Stratigraphy and Sedimentation* (San Francisco: W. H. Freeman and Company, 1963), 308; John L. Roberts, *Introduction to Geological Maps and Structures* (Oxford: Pergamon Press, 1982), 218.

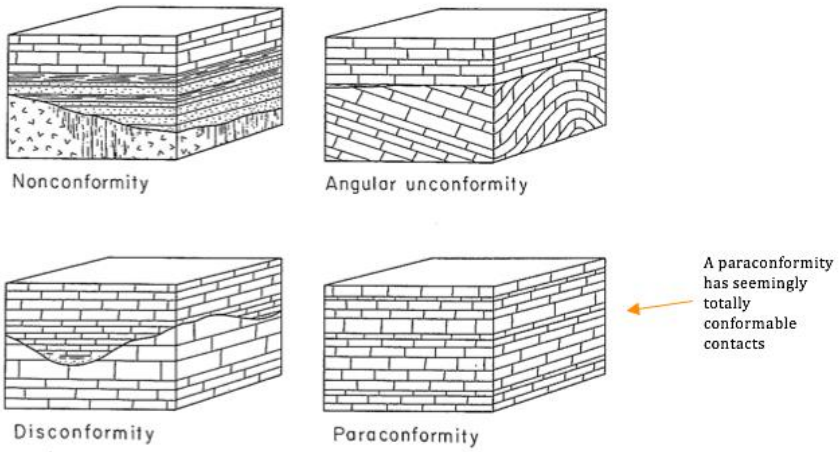


Figure 6.1. Four types of unconformity. *Top left:* nonconformity, separation between crystalline rocks and sedimentary rocks; *top right:* angular unconformity, horizontally parallel sedimentary strata deposited on tilted and eroded layers; *bottom left:* beds of the rock sequence above and below the unconformity are parallel to one another but separated by a disconformity surface indicating a period of non-deposition and/or erosion; *bottom right:* Paraconformity, gap in the geologic system with strata above and below the gap parallel without evidence of erosion. Paraconformity notation added to figure.

Source: Adapted from Carl O. Dunbar and John Rodgers, *Principles of Stratigraphy* (New York: John Wiley & Sons, 1957), 117.

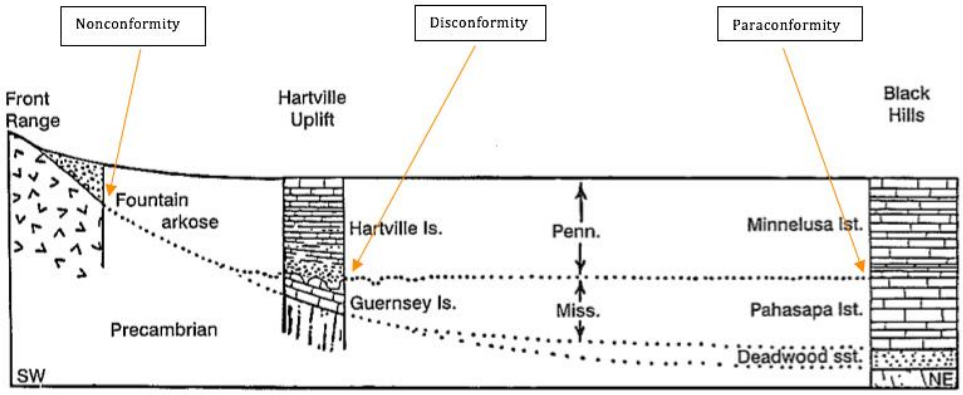


Figure 6.2. Lateral variability in unconformity between the Mississippian and Pennsylvanian systems. Schematic geological cross-section from the Front Range (Rocky Mountains) in southeastern Wyoming to South Dakota. Sideward transition between types of unconformity may assist in identifying a paraconformity. Unconformity labels are added for clarity.

Source: Adapted from *Carl O.* Dunbar and Rodgers, *Principles of Stratigraphy*, 122.

bottom right), there is no visible evidence of a gap in type because the strata above and below the gap are parallel, and there is no noticeable evidence of erosion. Laterally one type of unconformity may change into another (see fig. 6.2). Following a paraconformity laterally over greater distances may help to clarify the nature of the unconformable contact.

Through periods of non-deposition or erosion, there may be *substantial* gaps in time, and this constitutes a disconformity or parallel unconformity (paraconformity). For example,

in deep-sea deposits, such unconformities are known to occur because of suggested sea-level fluctuations and temporal sea current variations.[145] By connecting conformable contacts between rock strata with the possibility of the occurrence of large gaps in geological time, Price tried to diminish the geological time factor so that it became possible that all sedimentary rock strata were actually deposited in quick succession, at the time of the Noachian Deluge. Again, he emphasised the exceptional cases over the common situation. Such subtle nuances would have been difficult to detect by his readers who did not have any substantial skills in geology or the ability to research this for themselves.

When geologists are confronted with a paraconformity, where part of the geological column seems missing without any obvious signs of erosion, they investigate that contact to see how it changes laterally. They have a suspicion that locally certain strata are missing because such strata are present at other locations. By following the contact, they solve the 'enigma' of the paraconformity. An example of lateral variability in types of unconformity can be seen in figure 6.2. along the unconformable contact between the Pennsylvanian and Mississippian geological systems at the Hartville Uplift in Wyoming and the Black Hills in Dakota. Further to the west at the Front Range of the Rocky Mountains this contact changes into a nonconformity between the sedimentary rocks of Pennsylvanian System and underlying crystalline basement rocks.

The Hartville Uplift is a structural arch or crustal uplift related to the Black Hills uplift further east where tectonic forces have elevated deeper basement rocks. Such structures have created localised opportunities for episodes of non-sedimentation and erosion to occur. The basement uparching at the Hartville Uplift has, for example, resulted in an erosive contact between the Hartville and Guernsey formations which both contain sandstone (sst.), limestone (ls. or lst.), and shale (sh.) beds. At the Black Hills the uplift has resulted in a regional paraconformity [without immediate visual signs of unconformity] between the parallel strata of the Minnelusa limestone (lst.) and the Paha Sapa limestone (lst.) Formations. At the Front Range the contact developed into a nonconformity where Fountain arkose (a

145. Archibald Geikie, *Text-Book of Geology*, 842. Geikie listed a number of conditions that might cause such gaps; Paraconformities present interesting case studies for geologists. Rigorous analyses of stratigraphic and structural features lead to an improved understanding of such unconformable contacts. The Marshall Paraconformity, for example, has for years been the focus of ongoing geological research. The paraconformity is commonly identified as a Tertiary current-induced unconformity in the sedimentary sequence of the Canterbury Basin on the eastern margin of the South Island of New Zealand. Craig S. Fullthorpe, Robert M. Carter, Kenneth G. Miller, and Julia Wilson, "Marshall Paraconformity: A mid-Oligocene Record of Inception of the Antarctic Circumpolar Current and Coeval Glacio-eustatic Low Stand?" *Marine and Petroleum Geology* 13, no. 1 (1995): 61-77.

type of sandstone) of the Pennsylvanian System directly overlies crystalline basement rocks. The above example shows how complex isolated geological situations can be understood through rigorous regional fieldwork. While there may have been no obvious evidence of erosion at the Black Hills paraconformity, such evidence could be shown further to the west at the Hartville Uplift disconformity.

Price, without any fieldwork skill knowledge only considered isolated occurrences of seemingly normal contacts between parallel strata of a similar nature and without any further investigation quickly drew the conclusion that any formation whatever may rest *conformably* upon any other 'older' formation (his Fact Number Two). Price's hasty conclusion was driven by a desire to prove that there was no evidence of a succession of life in the sedimentary rocks. Professional geologists are trained to look for subtle indicators of erosion and/or non-deposition within a regional context to work out the nature of the contact. The ongoing research of the Marshall paraconformity in the New Zealand South Island and the adjacent Pacific Ocean is another example of how such paraconformities are slowly solved (see footnote 145 in this chapter).

Constructed **Fact Number Three**: 'Turned upside down', occurrences of fossils in reverse of the accepted order. Price summarises Fact Number Three as: *In very many cases and over many square miles of country these [stratigraphic] conditions are exactly reversed, . . . [but] appear to succeed one another conformably*.[146]

Again, Price quotes Geikie as an authoritative source for the statement, "We may even demonstrate that in some mountainous ground, the strata have been turned completely upside down, if we can show that the fossils in what are now the uppermost layers ought properly to lie underneath those in the beds below them."[147] Price dismissively notes that, "Some day, . . . a statement like this will be regarded as a literary curiosity."[148] Price omits to say that Geikie had carefully informed his readers that "Prolonged study of the succession of organic types in the geological past all over the world, has given the palaeontologists some confidence in fixing the relative age of fossils . . . [and that] distinctive fossils of a system or formation [have] been ascertained from a sufficiently prolonged and extended experience."[149]

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146. Price, *Illogical Geology*, 32. Italics added for emphasis.

147. Geikie, *Text-Book of Geology*, 837.

148. Price, *Illogical Geology*, 28.

149. It is noteworthy that here Price used the same author as did Alonzo Jones during his 1880s geology articles. They both made use of Geikie's *Text-Book*; Jones used the 1882, first edition and Price used the updated 1902, two-volume, fourth edition.

Price went on to cite several examples of upside-down sequences described by geologists as 'thrust faults' or 'overthrust faults.' One occurred in Alberta in the eastern Rockies, where Cambrian fossils are found above Cretaceous shale. Other well-known examples were located in the eastern parts of Tennessee in the Appalachian Chain, the Highlands of Scotland, the Rhine Valley, and the Alps in continental Europe. With some irony, Price quotes Geikie in saying that, "when a geologist finds things in this condition he may be excused if he begins to wonder whether he himself is not really standing on his head."[150] Struggling to comprehend sound physical evidence for the formation of such (for lay people still controversial) giant rock structures, Price naively (or mischievously?) concludes that it was the reverse order of the fossils that constituted the only evidence for identifying such a thrust fault. In fact, professional geologists had several robust ways to determine whether rock strata were lying upside down or not.

Price chose to believe, rather, that in fact the rocks were really laid down in the reverse order. This helped him to argue that all rocks were laid down in one catastrophic event without evidence for an identifiable progressive succession of life. Over time, Price would become more convinced of the veracity of evidence for the reverse order of fossils and make the Rocky Mountain thrust faults in Alberta and Montana his key data to argue against the existence of a chronological order of fossils. In *The Fundamentals of Geology* (1913) he would devote almost thirty pages with photographs and diagrams to emphasise his point against the existence of overthrusts. Most geologists interpret overthrust or thrust faults as having developed dynamically over long periods of time as more recently explained by plate tectonics.

Price created **Fact Number Four** as follows: *The rivers of the world, in cutting across the country, completely ignore the varying ages of the rocks in the different parts of their courses, and act precisely as if they began sawing at them all at the same time*.[151]

This oversimplification and slightly awkward statement goes against the findings of such iconic American geologists as Powell, Dutton, Davis, and Gilbert, who agreed on the principle of the *gradual* backward progress of erosion during the excavation of a valley.[152] Price's fourth fact is a naive oversimplification, as river systems generally provide evidence of substantial changes during their life span. There is ample geological and geomorphological

150. Price, *Illogical Geology*, 30.

151. Price, *Illogical Geology*, 32. Italics added for emphasis.

152. von Zittel, *History of Geology*, 209-10.

evidence of proto- and palaeo-river systems that have shifted positions, experienced river piracy or even flow-reversals in relation to tectonic forces over time. River system analyses commonly provide evidence of phased developments against the interplay of climatic changes and tectonic activity. Price even uses Powell's explanation (as given by von Zittel in *History of Geology*) on the complex erosion of the Colorado River:

> after the river had eroded its channel rocks were uplifted in one portion of its course, but so slow was the rate of uplift that the river was enabled to deepen its channel, either proportionally or more rapidly, so that it was never diverted from its former course.[153]

Price sees such attempts at explanations as "cunning inventions", but eventually "the force of accumulated facts" would expose their "absurd theories", as also happened with earlier writers on astronomy, alchemy, and medicines.[154] Price was convinced that river systems of the world began cutting down at the same time as if all the rocks were of the same age. With Fact Number Four Price underscored the point that, according to him, there were no real differences in the ages of rocks but that they were all deposited at the same event.

In conclusion, the four geological principles constructed by Price provided him with substantial proof that "there is no particular order in which the fossils can be said to occur as regards succession in time."[155] Any alternative explanation constitutes for him an "illogical and wholly unscientific procedure."[156] Price was convinced that geological arguments which suggested a progressive succession of life are purely the result of "illogical reasoning." The fossils identified in geological series can, according to him, only be seen as "the taxonomic or classification series of an older state of our present world."[157]

Biological Facts from the Rocks to Support the Need for a 'True Induction'

Following the geological arguments, Price looked at a number of biological arguments that could throw further doubt on the evolution theory. Firstly, he considered the subject of extinct species as evidence in favour of the life succession theory. He is convinced that "the mere fact of certain species being extinct and others being now alive, was not a

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153. Price, *Illogical Geology*, 31; von Zittel, *History of Geology*, 210-1. Von Zittel does not provide a reference for Powell's explanation. Explanation comes possibly from U.S. Department of the Interior, Report on the Geology of the Eastern Portion of the Uinta Mountains and a Region of Country Adjacent Thereto, by J. W. Powell. U.S. Geological and Geographical Survey of the Territories. Washington, 1876.

154. Price, *Illogical Geology*, 31.

155. Price, *Illogical Geology*, 32.

156. Ibid.

157. Ibid., 33.

trustworthy guide in determining the relative age of their remains."[158] Price, for example, quotes David Page who recognised the importance of the embedded fossils in determining the Tertiary character of certain deposits. Price points out that this approach was all based on the uniformitarian assumption, which in essence took for granted beforehand the main point of geological inquiry; first assuming one's premises, and then proving them by means of one's conclusion. Instead of assuming uniformity, Price thinks that 'true induction' can more positively decide whether the "tools of nature" have always worked in a uniform fashion or not.[159] Because of the inherent weakness of the argument, Price concludes, "The life succession theory has not a single fact to confirm it in the realm of nature. It is not the result of scientific research, but purely the product of the imagination."[160]

Secondly, he looked at the 'absurdity' of fossils skipping huge periods of geological time. He outlined the "absurdity" of the "modern inhabitants of the modern seas and the modern land skipping all the uncounted millions of years from 'Palaeozoic times' down to the 'recent'". . . without some trace of them in the intermediate deposits.[161] Younger deposits should, according to Price, contain samples of older life forms. Geologists, such as James Geikie generally explained the sudden disappearance of the old life forms and the first appearance of the new life forms as an inherent imperfection of the geological record. Applying his *modus operandi*, Price untiringly searched the texts of leading geologists to find flaws in their methodology under exceptional situations. From a "well-known authority already quoted" [162], he mines the following quote: "Some geologists make it a point to give a new name to all forms found in the Palaeozoic rocks, i. e. a name different from those of modern species." Price suggests that such a practice in terminology supported the 'absurdity' of 'skipping' and helped to perpetuate the life-succession theory.

Thirdly, he discusses the occurrence of so-called fossil graveyards, where fossil animals in a recognisable state of preservation were heaped together in astonishingly large numbers. Such graveyards must, according to Price, have formed in a catastrophic fashion. He quotes examples from Buckland, Dana, De la Beche, Joseph Prestwich, and others of

158. Ibid., 36.

159. Ibid., 36.

160. Ibid., 41.

161. Ibid., 42.

162. Ibid., 45. Price does not clarify which 'well-known authority' this is.

occurrences of such "abnormal" deposits.[163] Where geologists seemed willing to accept various incidences of catastrophes at the ends of major geological intervals, Price sees instead abundant *prima facie* evidence of only one major cosmic convulsion that occurred on earth.[164] He admits that the exact cause, nature, and extent of *the* event will be difficult to determine, but he promises further supporting facts further on in *Illogical Geology*.

His fourth argument noted the absence of evidence for recurring events including major climate change. Price is of the opinion that, except for the so-called "Glacial Age," all the fossils provide proof of just a "singular uniformity of climate" on earth with an "almost eternal spring in the Arctic regions, and semitropical conditions in north temperate latitudes."[165] He thinks that there was not sufficient geological evidence for a regular variation of climates due to cycles in the eccentricity and precession of the earth's orbit as, for example, had been suggested by the nineteenth century scientist James Croll. Price had found support for his ideas in quotes from Howorth's *The Glacial Nightmare and the Flood* and other carefully selected quotes from James Dana's *Manual of Geology*.[166] According to Price the evidence is conclusive that, "all geological time down to [a] sharp 'dividing line' is characterised by a surprisingly mild and uniform climate all over the earth."[167] After that 'dividing line,' however, "the modern period was characterised by terrific extremes of heat and cold; and now little or nothing can exist where previously plant and animal life flourished in profusion."[168] This observation clearly echoed Ellen White's description of the climates and vegetation before and after the Flood in *Spiritual Gifts*.[169]

The next fact raised by Price in support of the occurrence of the cosmic convulsion was the convincing evidence of biological degeneration since the creation of the earth. According to him, "degeneration has marked the history of every living form."[170] Price believes that fossil life forms were generally "larger of their kind and better developed in every way than their nearest modern representative plants and animals."[171] He quotes

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163. Ibid., 55-62

164. Ibid., 63.

165. Ibid., 64.

166. Ibid., 64-7.

167. Ibid., 69.

168. Ibid.

169. White, *Spiritual Gifts*, 68, 76, 79.

170. Price, *Illogical Geology*, 73.

171. Ibid., 70.

carefully selected examples from Dana, James Geikie, and others to support his belief. Although there were indications for some cases, the quoted authors did not state that this was so in all cases. Nonetheless, it led Price to make the bold statement regarding the size and physical development of life forms: "we find in geology no indication of inherent progress upward."[172] In contrast to the evolution theory, he rather found evidence for a "great biological law, that degeneration has marked the history of every living form."[173]

Finally, Price discusses evidence of fossil men in the geological record as a fact that supported the occurrence of a major catastrophe. He believes that besides living animals and plants, man himself must have witnessed something of the nature of a cosmic convulsion.[174] Price quotes Dawson, Prestwich, Dana, and others in support of his belief. He concludes, without much substantial evidence, that people had seen the completion of all great mountain ranges; the distribution of land and water surfaces had completely changed since people's advent; and that men lived in the Arctic while the Arctic region had a mild soft climate until there was a catastrophic change.[175]

A Plea for Inductive Geology

Price had become convinced that there was no evidence for long geological time as required for the evolution theory. He states that only *if* inductive methods were forsaken and one assumed some form of evolution *a priori*, was there evidence for (geologically speaking) long time.[176] Price exhaustively perused literature to find evidence from such authors as Quatrefages, Dupont, Boyd Dawkins, Howorth, Prestwich, Wright, and William Dawson, "that most geologists now admit the certainty of some sort of catastrophe since man was upon the earth."[177] However, not all cited authors were equally recognised full-time practicing geologists that were *au courant* with the theory and development of geology's stratigraphy. The Belgian Armand de Quatrefages (1810-1892) and the Frenchman Edouard François Dupont (1841-1911) were, for example, more qualified in the fields of biology, palaeontology or history. William Boyd Dawkins (1837-1929) was as much an archaeologist as a geologist. Henry Howorth (1842-1923) was an amateur historian, an amateur geologist,

172. Ibid., 73.

173. Ibid.

174. Ibid., 74.

175. Ibid., 80.

176. Ibid., 83.

177. Ibid.

and a politician. Joseph Prestwich (1812-1896) was known as a geologist, archaeologist, and businessman. Nonetheless, Price was convinced that he had sufficiently exposed the myth of a geological succession and believed that, instead, the fossils pointed to a single catastrophic cosmic convulsion.

Price reasons that if the harmonising geologist Dana is allowed to suppose catastrophic events to have occurred at the end of the Palaeozoic age and the end of the Mesozoic, it is not such a big step to start believing in the possibility of a *single* world-wide catastrophe which could explain *all* geological changes. He therefore boldly claims at the end of his book to have "established a perfect chain of scientific argument proving a world-wide catastrophe of some sort since Man was upon it."[178] While the 'illogical geology' of geologists tried to explain the formation of a world, Price believes that *inductive* geology deals with "the ruins of one; as it can teach us absolutely nothing about origins."[179] By stating that "inductive geology can never prove creation," it will, according to Price, eradicate the false idea of a succession of life and point to the only possible alternative; creation as a definite act of God.[180]

In *Illogical Geology,* Price had moved towards a greater focus on perceived flaws in stratigraphical methodology in geology. It was not entirely novel since it contained some similarity with aspects that Alonzo Jones had written two decades earlier. Firstly, upside-down stratigraphy which had been briefly outlined by Jones had become a more prominent topic in Price's 1906 text (see table 6.2). In later books, Price would develop this further into a leading example of what he saw as a seriously flawed foundation of stratigraphical methodology in geology. Secondly, the basic structure of Jones' two article series of anti-evolutionist thinking, as earlier published in *The Signs of the Times* [ST-UGS and ST-EE], was also identifiable in *Illogical Geology*. Jones had dealt with geological arguments in the first section and with biological arguments in the second section. The ultimate goal of Jones' two series had been to show the flaws of the evolution theory. Price had held the same goal. Thirdly, reminiscent of Jones' approach was Price's contextomy.[181] Both used this technique

178. Ibid., 85

179. Ibid.

180. Ibid., 90.

181. "Contextomy refers to the selective excerpting of words from their original linguistic context in a way that distorts the source's intended meaning . . . A contextomized quotation prompts audiences to form a false impression of the source's intentions." McGlone, "Contextomy: the art of quoting out of context," 511.

to find seemingly anti-evolutionary sentences in the writings of authoritative scholars that predominantly supported evolutionary thinking.

6.5.2 The Fundamentals of Geology (1913)

Fundamentals of Geology was published in 1913 as an updated and expanded form of his 1906 paperback, *Illogical Geology*.[182] Price had distributed 500 self-funded copies of *Illogical Geology* among geologists, other scientists and clergymen in the USA and England for examination and criticism of his arguments for a new inductive geology. The many reactions he received led to improvements and enlargement through the addition of his new geological discoveries.[183] After confessing in *Outlines of Modern Christianity and Modern Science* that he was *not* a geologist, Price identifies himself on the title page of his next book, *Fundamentals of Geology*, as a "Professor of Geology." Without any practical field experience or formal academic training but purely through self-education and determination he had managed to raise his profile, in Adventist circles at least, to a professorship in geology.

Just as in *Illogical Geology*, Price kept Howorth's quote from *The Glacial Nightmare and the Flood* on the title page of *Fundamentals of Geology*. This shows how much Price identified himself with Howorth's arguments against modern geology and also proved to his readers that there were other authorities that had similar opinions. A cursory glance at the subtitles of their books and their contents shows indeed many parallels in the arguments contained in Price's and Howorth's writings on the role of the Genesis Flood in shaping the rocks and landforms of the earth. Both distrusted *a priori* reasoning in geology and instead favoured a purer inductive approach. Both also did *not* believe in an Ice Age, which they saw as an invention of the geologists to deny the impact of a catastrophic Flood. A novel feature was Price's dedication of *Fundamentals of Geology* to Francis Bacon and Isaac Newton and their contribution to establishing an inductive methodology for natural science. This tied in well with, and emphasised, Price's arguments for the use of more inductive reasoning in geology that, according to him, was more supportive of the creation of the earth as an act of God.

Following the title page of the book, there is in the front matter a page of testimonials regarding *Illogical Geology* as the first edition of *Fundamentals of Geology* (see fig. 6.3).

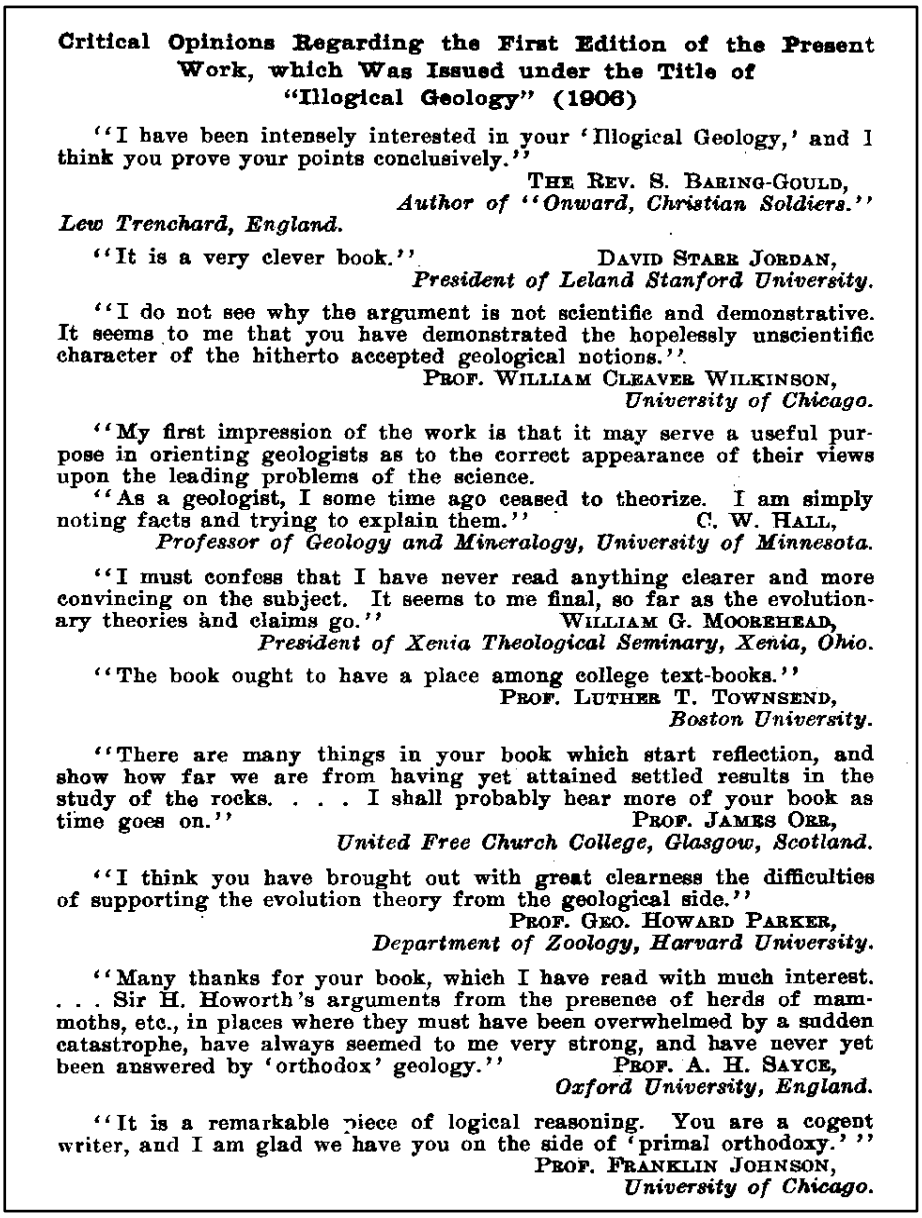
182. Numbers, *The Creationists*, 95.

183. Price, *Fundamentals of Geology*, 7.

Table 6.2. Comparison of major themes present in the 1885 articles of Alonzo Jones and the early geology books of George McCready Price

Major themes in Alonzo Jones' geology and evolution articles in *The Signs of the Times* (1885)	**Major themes in George McCready Price's *Illogical Geology* (1906) and Fundamentals of Geology (1913)**
Assumptions and speculations	
Assumption upon **assumption**, and inference upon inference, are proposed upon confessedly uncertain data, and from that, then ***speculation*** to an unlimited degree, is indulged in, and all this is offered to us in the name of science! (v.11, no.22, 340)	It [the new system of identifying rocks by their fossils] involved all the arbitrary **assumptions**, all the incredible fictions about unnatural past conditions, which characterised the theory of Werner which it professed to displace. (Fundamentals of Geology, 45) Of course we know that nothing born of this whole brood of **speculations** can ever secure a permanent home in the kingdom of science. (Fundamentals of Geology, 50)
Geology is not a demonstrative science	
The one essential element that is lacking in all these productions on geology is ***demonstration***. *Geology is not susceptible of* ***demonstration***. Astronomy is. When, from the fall of an apple, **Newton** reached the law that governs every particle of matter in the universe, *that was* ***science***. (v.11, no.22, 340)	All efforts thus to lay out a history of organic creation as Cuvier's "glorious" vision pictured it to him, have ended in a miserable failure, because such efforts are along lines so false that they are rapidly making geology a laughing-stock to the other **sciences** founded on the principles of **Bacon** and **Newton.** (Fundamentals of Geology, 246)
Use of circular reasoning	
One of these [quotations from Geikie] says that the *age of the rocks* is determined *by the fossils*. The other says that *the relative age of the fossils* is determined *by the rocks*. What is this but **reasoning in a circle**? (v.11, no.20, 308)	Whatever may be the real reason to be learned from the embryonic development, it is most fantastic and **circular reasoning** to bring it in as argument for evolution, considering the way in which it has been used to build up the geological series. (footnote, Fundamentals of Geology, 123)
Perceived problems with stratigraphy	
If huge **mountain masses** are lying in a directly **inverted** position to that of the valleys or the plains, how can we tell which is "**upside down**"? And how is the true order of superposition [of **strata**] to be settled? (v.11, no.20, 308) And what then becomes of the law of superposition [of the strata]? . . . the superposition of the **strata** may be **deceptive**. (Ibid.)	We have this astounding picture of an immense **mountain mass** having been put "**upside down** over an area of 450 square miles." The "older fossils are evidently here on top, while the "younger" ones are underneath. (Illogical Geology, 27) We may encounter in the literature of the science that it is the **reversed order** of the fossils which constitute the whole evidence [for inverted strata]. A calm judicial mind, divested of all theoretical prejudice, instead of talking about these conditions having been planned by nature "for the purpose of **deception**," will find no difficulty at all in believing that these **rocks** were really laid down in the **reverse order** in which we now find them, with the "younger" below and the older above (Illogical Geology, 30.) Any kind of **rocks** whatever, i.e. containing any kind of fossils, even the "youngest," may rest on the Archaean, and may thus in position, as also in texture and appearance, resemble the very oldest **deposits** of the globe. (Illogical Geology, 32) Any kind of beds may rest in such perfect conformability on any other so-called "older" **beds** over vast stretches of country that, "were it not for fossil evidence, one would naturally suppose that a single formation was being dealt with." (Illogical Geology, 32)

These positive comments were obviously placed there to encourage people to buy the second edition of a book that carried so many endorsements. It should be realised that it did not include endorsements from many renowned geologists. Additionally, not all positive quotes reflect the general intentions of the responders. For example, David Starr Jordan (1851-1931), President of Leland Stanford University and renowned ichthyologist, was quoted as having judged it "a very clever book" (see fig 6.3). Numbers, however, provides additional information on Jordan's opinion of Price's geological writing. Jordan actually corresponded for an extended time with Price and told him *inter alia* that "his case against geology was 'based on scattering mistakes, omissions, and exceptions against general truths that anybody



Critical Opinions Regarding the First Edition of the Present Work, which Was Issued under the Title of "Illogical Geology" (1906)

"I have been intensely interested in your 'Illogical Geology,' and I think you prove your points conclusively."

THE REV. S. BARING-GOULD,
Author of "Onward, Christian Soldiers."
Lew Trenchard, England.

"It is a very clever book." DAVID STARR JORDAN,
President of Leland Stanford University.

"I do not see why the argument is not scientific and demonstrative. It seems to me that you have demonstrated the hopelessly unscientific character of the hitherto accepted geological notions."

PROF. WILLIAM CLEAVER WILKINSON,
University of Chicago.

"My first impression of the work is that it may serve a useful purpose in orienting geologists as to the correct appearance of their views upon the leading problems of the science.

"As a geologist, I some time ago ceased to theorize. I am simply noting facts and trying to explain them." C. W. HALL,
Professor of Geology and Mineralogy, University of Minnesota.

"I must confess that I have never read anything clearer and more convincing on the subject. It seems to me final, so far as the evolutionary theories and claims go." WILLIAM G. MOOREHEAD,
President of Xenia Theological Seminary, Xenia, Ohio.

"The book ought to have a place among college text-books."

PROF. LUTHER T. TOWNSEND,
Boston University.

"There are many things in your book which start reflection, and show how far we are from having yet attained settled results in the study of the rocks. . . . I shall probably hear more of your book as time goes on." PROF. JAMES ORR,
United Free Church College, Glasgow, Scotland.

"I think you have brought out with great clearness the difficulties of supporting the evolution theory from the geological side."

PROF. GEO. HOWARD PARKER,
Department of Zoology, Harvard University.

"Many thanks for your book, which I have read with much interest. . . . Sir H. Howorth's arguments from the presence of herds of mammoths, etc., in places where they must have been overwhelmed by a sudden catastrophe, have always seemed to me very strong, and have never yet been answered by 'orthodox' geology." PROF. A. H. SAYCE,
Oxford University, England.

"It is a remarkable piece of logical reasoning. You are a cogent writer, and I am glad we have you on the side of 'primal orthodoxy.'"

PROF. FRANKLIN JOHNSON,
University of Chicago.

Figure 6.3. Front matter, foreword for *Fundamentals of Geology*

familiar with the facts in a general way cannot possibly dispute'. "[184] In another of his letters, Jordan, urging Price to become an evolutionist, wrote that Price should not expect "any geologist to take [his work] seriously."[185] It appears that Jordan's endorsement in the front of *Fundamentals of Geology* was an example of quote mining.

In the Preface of *Fundamentals of Geology*, Price points to the great increase of his own knowledge of the so-called thrust fault in Alberta that is now known to extend over a much larger area than first thought. Price became aware that the Lewis overthrust actually extended beyond Alberta, Canada, into Montana, USA, to cover an area of several thousand square miles. Because of the enormous extensions of this 'invention' claimed by the geologists, Price thought this highly impossible. This new information convinced Price that he should once and for all repudiate these claims of the 'evolutionary' geologists.[186] His increased knowledge on the Lewis overthrust led him to a complete rewrite of the chapter on upside-down mountains to which he added photographs, a geological map, geological cross-sections, and a sketch. The addition of such illustrations to the text was perhaps a first development towards producing a textbook, an idea that he may have had in mind for some time.

Overthrusts and a New Stratigraphic 'Law'

It was ultimately the sheer size of the Alberta-Montana overthrust that convinced Price of the validity of his case against the geologist's dogma of a succession-of-life. He suggests that the only evidence for interpreting such a large area – "a whole country" – found upside down is that "the strata are here in the wrong order."[187] He relates the wrong order of the strata to geologists finding "older" (Cambrian) fossils on top and "younger" (Cretaceous) ones underneath. Price selected quotes from a Canadian geological report that highlighted complicating factors such as a very low angle of inclination of the fault plane, apparent conformable contact between the strata on either side of the fault plane, and the fact that the underlying soft Cretaceous shale showed little evidence of deformation. Price found this

184. Numbers, *The Creationists*, 106-7.

185. D. S. Jordan to G. M. Price, August 28, 1906 (Price Papers, Andrews University, Berrien Springs, MI.)

186. Numbers, *The Creationists*, 96-7.

187. Price, *Fundamentals of Geology*, 81-2.

totally illogical and saw the root cause of this in the simple mistakes that pioneer geologists had made. With italic emphasis he states:

> *Solely on the strength of the infallibility of a theory invented a hundred years ago in a little corner of Western Europe, which 'promulgated, as representing the world, a scheme collected from that province," and assumed that over all the world the rocks must always follow the order there observed, we are here asked to deny the positive evidence of our senses* BECAUSE *these rocks do not follow this accepted order*.[188]

Not many geologists would agree with Price's naive and simplistic comments regarding this state of affairs. Price simply couldn't believe why the geologists had persisted in identifying such overthrusts and asks, "*How much of the earth's crust would we have to find in this upside-down condition in order to discredit this life succession theory?*"[189] Very few, if any, professional geologists would actually read this book, and it would not be until his more widely circulated textbook, *The New Geology*, was published that some geologists severely criticised his statements.

Totally convinced that there were major flaws in the stratigraphical principles as applied by professional geologists, Price boldly proposed a new and "most important" law in stratigraphical geology. He labelled it the *Law of Conformable Stratigraphical Sequence* and defined the new law as follows: "ANY KIND OF FOSSILIFEROUS ROCK MAY OCCUR CONFORMABLY ON ANY OTHER KIND OF FOSSILIFEROUS ROCK, OLD OR YOUNG."[190] According to this suggested law any fossiliferous rock layer, older or younger, could be found conformably (without any signs of interruption in the sedimentation process) on another fossiliferous rock layer. In other words, chronostratigraphic differentiation, or differences based on perceived age, was no longer of importance. It is easy to see that the formulation of this unrealistic law was instigated by reported overthrust faults that display paraconformities (**un**conformities that have the appearance of being conformable). Although Price had no field skills, paraconformities were no real problem for skilled field geologists because they had the expertise to solve such complex situations.

For Price, this 'law' would show that overthrusts were *not* rocks found in reverse order caused by large-scale structural processes, but rocks found in a normal undisturbed sequence. Price wanted to show that all fossiliferous rocks were formed during the same catastrophic event without any chronostratigraphic ordering of fossils. It appears that Price

188. Ibid., 87.

189. Ibid., 103; Italics by Price.

190. Ibid., 119; Capitals by Price.

was playing here the 'devil's advocate' to provoke a reaction from the geological establishment. However, the new law would go totally unnoticed until the publication of his 1923 textbook.

6.5.3 The New Geology (1923)

Price wrote *The New Geology* after Pacific Union College in California had granted him a year off in 1921 (with his salary 'paid' by the General Conference) to work on an earlier manuscript.[191] At first glance, *The New Geology* had the structure and appearance of a normal geological textbook. Yale University Professor Charles Schuchert (1858-1942), a leading palaeontologist and stratigrapher, calls it, in a highly critical book review, a "good-looking book, with excellent illustrations [which] gives a first impression of actually being an orthodox and high-grade text-book of geology."[192] However, Schuchert continues, a careful perusal of the work shows that it is actually a "travesty [of] the real science of geology."[193] On first impression, it was indeed an impressive geological work of 726 pages subdivided into sections on Physiographic Geology, Structural Geology, Dynamical Geology, Stratigraphical Geology and Theoretical Geology. Only after a closer examination would one notice that throughout the book the geological material was interspersed with brief references towards Price's ultimate objective in guiding the reader to an acceptance of the reality of a 'new catastrophism'; the importance of the Flood in the formation of the rock strata and the present landscape. His familiar arguments as presented in his earlier works did not appear this time until the final chapters. For the lay public this approach provided the appearance of substantial geological support for his arguments for a biblical Flood Geology.

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191. Clark, *Crusader for Creation*, 45. The proceeds of *The New Geology* went to the Adventist Church as a reimbursement to repay his salary for the period used to write the book. Numbers, *The Creationist*, 105.

192. Charles Schuchert, "Scientific Books. *The New Geology: A Textbook for Colleges, Normal Schools and Training Schools; and for the General Reader.* By George McCready Price. Pacific Press Publishing Association, Mountain View, California." *Science* LIX, no. 1535 (May 30, 1924): 486. A photograph of Chief Mountain, Montana as an example of rock formations with the wrong order of fossils featured prominently in the front matter of *The New Geology.* For the careful observer the picture of Chief Mountain with much older rocks seemingly conformable on top of Cretaceous shales, on opening the book, positioned as a frontispiece or *picturae loquente*, next to the title page, was a strong indicator of Price's intentions. For the significance of such photographs, see Karl Josef Höltgen,"Early Modern English Emblematic Title-Pages and their Cultural Context," in *Entrée aus Schrift und Bild: Titelblatt und Frontispiz im England der Neuzeit* ed. Werner Bush, Hubertus Fischer, and Jachim Möller, (Berlin: LIT Verlag, 2008), 40 [40-79].

193. Schuchert, "Book review, *The New Geology*," 487.

With the wider circulation also came reactions from professional geologists. Numbers has provided a substantial review of the various professional reactions to the book.[194] Orthodox geologists that bothered to respond were highly critical. However, some people felt that Price might be right, and "clergymen of many denominations found *The New Geology* a great help in strengthening their faith in the literal record of Genesis."[195] Geologists saw it as being destructive to the integrity of their science; creationists praised it because Price articulated, in a commonsensical fashion, perceived flaws in geology that supported their cause, the invalidation of the theory of evolution. These opposing perspectives, unfortunately, then and now, continue to fuel an ongoing feud of opinions.

Among the geologists who reacted were Charles Schuchert, Arthur Miller, and Stephen Richarz. Schuchert's uncompromising professional opinion is that Price's book makes a total mockery of genuine geology which "has been built up through the labors (sic) of the geologists of the world during more than a century of observation, study and criticism."[196] Arthur Miller, Professor of Geology and Zoology at the University of Kentucky had, just prior to the publication of *The New Geology*, acrimoniously accused Price of "holding preposterous opinions," while being "a member of no scientific body and absolutely unknown in scientific circles, [who] has . . . had the effrontery to style himself a 'geologist'. "[197] Miller was especially annoyed with Price because of,

> impugning the competency or integrity, or both, of the distinguished geologists who vouch for [the] existence [of the great thrust faults of the earth]: as that of Heim and Rothpletz for the great Glarus overthrust in the Alps, that of Geikie for the great overthrust in Scotland, that of McConnell, Campbell and Willis for the great overthrust along the eastern front of the Rockies in Canada and northwestern United States, and finally that of Hayes for the numerous overthrusts in the southern Appalachians.[198]

Because many saw Price's arguments as being too outrageous even to imagine, few geologists indeed bothered to address the geological issues they saw as wrong in Price's *New*

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194. Numbers, *The Creationist*, 109-114.

195. Clark, *Crusader for Creation*, 49, 51.

196. Schuchert, "Book review, *The New Geology*," 487.

197. Arthur M. Miller, "The New Catastrophism and its Defender," *Science*, LV, no. 1435 (June 30, 1922): 702-3. These reactions were more specifically addressed to similar issues as published earlier in *Fundamentals of Geology* and *Q. E. D., or New Lights on the Doctrine of Creation*. Q.E.D. is an abbreviation for the Latin phrase *quod erat demonstrandum* meaning "which was to be demonstrated." Price was also a Latin teacher and on occasion made use of Latin terms.

198. Miller, "The New Catastrophism and its Defender," 702.

Geology. For example, geologist-geographer Malcolm H. Bissell (1889-1975) wrote to Price that his arguments were "really not worth answering."[199] Those who did respond dealt strictly with geological issues and did not discuss Price's New Catastrophism as his hypothetical solution.

Special mention must be made here of Reverend Father Stephen Richarz who made a distinctive effort to counter Price's arguments on the basis of professional geological considerations. The occasion of his lengthy response was a review of fellow Catholic Professor Barry O'Toole's agnostic book, *The Case against Evolution*.[200] O'Toole was Professor of Theology, Philosophy and Animal Biology at Seton Hill College in Greensburg, Pennsylvania and had no geological expertise. Richarz, on the other hand, was Professor of Geology at St. Mary's Mission House in Techny, Illinois, had a PhD in geology, had taught geology for several decades, and had contributed original research to accredited geological journals. O'Toole's work aimed to counter materialistic evolutionary dogmatic thought which he, like others at that time, perceived as a threat to twentieth century intellectual credibility.[201] Because O'Toole had no geological background, he blindly echoed Price's perceived flaws in professional geological stratigraphy in writing against evolution theory. O'Toole presented Price's views at length in almost verbatim form as articulated in *The New Geology*. He was especially impressed by Price's revelations on 'deceptive conformities' and 'overthrusts.'[202] Although well aware of Price's 'pariah' status in professional geological circles, he thought it nonetheless valuable for his cause to consider the "objective validity of [Price's] argument against the chronometric value of the index fossils."[203]

Richarz's review was especially meaningful in this context because he was a contemporary of Price, had a solid geological foundation and had the willingness and patience to explain Price's geological fallacies for a non-geologist audience. For these reasons, Richarz's review will be used here at some length to provide a geologist's contemporary reaction to Price's text. While reviewing O'Toole's book, Richarz had come

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199. See Numbers, *The Creationists*, 111 & endnote 48, page 468.

200. George Barry O'Toole, *The Case Against Evolution* (New York: The MacMillan Company, 1926).

201. See Adam Laats, *Fundamentalism and Education in the Scopes Era: God, Darwin, and the Roots of American Culture Wars* (New York: Palgrave MacMillan, 2010), 67.

202. O'Toole, *The Case Against Evolution*, 97-127.

203. Ibid., 98.

across the cited parts from Price's *The New Geology*. Many of Price's blanket statements piqued Richarz. He, for example, is annoyed by Price's "staggering assertion" that,

> There is no possible way to prove that the Cretaceous dinosaurs were not contemporary with the late Tertiary mammals; no evidence whatever that the trilobites [Palaeozoic] were not living in one part of the ocean at the very same time that the ammonites [Mesozoic] and the nummulites [Cenozoic] were living in other parts of the ocean; and no proof whatever that all these marine forms were not contemporary alike with the dinosaurs and mammals.[204]

Like Miller before him, Richarz could not imagine that Price denied the work of "hundreds of serious and able scientists who devoted their whole life to the construction of the present palaeontological system of recording the sequence of fossils in geologic history."[205] Richarz tried to calmly expose the fallacies of Price's argument with examples of overthrusts where proof for their existence "can be obtained [on the basis of their lithology alone] without regard to the fossils contained in the strata."[206] Richarz, claims that in such a situation, "no one can call such observed facts a reconstruction made by evolutionists in favour of their theory."[207] In his refutation, he provided additional evidence from other locations in the Alps. Such reversals of the order (with fossils in the "wrong order"), Richarz patiently explains, were due to dynamic processes and not to original deposition. A simple study of the stratigraphy of the surroundings was all that was generally needed to understand this.

Convinced of his case, Price, according to O'Toole, had stated that, because of the widespread occurrence of overthrusts, exemplifying "wrong orders" of successions of life across the globe, "the old notion about the exact and invariable order of the fossils has to be given up entirely."[208] O'Toole blindly agrees and comments, "we are no longer justified in regarding any fossils as intrinsically older than other fossils, and that our present classification of fossiliferous strata has a taxonomic, rather than a historical value."[209] To

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204. Price, *The New Geology*, 677.

205. Stephen Richarz, "Evolution in the Light of Geology," *Fortnightly Review* 6 (December 1, 1925): 486.

206. Richarz, "Evolution in the Light of Geology," 487.

207. Ibid.; He outlines as an example the rock strata structure along Lake Lucerne in Switzerland. While walking along the rock strata one can identify the overthrust. An increasing angle of the strata results in an overturned position. The evidence is based on lithology and not fossils.

208. O'Toole, *The Case Against Evolution*, 107-8. It appears that O'Toole cited Price rather liberally here. The quote does not occur exactly in *The New Geology*, but O'Toole apparently paraphrased what Price had written on pages 629-30.

209. O'Toole, *The Case Against Evolution*, 108.

refute such outright statements, Richarz intentionally analysed Price's *supreme* example of fossils in the "wrong order," the Alberta-Montana overthrust. He explains how in the Bow River Gap in Alberta, Canada, the soft Cretaceous (geologically younger) shale along the fault plane adapted itself to the harder Precambrian (geologically older) limestone and caused the *impression* of "wrong order" conformity. What is more, Richarz states, "Overthrusts have [even] been found quite independently from fossils; they can even be seen in Precambrian formations, in which there are no fossils at all."[210] Therefore, "the formidable argument of Mr. Price against the sequence of fossils ['succession of life'], as unanimously accepted by all geologists, breaks down completely."[211] Richarz confidently concludes:

> There is not a single instance of fossils in the 'wrong order' which cannot be accounted for by overthrusts or overturned folds, and careful study in the field shows conclusively that such disturbances are, as a matter of fact, always the cause of the 'wrong order.' It is [therefore] false to say that geologists postulate the great overthrusts in order to 'explain away wrong sequences of fossils.' . . . Mr Price can deceive only those who are strangers in the science of geology.[212]

To refute the general objections of Price against the time-value of the geologic system based on fossilised organisms, Richarz patiently went on to explain how such a system was established from early beginnings in Germany and were extended over time through research work in France and England and eventually to such faraway places as India, the East Indies, and South America. Geologists used this system to infer cautiously that strata containing similar fossils, although widely scattered over the globe, were contemporary. As Price had discussed, Herbert Spencer and Thomas H. Huxley struggled to accept this geological principle. They did not appreciate the spatial aspect inherent in geological thinking. Field-experienced geologists recorded and reported their findings, on a pragmatic basis, independently of complex theoretical, philosophical issues. Those not familiar with field work and mapping practices wondered how it was possible that similar fossils could be found in far remote locations? Instead of debating philosophical issues for dealing with fossils in separated locations, geologists with their spatial perspective came to the pragmatic conclusion that similar fossilised marine animals, such as for example ammonites, which were found in the Alps, the Himalayas and in the Sierras of the western USA must have lived in a vast ocean which one time extended from India over Europe to Western America.

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210. Richarz, "Evolution in the Light of Geology," 488.

211. Ibid.

212. Ibid.

From an academic viewpoint Richarz wonders about the academic validity of selected quotes in relation to their intended context. He wonders, for example, how O'Toole could support Price's idiosyncratic views that were shown to be misinterpretations of geological and palaeontological facts agreed upon by all geologists the world over. Richarz is convinced that even the authors cited do not endorse the views of Price. Pointing to the practice of contextomy, he writes: "one single quotation seems to be favourable, but only because the decisive parts of the report of the geologist in question are left out."[213]

Richarz also explains for readers not trained in geological issues such features as deceptive conformity, climatic change, the disappearance of the mammoth, and assertions of very tall, "physically splendid" man before the deluge. Most of all, he worries about the impact of the fact that most readers of Price's book were *not* trained in geologic questions and that they would be unable to discover his geological misinterpretations. He concludes: "They are unaware that Price's book is a travesty on the real science of geology."[214] Although Richarz had unambiguously demonstrated that Price's arguments concerning the "wrong order" of fossils in the Alberta-Montana overthrusts were unjustified, it would have no effect on the longevity of Price's conclusions. The people that read Price's work did not have exposure to Richarz's (and others) corrective comments, especially since Richarz's articles appeared in the Catholic *The Fortnightly* journal. The Adventists' stance on the Pope's perceived role in end-time events had created distrust between them and the Catholic Church.

In general, the refutations of Price's arguments did not reach (and even if they did, probably would not have convinced) the readership for which Price wrote. Clark reports that "clergymen of many denominations were helped by Price in the strengthening of their faith in the literal record of Genesis" and that Price's arguments helped them to meet "the arguments of evolutionists."[215] Nearly one hundred years later the impact of Price's tainted geological writing is still felt in orthodox Christian circles. Whitcomb and Morris with their best-seller *The Genesis Flood* (1961), largely based on Price's arguments, extended the life of Price's

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213. Stephen Richarz, "Evolution in the Light of Geology," part III, *Fortnightly Review* 7 (January 1, 1926): 10 (7-11). Richarz specifically refers to a geological report from the Geological Survey of Canada, geologic maps (no. 23, p.488). Richarz adds that the maps and the cross sections show with great evidence the **in**conformity of the formations below and above the thrust plane. Yet Price and O'Toole stick to their quote, ignore the rest of the report and "discredit the entire chronology of the organic world of the past." Ibid., 10-1.

214. Stephen Richarz, "Evolution in the Light of Geology," part II, *Fortnightly Review* 6 (December 15, 1925): 511-2.

215. Clark, *Crusader for Creation,* 49.

ideas towards and beyond the beginning of the twenty-first century.[216] Academic refutations of their work by genuine geologists continue to have minimal effect. For example, a lengthy geological explanatory refutation by Professor van de Fliert of Whitcomb and Morris' highly successful book did not shift the views of the authors and it certainly had no impact on the book's continued popularity.[217] Morris replied on behalf of both authors to van de Fliert's lengthy critique as detailed below.

Morris' response is highly relevant here because one could imagine Price to have responded quite similarly to Richarz's criticism in 1926. Morris' reply to van der Fliert showed a completely different perspective of the matter. Van de Fliert's perspective as a Protestant professor in structural geology is that "The reliability of the Word of God spoken in this world through His prophets and apostles is beyond the reach of scientific control, because the Bible is not a scientific book [which therefore] is not vulnerable to the results of science."[218] He sees at most a modest role for the results of modern geology as an indirect apologetic tool. Such a tool was not designed to prove or disprove the reliability of the Scriptures, but to test *our ideas and conceptions* about the Bible. In stark contrast to this, the *Genesis Flood* authors have as their priority to protect "the basic Christian presupposition of the inerrancy and perspicuity of the Genesis record."[219] When such a fundamental presupposition is not maintained, they feel "the remaining system may possibly be theistic, but it can be neither Biblical nor truly Christian."[220] According to their fundamentalist interpretation, the Bible teaches a strict recent special creation of all things and a worldwide Flood. Morris feels that all critics of *The Genesis Flood* ignore this fundamental belief and instead dwell on

> certain supposed flaws in our geologic perspective (e.g., our alleged failure to recognise the real nature of the geologists' concept of uniformitarianism, the supposed impropriety of documenting our case with quotations from men who do not agree with it, our alleged ignorance of the fact that there are really some examples of overthrusting, re-working of sediments and faunal mixing and other phenomena whose universal applicability we questioned, etc.), but they always pass by the much

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216. Numbers, *The Creationists*, 215.

217. J. R. van de Fliert, "Fundamentalism and the Fundamentals of Geology," *JASA* 21 (September 1969): 69-81. Professor van de Fliert, by coincidence, was one of my university instructors during my first year of study.

218. van de Fliert, "Fundamentalism and the Fundamentals of Geology," 80.

219. Cited from the response of Henry M. Morris in "Pro and Con van de Fliert," *Journal of the American Scientific Affiliation* 22 (March 1970): 35-38.

220. Ibid.

> more important and fundamental fact that the written word of God unequivocally teaches that there was a world-destroying cataclysm in the days of Noah![221]

Common ground is difficult to achieve when such perspectives are so inflexibly held.

6.6 The Alberta-Montana Overthrust Misrepresented

Price presented the Alberta-Montana Overthrust as his main point of evidence that there did not really exist a chrono-stratigraphic ordering of rocks on the basis of fossil content. The arguments against the existence of the overthrust would be briefly alluded to in *Illogical Geology*, but were most extensively discussed in *Fundamentals of Geology*. However, Price discussed thrust faults for the first time in *The Signs of the Times* periodical of March 15, 1905. This most convincing argument against the life-succession idea for him was contained in the article "XV. The Successive Ages (Concluded.)" of his "Evolution and Geology" series.[222] The 'wrong order' of fossils as exposed in thrust faults would become his flagship argument in disproving the existence of evidence for an actual succession of life. This matter is especially interesting because over time he would more boldly present this case and increasingly deviate from the facts. Price based his arguments on Richard McConnell's 1886 and Bailey Willis' 1902 geological reports on the structure of a section of the Rocky Mountains in Alberta and Montana. Price would make highly selective use of the reports to argue for the geologists' 'invention' of thrust faults to cover up occurrences of reverse order of fossils. What Price did not reveal to his readers was that both McConnell and Willis clearly explained the dynamic reasons for this isolated 'section of reverse stratigraphy.'

6.6.1 McConnell's Geological Report (Alberta, Canada) Misrepresented

McConnell's four months' fieldwork session during the field season of 1886 had resulted in "a remarkable perceptive" geological cross-section which outlined "most of the basic features of the structure and stratigraphy of the southern Canadian Rockies."[223] He had been limited in providing more detail by the steep and wooded terrain, and limitations of the length of the fieldwork period. His description of the geological structure of this part of the Rocky Mountains was the first to demonstrate the dynamic nature of the severe faulting and

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221. Henry M. Morris' letter to the Editor, in "Pro and Con van de Fliert," *Journal of the American Scientific Affiliation* 22 (March 1970): 35-38.

222. Geo. McCready Price, "XV. The Successive Ages (Concluded.)," *Signs of The Times* 31, no. 11 (March 15, 1905): 165.

223. Raymond A Price, "The Southern Canadian Rockies: Evolution of a Foreland Thrust and Fold Belt," six-day field excursion guide, Department of Geological Sciences and Geological Engineering, Queen's University, Kingston, ON, 2000, 39.

folding that had impacted the original position of the rock strata. So accurate was McConnell's perception of the basic structures, that more than a century later geologists were still filling in the details. The structural setting of the research area has become known as a "Cordilleran foreland thrust and fold belt, dominated by [numerous] thrust faults".[224] Supracrustal rocks in the foreland belt became dislocated by the movements of tectonic plates.[225]

According to McConnell's 1886 observations, the geological structure is "characterised in its eastern part by a series of great fractures and thrust faults, in the centre by broad sweeping folds, and in the west by folding and crumpling. . . . "[226] A powerful thrust from the west had, according to him, produced these great movements and dislocations, including the formation of tilted blocks and overturned folds. As a result, "Cretaceous shales have [in places] faulted under one of the older formations."[227] In the process, older [Cambrian] formations had been carried forward in a series of gigantic thrusts and in a number of places had been placed above the highest [Cretaceous] beds of the series. He suggests that the very soft Cretaceous shale may have suffered little deformation in the process. This limited deformation had created the impression of an apparent conformity of contact between the two formations. McConnell however noted the presence of a broken and faulted layer within Cambrian beds (Castle Mountain Group) directly above the Cretaceous shale as an indicator of the unconformable contact between the two.[228]

It is important to realise that McConnell's analysis of the geological structure was definitely no 'naïve blind guess work' but was based on an extensive period of empirical field

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224. Ibid.; The term Cordillera refers to a series of subparallel mountain ranges (including the Rocky Mountains); the term 'foreland' refers to the most eastern margin of the Cordillera which borders the North American Great Plains. The Cordillera formed because of the convergence between the oceanic Juan de Fuca plate and the continental North American tectonic plate. See Price, "The Southern Canadian Rockies," 1-2.

225. 'Supracrustal' refers to rocks that were deposited on the existing basement rocks of the crust.

226. R. G. McConnell, "Report on the Geological Structure of a Portion of the Rocky Mountains," in Geological and Natural History Survey of Canada (Montreal: Dawson Brothers, 1887), 40.

227. McConnell, "Report on the Geological Structure," 33.

228. See McConnell, "Report on the Geological Structure," 31; McConnell also reports that the overlying limestones [above the Cretaceous shales] are in many places strongly corrugated, whitened, and cracked in the vicinity of the fault plane due to the shearing by the thrust (p. 34).

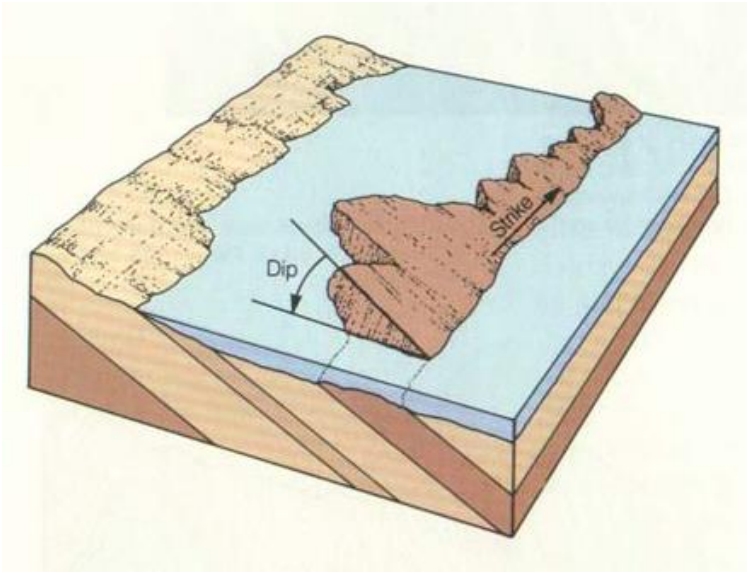


Fig. 6.4. Principle of measuring strike and dip in the field. Strike and dip are measured with a geological compass. In addition to a basic compass, a geological compass is sturdier and has a bull's eye bubble level and a clinometer built-in. The strike is the compass direction of a line marking the intersection of an inclined plane with a horizontal plane such as the Earth's surface. The dip is the maximum angle between the inclined plane and the horizontal plane. The dip is always perpendicular to strike and has both a compass direction and an angle.

Source: For picture: http:// courses.geo.ucagary.ca/glgy203/images/sd.htm. For explanation: http:// www.geologyclass.org.

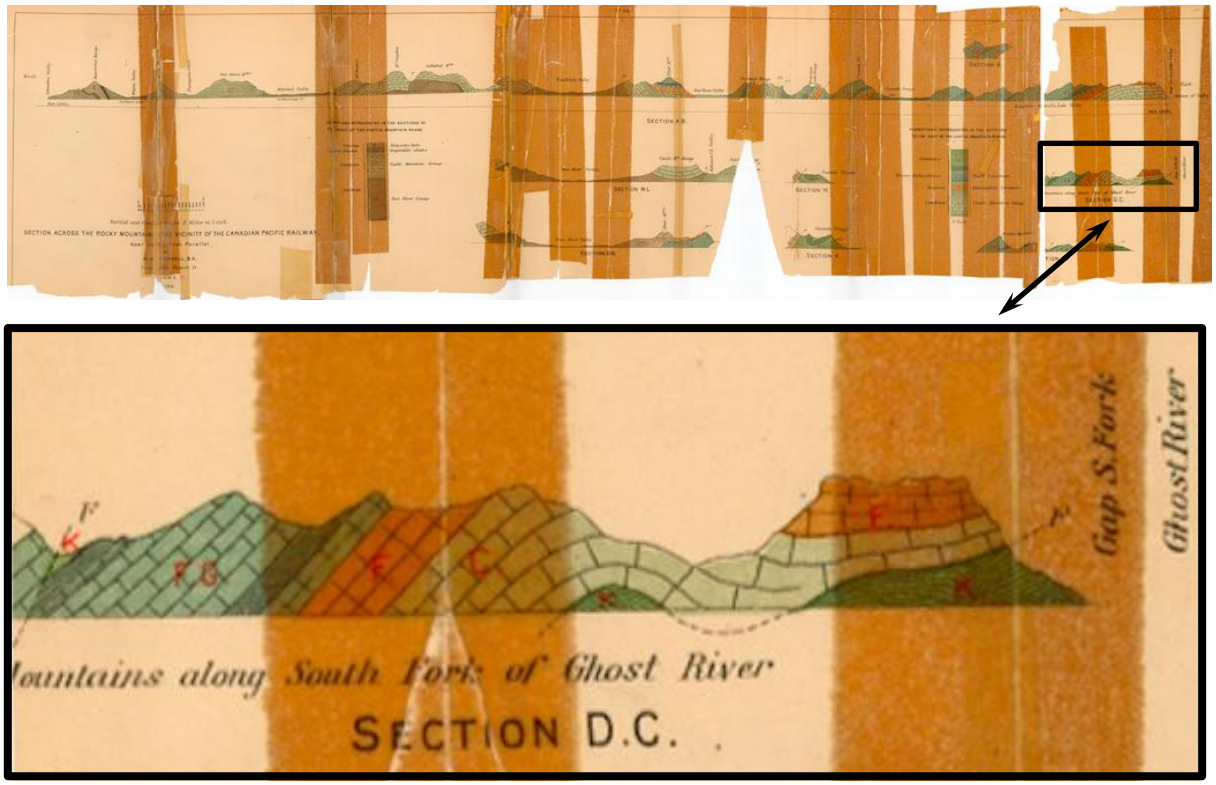
data collection.[229] Such fieldwork included, besides describing and sampling rocks for further laboratory analyses, hundreds of measurements of strike and dip of rock outcrops in the area to grasp the spatial aspect of the strata (see fig. 6.4).[230] Geological cross-sections were drawn from those observations and measurements.

Over all, McConnell's description and his accompanying cross-sections (see fig. 6.5) leave no doubt about a dynamic explanation for the reverse stratigraphic order that was created in the eastern section.[231] Following the cross-section from west to east near the 51st

229. Price would make frequent use of such derogatory terms towards geologists in his writings. See for examples of 'naïve', *Fundamentals of Geography*, 76, 100; see for 'guess(-es)', *Outlines of Modern Christianity*, 213; *Illogical Geology*, 20; *Fundamentals of Geology*, 258; *New Geology* 660, 708.

230. At some time, Price had become familiar with strike and dip because in his *New Geology* textbook he placed a drawing of the concept (on p. 86), borrowed from James D. Dana's New *Text-Book of Geology* (1883).

231. The ground-breaking work for identifying overthrust faults at a time when they were still very controversial and vigorously disputed has been applauded by Raymond A. Price, "The Southern Canadian Rockies: Evolution of a Foreland Thrust and Fold Belt," six-day field excursion guide (Queen's University, Kingston, ON, 2000), 39. A large thrust fault bears his name to honour his work. McConnell outlined most of the basic features but the overthrust is so complex that the details of it are still being filled in.



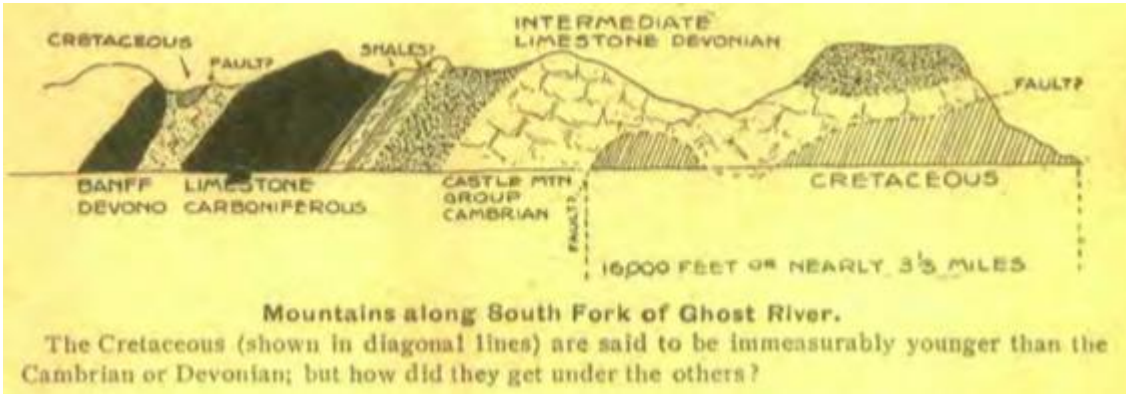




Figure 6.5. *Above*, sections (with framed insert) across the Rocky Mountains, Alberta, in the vicinity of the 51st northern latitude parallel from McConnell's geological report (1887); *middle*, illustration of the section along South Fork of Ghost River as used in 1905 by Price in "XV. The Successive Ages (Concluded.)"; *below*, drawing of the same section severely edited, used in 1913 by Price in *Fundamentals of Geology*, 89.

parallel of latitude, the original stratification order and the general nature of the faulting and folding can easily be identified. Price was aware of them because he applauded the "beautifully drawn and coloured sections" in the report and used parts of them as illustrations in his 1905 article and *Fundamentals of Geology*.[232]

6.6.2 Contextomy Evidenced from Bailey Willis' Geological Report (Montana, USA)

Bailey Willis' 1902 geological report on the Lewis overthrust in Montana leaves no doubt of the nature as to the unconformity between rocks of the Algonkian Period (now an obsolete name for the Proterozoic Eon), the latter half of the Precambrian Era, (2.5 billion to 542 million years ago) and the Benton strata of the Cretaceous Period (145.5 to 65.5 million years ago). A quick glance at Willis' geological report leaves no uncertainty concerning the unconformity exposed at Chief Mountain (see also figs. 6.7 and 6.9). Price portrayed Chief Mountain as a prime example of evidence that there was no chronological succession pertaining to the fossils in sedimentary strata.[233] Thrust faults were to him 'inventions' of geologists to cover up evidence.[234] Figure 6.6 shows, besides the theoretical development of the Front Ranges since the Cretaceous, the observed geological structure from west (North Fork Valley) to east (Chief Mountain). The theoretical model of formation of the overthrust depicts the bending and breaking of the strata. Willis' section of the *observed* geological structure shows the Lewis thrust in the east near Chief Mountain. Price, however, states that the Cretaceous strata either dipped under the Palaeozoic limestone or underlay it horizontally with "occasional instances of minor disturbances here and there."[235]

Willis, based on his field observations, paints a much more dramatic picture of the effect of the overthrust. He described the observed disturbances as follows,

> The detailed structure of the Algonkian [Precambrian] mass above the Lewis overthrust is sometimes chaotic when considered in the small, yet simple when observed in the large. The chaotic structure is best exhibited in Chief Mountain, where the lower massive member of the [Precambrian] Altyn formation is crushed. The fractures divide the masses irregularly into blocks of all angular shapes varying from a few inches to 25 feet on a side. The surfaces are slickened [having evidence of slipping] over wide areas, and where they preserve their orientation in the cliffs the slickens [surfaces with a polished appearance and fine parallel scratches] demonstrate

232. Price, "XV. The Successive Ages (Concluded.)," 168.

233. Price, *Fundamentals of Geology*, 95.

234. Price, "XV. The Successive Ages (Concluded.)," 168.

235. Price, *Fundamentals of Geology*, 95

> much relative horizontal displacement of adjacent fragments . . . displacement has occurred in the direction of the strike rather than that of the dip.[236]

Willis thus clearly notes that there was immediately above the Lewis thrust a definite zone with evidence of deformation and internal thrust displacements (see figs. 6.7 and 6.9). Figure 6.7 shows minor diagonal thrusts in the lower member of the Altyn formation. Greater details of the diagonal and slightly concave minor thrusts, shown from a different angle, are also visible in figure 6.9 between the two major, near horizontal thrust planes, the basal Lewis thrust (BB) and an upper thrust (AA). The zone between thrust planes BB and AA is about 300-metre-thick but varies in thickness. Above this zone there were no notable dislocations. McConnell had similarly identified a layer of Cambrian beds (Castle Mountain Group) in Alberta that was broken and faulted above the Cretaceous shale.[237] The Cretaceous shale below the overthrust was of a much softer nature and therefore largely immune to the thrust faulting.[238] Where Price makes it look like there is no real deformation between the Cretaceous and the overlying Precambrian beds, McConnell and Willis provide detailed descriptions of observed deformation and displacement as evidenced by the fractured mass with slickens and minor thrusts in the lower Precambrian beds. The 300-metre thick basal zone of the Algonkian beds provide clear evidence of serious post-depositional disturbances. There is no doubt that the Precambrian beds as part of the Lewis overthrust evidenced significant horizontal displacement to produce the deformations.

6.6.3 Price's Narratives of the Thrust Faults

Price ignored major parts of the geological reports and aimed for a different conclusion. His selective extracting of fragments from their context clearly distorted the meaning that McConnell and Willis intended to convey. Despite the clear cross-sections, photographs, diagrams, and descriptions contained in the above geological reports, showing the thrust faulting, Price made his readers believe that the general picture was that Cambrian and Pre-Cambrian formations everywhere horizontally 'conformably' (without any signs of interruption in the sedimentation process) overlaid the much younger Cretaceous beds. Price tells the readers:

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236. Willis, "Stratigraphy and Structure, Lewis and Livingstone Ranges," 333-4.

237. McConnell, "Report on the Geological Structure," 31.

238. Ibid., 34.

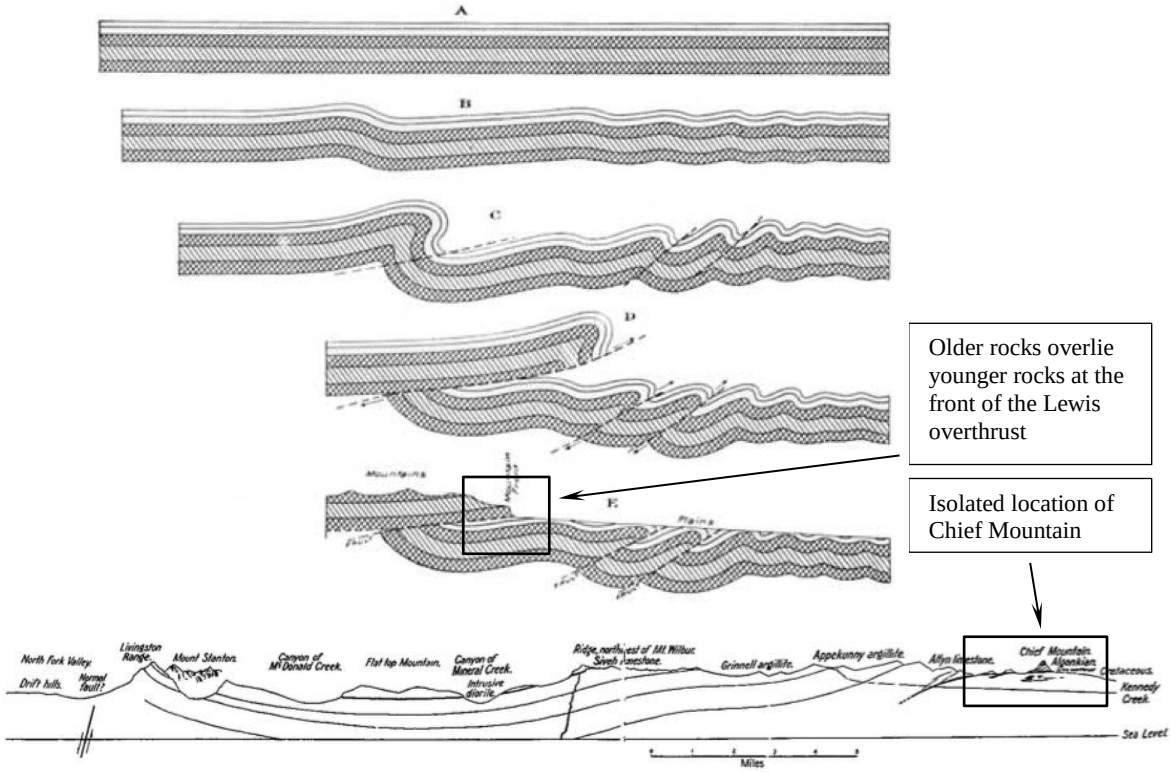


Figure 6.6. *Top,* Theoretical development [A-E] of the Lewis overthrust. Pressure from the northwest affected the rocks of the Glacier Park region (Montana). *Bottom,* east-west geological cross-section across the Front Ranges. Chief Mountain is located in the east. Through subsequent erosion processes Chief Mountain lies now isolated to the east of the main section of the Lewis overthrust. Frame and arrow show the location of Chief Mountain.

Source: Top, diagram taken from the visitor guide to Glacier National Park (Montana), 1937. *Bottom,* taken from Bailey Willis, "Stratigraphy and Structure, Lewis and Livingston Ranges, Montana," *Bulletin of the Geological Society of America* 13 (November 15, 1902): 338-9.

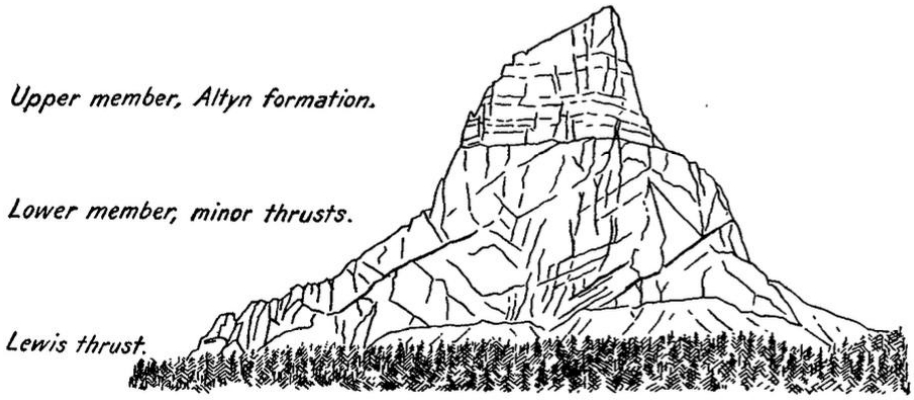


Figure 6.7. Chief Mountain looking north. Diagram shows the zone of minor diagonal thrusts in the lower member of the Algonkian (Precambrian) Altyn formation between the Lewis thrust (at the base of Chief Mountain) and the undisturbed upper member of the Altyn formation. Diagonal displacement is evident in the lower member (see fig. 6.9).

Source: Willis, "Stratigraphy and Structure, Lewis and Livingstone Ranges," 334.



Figure 6.8. Chief Mountain Lewis Range, Montana. Looking east along Chief Mountain ridge. The upper part of Chief Mountain shows the upper member of the Algonkian (Precambrian) Altyn limestone [Aa]. The Cretaceous Benton shale [Kb] is found at the foot of the cliffs, somewhat obscured by talus (pile of loose rocks at the base of the cliffs), underneath the Precambrian Altyn limestone.

Source: Willis, "Stratigraphy and Structure, Lewis and Livingstone Ranges," 330-1.

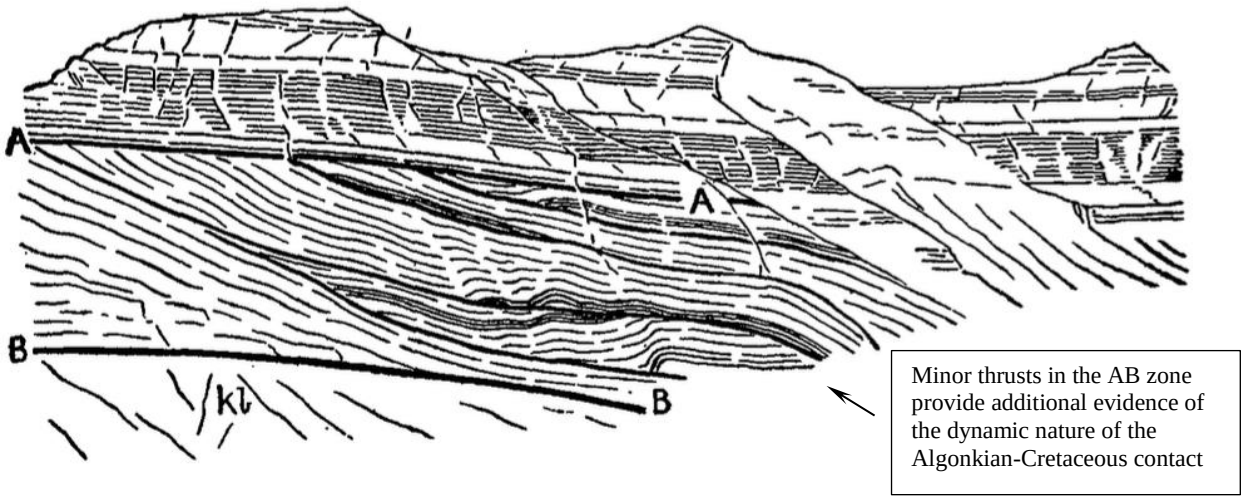


Figure 6.9. Structure of Yellow Mountain, drawn from photograph from Chief Mountain, looking east. BB is the main Lewis overthrust. AA is an associated parallel low-angle thrust within the Algonkian (Precambrian) Altyn limestone. Cretaceous Benton shale [Kb, b looks like l] underlies the Lewis overthrust and Precambrian Altyn limestone. The AB zone in-between the two major thrusts contains minor diagonal concave thrusts that cause localised repetitions of the Altyn limestone beds.

Source: Willis, "Stratigraphy and Structure, Lewis and Livingstone Ranges," 335.

> And all around these Cambrian or Pre-Cambrian limestone mountains, wherever the rivers have eroded the valleys deep down enough, they have laid bare the soft Cretaceous beds, which dip gently under the Palaeozoic limestone or underlie it horizontally, exactly like any normal stratification plane.[239]

This is a pertinent misrepresentation of the facts as represented by McConnell. His cross-sections clearly showed that most of the formations (except in the extreme eastern part) are generally dipping substantially towards the west and that the rivers have preferentially cut their valleys wherever the tilted softer Cretaceous beds were *at the surface*. Price's 1923 description of the same thrust fault became even bolder. He writes:

> But the valleys are all Cretaceous, wherever the rivers have dug out their channels deep enough; for Cretaceous strata run under the mountains in a nearly horizontal position from the front, or from the east; to the west of this area (as in the valley of the Flathead), the Cretaceous run under again as before. . . . The picturesque peaks of [Crowsnest Mountain and Chief Mountain], as well as the entire Glacier Park may well be described as Paleozoic islands floating on a Cretaceous sea . . . Were it not for the order in which the popular theory says that these strata *ought* to occur, no one would ever dream of anything else than that over all this area, the Cretaceous strata were laid down *first*, and these Paleozoic and Algonkian beds were laid down quite quickly and rapidly afterwards.[240]

Price suggests, more strongly now, that the Pre-Cambrian, Cambrian, and Cretaceous beds, lie in an essentially horizontally structural position with the Cretaceous formations at the bottom and the Cambrian and Pre-Cambrian formations at the top. This certainly was not the depiction in the geological reports that he used as the basis for his narratives (see fig 6.10 for a schematic representation).

There are some notable changes that occurred from 1905 onwards in the diagrammatic portrayal of the geological structure of the area. Initially, Price's 1905 illustration of the rock formations along South Fork of Ghost River was very much like Section D-C in McConnell's report (see fig. 6.5). Especially the Banff Limestone and Castle Mountain Group rocks showed, just like McConnell, a steep westward dip (inclination). It should be noted that McConnell's cross-sections included distinctly labelled fault lines which Price in 1905 doubted by inserting question marks in his illustration and subsequently totally omitted from the 1913 diagram. The heavily edited 1913 diagram in *Fundamentals of Geology* showed a much more gently undulating westward sloping contact between the older Cambrian and much younger Cretaceous rock formations. The impression was created that

239. Price, *Fundamentals of Geology*, 95.

240. Price, *The New Geology*, 629-31. Italics by Price.

the rock contact was conformable and nearer to the horizontal than McConnell had shown. In 1923 the diagram was no longer deemed necessary and was omitted from the discussion on thrust faults in *The New Geology*.

Not only the illustrations but also the descriptions of the thrust faults changed. In 1905, Price, "in fear of perverting the facts," had based the topic on quoted sections selected from McConnell's report to which he added a brief introduction and conclusion. Price informs the readers with a popular tone: "there is nothing here at all to indicate a real 'fault' save that some poor 'Benton fossils' (Cretaceous) happened to be deposited here."[241] He called the thrust faults, just like the earlier Barrande colonies, 'inventions' by geologists to misrepresent reality.

In *Illogical Geology* (1906), Price made only brief remarks on the thrust fault in Alberta, Canada. In *Fundamentals of Geology* (1913), the thrust fault description, accompanying the seriously edited illustration of the geological section along South Fork of Ghost River, had now become a lengthy amalgamation of selected quotes from the geological reports of McConnell and Bailey Willis with added Price's interpretations.[242] In *The New Geology* (1923) he wrote more concisely and confidently of his interpretation of the facts. With reference to the contact between the much older Paleozoic rock strata overlying the much younger Cretaceous strata at Crowsnest Mountain and Chief Mountain, Price notes that "the undisturbed character of most of these mountains is quite remarkable" and the "apparent conformability is perfect."[243]

Price's March 15, 1905, article is especially significant because it is a starting point for his evolving argument.[244] The 1905 to 1923 sequence of his narrations showed that with time he drifted further away from the original geological reports towards his desired Flood Geology interpretation. This observation is important because the Alberta-Montana thrust fault would become Price's flagship (but mistaken) argument for the non-existence of evidence for a rock-recorded succession of life. Convinced of his interpretation he writes, "I

241. Price, "XV. The Successive Ages (Concluded.)," 168.

242. Bailey Willis, "Stratigraphy and Structure, Lewis and Livingston Ranges, Montana," *Bulletin of the Geological Society of America* 13 (November 15, 1902): 305-52.

243. Price, *The New Geology*, 630-1.

244. Sometime between 1902, with no indication of thrust faults in *Outlines*, and this publication date, he must have started to develop this argument. In his article he mentioned that he found a book review in the *Nature* magazine of January 24, 1901, in which other gigantic overthrusts from the Alps had been discussed.

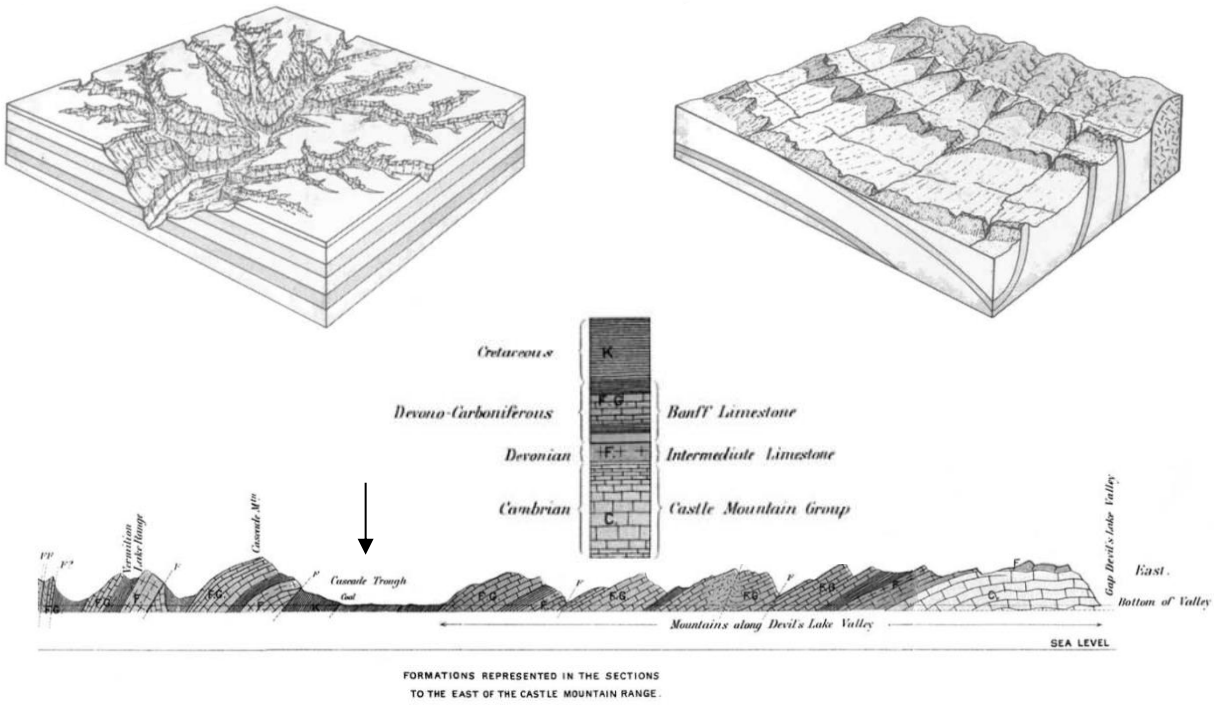


Figure 6.10. Orientation of rock strata and river incision. *Top left*, the effect of river incision in horizontal strata as suggested by Price in 1913 and 1923. Price inferred that Cretaceous beds were exposed by rivers cutting though overlying older Cambrian into the younger Cretaceous beds. *Top right*, the typical development of river incision in tilted strata, where rivers incise faster in softer rock strata (e.g. in Cretaceous shale as observed by McConnell. Valleys would preferably develop in tilted Cretaceous beds). *Bottom:* Fragment of McConnell's cross-sections with stratigraphic column as in figure 6.4. The large Cascade Trough valley (see arrow) has developed into softer rocks, including Cretaceous age beds.

Source: Top, Theoretical block diagrams from http://ocw.tudelft.nl; *Bottom*, McConnell's cross-section fragment from Raymond A. Price, "The Southern Canadian Rockies: Evolution of a Foreland Thrust and Fold Belt," Six-day field trip guide (Queen's University, Kingston, ON, 2000), 45.

don't know what would convince the world (that the rocks were really laid down in the order that we find them), if this evidence here in Alberta and Montana is insufficient."[245]

Price had specifically selected fragments of McConnell's and Willis' reports to concentrate on the particular sections where the rock strata were in the perceived original "wrong order," ignoring the dynamic context. To Price, the small sections contained enough evidence to judge that geologists could not be trusted and had covered up evidence of occurrences of reverse order of fossils by inventing "thrust faults." Not one experienced geologist agreed with Price's interpretation. Why did Price misrepresent the situation? Could

245. Price, *The Fundamentals of Geology*, 103.

this have been because without practical field work skills Price did not fully appreciate how geologists made use of primary field data to reach their conclusions? Alternatively, he may have sufficiently understood the reports but was so focused on the outcome that he wanted to see, that he willfully misrepresented the data.

6.7 Conclusion

Price was undoubtedly a keen and shrewd investigator, able to find the most obscure citations to support his arguments, a method that Alonzo Jones had successfully initiated before him. He was convinced that plain common sense reasoning more than equalled the complexity of the development of theories among the leading professional geologists. Price may well have been aware of the frailty of his arguments against stratigraphic geology but considered intellectual honesty less important than satisfying the requirements of a strictly literal interpretation of the six 24-hour Creation days and the geological relevance of the Genesis Flood.[246] He was gifted in building his arguments in a way that easily convinced people with limited or no skills in the science of geology. It should be noted that professional geologists were not his targeted audience. His aim was to make people aware of the threats of the evolution theory, to provide them with tools to counter evolutionist arguments, and to suggest a truly induction-based 'New Geology' that permitted a specific literal interpretation of the Genesis narratives.

Differences of opinion in the geological fraternity are normally resolved on the basis of field evidence. It is difficult to understand that Price, as Professor of Geology, never initiated any fieldwork-based research to once and for all prove the 'wrong order' of stratigraphy in his key argument, the overthrusts. If he could have eliminated the possibility of a dynamic cause for any occurrence of 'wrong order,' that would certainly have strengthened his case.

There is no doubt that Ellen White's metanarrative based on her 1858 vision regarding the creation of the earth is, as Numbers has pointed out, the motivating impulse behind his literary endeavours. Especially in *Outlines,* Price shows strict adherence to her descriptions of the Creation days and the Flood and the consequences of applying these to a catastrophist Flood interpretation of the formation of all fossil-containing rock strata. His

246. Numbers, *The Creationists*, 103. Numbers states that Price was no fool and suggests that we should understand his motives for combating evolutionary theory. Price had serious philosophical and moral objections to the evolution theory that he wanted to convey to his readers. This probably carried for him much greater weight than any scientific objections to his stratigraphic arguments.

later books no longer have that strong connection to the metanarrative but continue to deal with the consequences of her motivating influence. Besides Ellen White, there are significant influences of other authors recognisable in his texts such as that of David Lord, Alonzo Jones, and Henry Howorth (see fig. 6.11).

Price was definitely influenced by the writings of British scriptural geologists. However, their thoughts seem to have strengthened his ideas of a Mosaic Flood rather than initiated it. He had indicated that he had primarily been inspired by the writings of Ellen White[247] and probably later sought and found support for her views in the books of the British scriptural geologists. In *Illogical Geology* (1906) he strongly aligned himself with a particular thought of George Fairholme in relation to Fact Number Two (see footnote 140). In *Science and Religion in a Nutshell* (1923), he further mentions that he had 'recently' visited the Library of Congress and the United States Geological Survey library where he had read

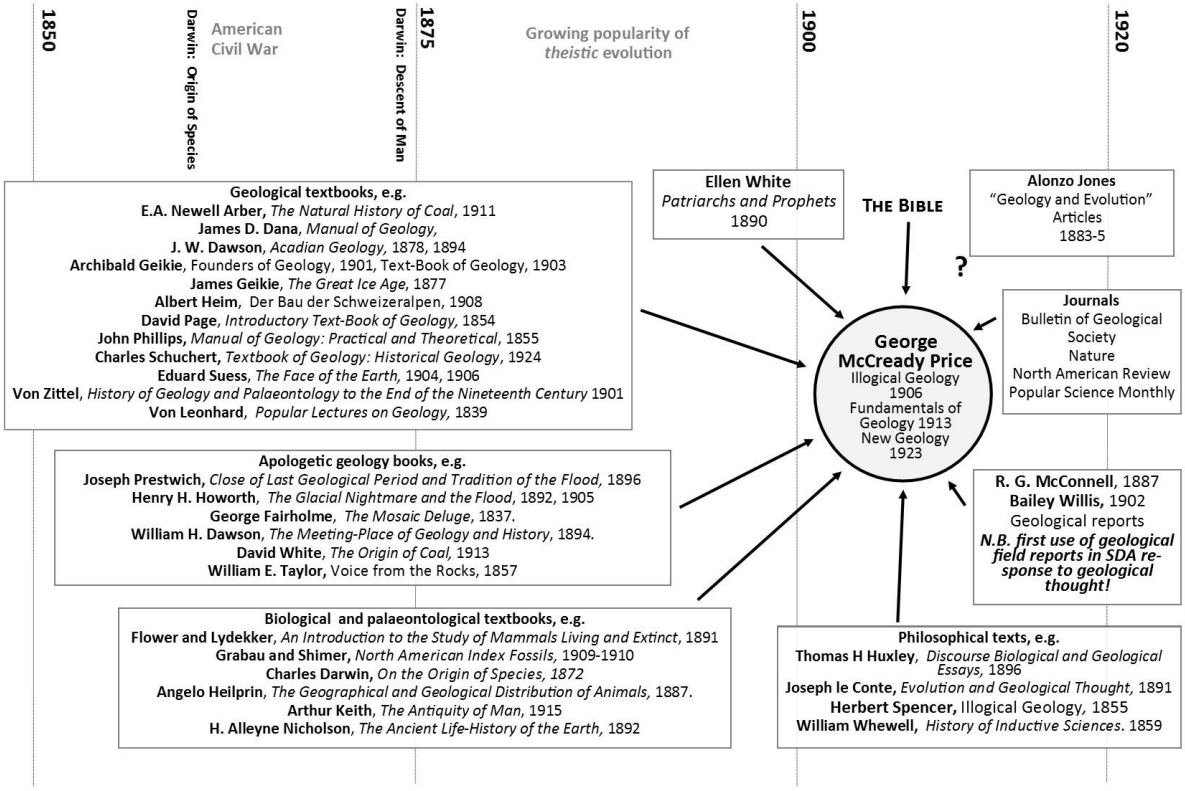


Figure 6.11. Diagram of major influences on Prices's geological writing

247. As early as 1901 Price mentioned the influence of Ellen White's writing concerning the geological changes at the Flood. See Price, "Some Scrap Quotations," 746.

many older books, "some dating back two hundred years or more," that dealt with geological changes caused by the Flood.[248] He also informed the readers that he personally owned two works of British scriptural geologists, who Warren Johns identified as Granville Penn (1825) and George Young (1838).[249] It is not clear when he acquired those.

Price's connection with the American scriptural geologists is less evident. Familiar thoughts can be identified but there is no hard evidence as had been earlier indicated by Stiling.[250] David Lord's influence on geological thought and the relationship between geology and the Bible has been well-reported (see chapter two). Half a century before Price, Lord had already suggested that geology should be stripped of assumptions and theories and be reduced to 'geognosy.' Geology should, according to him, be limited to "facts and truths that are ascertained by observation;" anything beyond this is "wholly beyond its sphere."[251] In a similar fashion, Price proposes that geology should let go of *a priori* assumptions and return to pure inductive methods to become an 'inductive geology' that does not deal with the formation of the world but strictly with its 'ruins,' the deposits laid down by the Flood.[252] Both authors point out the stark contradictions with the Scriptures, the unscientific nature of modern geology in general, and of circular reasoning more specifically.

Although Price never refers to him, the influence of Alonzo Jones' 1885 geology and evolution articles in *The Signs of the Times* is nonetheless tangible.[253] The lack of reference to Jones may be explained by Jones' widely reported apostasy later in life and the negative impact that would have had on any Adventist associating himself with such a person. After Price had started communications with the editors of the Pacific Press Publishing Association (and *The Signs of the Times*), Jones' argument of 'upside-down' mountains started to come through and eventually became a major showcase of how geologists invented solutions to deal with the wrong order of fossil evidence. There had been no mention of this in Price's *Outlines* (1902), but the topic started to appear in the 1905 precursor articles in *The Signs of*

248. Price, *Science and Religion in a Nutshell*, 7-8.

249. Ibid.; Johns, "Scriptural Geology, 1820-1860," 59, endnote 43.

250. Stiling, "Scriptural Geology in America," 187.

251. David Lord, *Geognosy*, 60-1.

252. Price, *Illogical Geology*, 83, 85.

253. Alonzo Jones discussed "huge mountain masses [that] are lying in a directly overturned position," in: "Uncertainty of Geological Science. (Continued.)," *Signs of the Times* 11, no. 20 (May 21, 1885): 308.

the Times of his soon to be published *Illogical Geology* (1906).[254] In *The Fundamentals of Geology* (1913), Price would next report his greatly increased knowledge of the 'thrust faults' in Montana and Alberta. The expanded chapter on the matter now included textbook-like photographs, cross sections, and a sketch. In *The New Geology* (1923) textbook his disbelief of 'thrust faults' would be further exemplified with bolder statements and numerous photographs.[255] What is the consequence of the misrepresentation in Price's argument, especially since it found its way into Whitcomb and Morris' twenty-first century edition of *The Genesis Flood*?[256]

Compared to Jones, Price's writing shows a progressive development from earlier ideas such as those expressed by Lord. Price's books were more focused on examining the so-called evidence for the invariable order of the fossils. It seems, therefore, that especially in *The Signs of the Times,* from 1879 to 1905, a progressive trend can be identified from the earlier David Lord reprints, via Jones' geology and evolution articles to the developing oeuvre of George McCready Price. Another notable influence was the writing of Henry Howorth and his thoughts concerning the unlikely occurrence of a 'Glacial Nightmare' as compared to the factual biblical universal Flood; the call for a removal of *a priori* theories; and a stricter inductive approach to geology. Price makes frequent reference to Howorth and places a favourite quote from Sir Henry Howorth's *The Glacial Nightmare and the Flood* squarely on the title pages of both *Illogical Geology* and *The Fundamentals of Geology*.

Why was this sequence of articles more visible in the *Signs of the Times* than in the *Review and Herald* during the same period? Was it simply because Price lived on the West Coast? Alternatively, was it because *The Signs of the Times* newspaper was the missionary periodical, intended for a wider audience? Was it, possibly, the preferred newspaper through which the Adventist pioneers wanted to alert the world to the blatant infidelity of the evolutionary sciences? Was it perhaps deemed that such a type of message could convert more people to Adventism? A popularised portrayal of geology and evolution with an appeal to common sense, presented with frequent cynical and satirical undertones, would have undoubtedly interested the average person in the street. The influence of the magazine's

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254. George McCready Price, "XV. The Successive Ages," *Signs of the Times*, 31, no.11 (March 15, 1905): 168-9; "Chapter V. Turned Upside Down" in *Illogical Geology*, pp. 27-30.

255. Price, "Chapter XXXVIII. Do the Fossils Occur in Chronological Order," in *The New Geology*, pp. 610-643.

256. John C. Whitcomb and Henry M. Morris, *The Genesis Flood: The Biblical Flood and its Scientific Implications*, 60th anniversary ed. (Phillipsburg, NJ: R & R, 2011), 184-200.

editors, firstly Joseph Waggoner and later Milton Wilcox, was also an important factor. Waggoner had recruited Alonzo Jones, and Wilcox was the one who had spotted the talents of Price in combating evolution theories that threatened Adventist doctrine.

It must be realised that Price's articles were clearly not meant for academic discussion but were intended to connect with the lay public through the use of simplified dichotomous either-or contrasts of perceived weaknesses in the sciences. Especially Price's regular weekly contributions just after the turn of the century would have attracted the attention of the casual reader who did not have exposure to the original scientific material. It is clear that Price was convinced that he had to alert the people to the dangers of the infidelity of the evolutionary sciences and to impress upon them instead the security of the infallibility of the literal meaning of the word of God.

Price's body of apologetic literature that promoted a 'New Catastrophism' sacrificed and misrepresented fundamental geological principles in order to endorse Ellen White's metanarrative of the biblical Genesis account. Price's deconstruction of standard geological principles, as established by professional geologists, proved to be highly flawed. In trying to understand this, it should be remembered that Price was, first of all, a committed Adventist who believed that he was living literally in the last days of the earth's history and that Christ would soon appear.[257] Also, Price was totally convinced that the evolution theory was scientifically unsound and his geological arguments, he believed, proved that. Price's geological texts are therefore based on a desire to provide evidence for his interpretation of the biblical Creation and Flood accounts by showing the impossibility of a proven succession of life. This was important for maintaining Adventist theology as developed during the 1850s. The reality of the universal Flood served, as Ellen White had argued, to warn people of the imminent terrible conflagration prior to Christ's Second Coming.

Although it is indeed laudable to aim to strengthen people's faith in the Bible, it is questionable whether this should be accomplished through an attractive veneer of logically knitted arguments that - at best - provide a partial reflection of their intended meaning. While this may not be consequential for orthodox Christians that prefer a literal reading of Scripture in a home or private setting, it may become a problem for young people who may at some time get exposed to the wider scientific aspects of Price's seriously flawed arguments. So persuasive in fact were Price's texts, that he convinced not only most Adventist readers but

257. Numbers, *The Creationists*, 103.

also an increasing section of orthodox Christians keen to hear geological explanations that matched their biblical interpretations. On the other hand, Price's arguments progressively irked the body of professional geologists, convinced that his writings discredited the academic standing of their science.

Price's geological arguments sharpened over time which is most apparent when tracing his thinking on perceived flaws in stratigraphical geology. With that sharpening, they also became more critical of the stratigraphical theory developed by the growing body of scientific geologists. The chasm widened because of contrasting perceptions of the purpose of geology. Price saw a supporting role for a purely inductive form of geology to confirm his literal and inerrant interpretation of the biblical Genesis account; geology in the service of biblical interpretation. Contemporary professional geologists pursued a naturalistic 'grass-roots' geology based on the results of field observations independent of (but certainly not aimed against) biblical thought.

It has been an aim of this chapter to provide the unfolding, context, and background for understanding Price's geological arguments. Price's extensive writing provides a 'gold mine' of fairly well-referenced arguments for interested persons to further evaluate the context of their own faith. Each carefully selected quote that Price unearthed from the many resources that he perused deserves further in-depth evaluation. Within the larger perspective of the engagement between geological and Adventist thought within the 1850 to 1925 timeframe, Price's contribution was certainly the most academic and the most comprehensive but *also* the most deserving of a further evaluation of its long-term impact.

Chapter 7
Conclusion

> Total objectivity is an illusion which can never be achieved.
> —Gunnar Myrdal, as cited in "Problems of Objectivity."

> *C'est ce que j'ai vu*. [This is what I have observed.]
> —Joachim Barrande[1], *Systême Silurien du Centre de la Boheme*.

7.1 Chapter Introduction

This study set out to explore the nineteenth century engagement between geological and Adventist thought and its impact on the twentieth century Flood Geology movement. Contrary to previous studies that have looked at more general aspects of science and Adventist faith, this study has sought to do this from an in-depth geological perspective. Ever since Ellen White, the denominational co-founder labelled geologists 'infidels' because of their old age earth perspective and their infidel suppositions that threatened the foundation of the seventh-day Sabbath, geology has continued to be perceived as a false science because it clashed with a literalist interpretation of Genesis 1. Geology was seen unfit to be called a true science because it conflicted with biblical views and was different from other sciences. Because of her charismatic authority Ellen White's statements on geology carried credence far into the future and strongly influenced later Adventist writers. Later writers seriously questioned the scientific nature of geology because it was not perceived as demonstrative like mathematics and physics but seemed to be based on wild assumptions and inferences. This observation raised a number of questions. How well did the Adventist writers reflect the true endeavours of professional geologists? Was geology a threat to Christianity in general or specifically to Adventist beliefs? How should we regard the Adventist responses to nineteenth century geology from a twenty-first century perspective?

The aim of the study was to evaluate the nature of the thought engagement between Adventism and geology and to examine the legitimacy of geological statements that were

1. Joachim Barrande (1799-1883) strongly believed in the hypothesis of his 'colonies' as precursors of fossils. In the face of alternative hypotheses, he remained committed to what he had observed. His motto, '*c'est ce que j'ai vu*', which was written on the title page of each of the 22 volumes of *Systême Silurien*, expressed this strong belief in the correctness of his hypothesis.

made by Adventist writers. It therefore considered the state of geology within the nineteenth and early twentieth century context and sought to answer more specifically the following questions:

1. To what extent did the Seventh-day Adventist writers understand the nature and findings of the science of geology?
2. What was the impact of Seventh-day Adventist belief on their evaluation of geological literature?

7.2 Synthesis of Findings

7.2.1 Adventists' Understanding of the Science of Geology

Text analysis of the writings of the identified Adventist key role players in this thought engagement has shown that the four authors portrayed a variable understanding of the nature of the science of geology. There is a notable disparity in the level of that understanding which increased markedly from the mid-nineteenth century to the early twentieth century (see Table 7.1). The mid-nineteenth century authors, Ellen White and Uriah Smith, both based their knowledge of the nature of geology solely on secondary sources.

Ellen White revealed in her writing cognisance of mainly pre-nineteenth century ideas that had long been abandoned by mid-century and an aversion to explaining the work of creation in terms of natural causes. Through familiarity with the writings of John and Charles Wesley there was a notable Methodist influence in Ellen White's writing. In contrast, Uriah Smith's identifiable sources were of a more recent nineteenth century contemporary nature. His earliest writings in the *Review and Herald* of 1853 show a strong Baconian perspective of the sciences which can also be identified in Ellen White's 1864 *Spiritual Gifts* metanarrative. This raises the possibility that Smith potentially influenced Ellen White's developing ideas.

It is particularly noteworthy that Uriah Smith introduced contributions from orthodox Christian (especially Presbyterian) sources outside the Adventist church to guide the engagement between geological thought and Adventist theology. At a time when Adventism lacked a cadre of trained specialists to deal with the impact of geological thought this was apparently not a problem. Twenty-first century Adventism is not as dependent on such inputs from other Christian denominations.

Alonzo Jones, who wrote during the last quarter of the nineteenth century, was the first Adventist author to base his evaluation of the nature of geology on a geological contemporary textbook which he studied with strong skepticism and with the intention to find flaws in geology's nature and methodology. His evaluation of Geikie's textbook shows his

strong commitment to finding flaws in the text but with no intention of wanting to understand the positive aspects and the inherent intellectual modesty of the geologists' methodology. Jones' use of contextomy provided a foundation for McCready Price to continue and build upon this habit. The use of contextomy in the thought engagement by Jones introduced the question of intellectual integrity in the engagement process.

Price was by far the best informed author who not only searched a multitude of textbooks but in addition examined some geological field reports. However, despite the abundance of source materials, Price failed to grasp, or at least to report, the true essence of what inspired professional geologists in their work and in the presentation of their findings. Price evaluated geology without ever experiencing the critical fieldwork component that stimulated professional geologists. This disconnection with reality and his total reliance on second-hand knowledge allowed him to pose wild hypotheses. The absence of involvement in first-hand observations to support his ideas also remained a major stumbling block for any acceptance of his interpretations beyond orthodox Christian circles. If Price could have produced field evidence for his ideas he could have won some respect from professional geologists. But this probably showed his limitation as Professor of Geology. It is indeed

Table 7.1. Significant contributions by the key role players in the engagement between geological and Adventist thought (1850-1923).

Ellen White (1864)	**Uriah Smith (1855-1903)**	**Alonzo Jones (1883-5)**	**George McCready Price (1902, 1906, 1913, 1923)**
States guidance by Divine inspiration. Identifiable influences from historical persons and contemporary texts. (see fig. 3.2) Charismatic authority reaches far into the future	**Abundant input of material from orthodox Christian sources outside Adventism to evaluate geology.** (see fig. 4.3) Apparent preference for texts from Presbyterian ministers. Applies Baconian common sense philosophy in dealing with geology Longevity as editor of *Review and Herald* periodical	First Adventist author to use a contemporary geological textbook to evaluate the science of geology. (see fig. 5.3) Questions geology's hypothetic nature and 'upside-down' mountains Considers geology a non-demonstrative science First elder to link geology with evolutionary theories First evidence of contextomy in finding flaws	Targets illogical geology as the weakest link in the evolutionary theory. Questions validity of stratigraphical principles and formulates alternative stratigraphic law. Identifies thrust faults and Ice Age as inventions by geologists. Uses many geological and biological text books as well as first-hand geological reports to evaluate the science. (see fig. 6.11) Applies severe contextomy to oppugn professional geology and to justify his Flood Geology. **Influences Orthodox Christians outside Adventism in accepting Flood-based geology**

strange that over a period of almost five decades he tried to convince his audience of the paucity of evidence for key geological ideas like the geologic column through his books and articles without the backing of any field work. The answer seems clear: Price's motivation, different from that of the professional geologists, was to defend the authority of the literal statements of scripture over and against facts of field evidence. His extreme Baconian perspective valued biblical facts much higher than the assertions of geologists. The construct of his Flood Geology theory was based on a literal interpretation of Scripture augmented by perceived support mined from renowned academic literature. In the process, Price would apply contextomy in an even more extreme form than Jones before him.

This research has shown that during the 1850 to 1923 period intellectual integrity was increasingly surrendered in dealing with the impact of geological thought. This practice would negatively impact their work on the evaluation of geological thought. Their evaluation should have included *both* the negative and the positive features of geological thought in a more objective fashion. Experience teaches us that any imbalance in historical scientific narratives tends to be corrected in the long run (the case of Lyell and his skewed representation of the work of Werner may serve here as an example).

Ellen White stands out amongst the four key persons examined because it was her charismatic authority linked to her prophetic experiences that stimulated the involvement of the other three authors. She was the driving force in this process. Many of Uriah Smith's editorial articles of a geological flavour scaffolded Ellen White's thoughts with the impact of geological thought on Adventist theology (see chapter 4). Alonzo Jones clearly echoed Ellen White's thinking on the natural sciences and geology in particular (see chapter 5). Jones unmistakably showed that evolution was based on the flawed naturalistic arguments of the science of geology. McCready Price praised Ellen White's metanarrative as his inspiration and incorporated her ideas quite literally in his *Outlines* and more nebulously in his later books.

7.2.2 Impact of Adventist Belief on the Evaluation of Geology

Although the Seventh-day Adventist Church was not the only orthodox denomination to skeptically react to modern geological thought, the impact for Adventism was to be more intense and long-lasting because of its specific theology. The Sabbatarian Adventists felt that two major aspects of their central beliefs were challenged by the new science of geology: their belief in the relationship between the global catastrophic Mosaic Flood and the cataclysmic events prior to the Second Advent of Jesus Christ, and their belief in the

observance of a seventh-day Sabbath. The belief in the imminent Second Advent of Jesus Christ is linked with the scriptural warning of cataclysmic events just prior to that. Ellen White had emphasised the metaphor of the world-wide Mosaic Flood catastrophe to warn the people of the coming conflagration at the end of time. However, by mid-century, the professional geologists, including the harmonising geologists, realised that what they initially had interpreted as surficial diluvial gravels and boulders were now interpreted as glacial deposits linked to the Ice Age. The resulting diminishing belief in a geological deluge brought increasing doubt to the reality of a world-wide catastrophic Mosaic Flood. If there was no evidence of a Flood this would diminish the flood metaphor for warning the people of the coming conflagration.

At the same time that the geologists experienced a diminishing belief in a world-wide geologic deluge, Ellen White, in a reaction to this trend, returned to seventeenth century 'geological' concepts to reignite the belief that not only the surficial deposits but *all* geological deposits had been reworked by the Flood. Such a Flood explained not only the fossil containing rock formations but also the internal storage of organic matter to act as fuel for future volcanic and earthquake activity to herald the Second Coming of Jesus Christ. Her thoughts were not unique but concurred with those of American scriptural Geologists. McCready Price would at the beginning of the twentieth century use Ellen White's ideas to develop his Flood Geology theory and find support in the writings of nineteenth century British scriptural geologists. Price would however strongly deny the occurrence of an Ice Age and explain that as an invention by the geologists.

Geological ideas would also seriously challenge Adventists' adherence to the seventh-day Sabbath. The nineteenth century professional geologists increasingly believed in an old earth, certainly much older than the six 24-hour Creation days and the estimated 6000 years since then. For Adventists who held to a literal interpretation of the Creation account, the biblical account was impossible to rhyme with an old age earth. If the six days had been six very long periods, as harmonising geologists suggested, what did this mean for the length of the seventh-day? Ellen White's metanarrative contained her vision of having been taken back to the time of Creation in which she was shown that God performed the work of the creation in six days and rested on the seventh day. That Creation week, she said, was just like every other week. Ellen White's narrative reinstated for many the trust in the biblical Creation account that had been shaken by the geologists' assertions. She stated that the 'infidel supposition' that the events of the first week required seven vast indefinite periods undermined the basis of the Sabbath of the fourth commandment. The importance of Ellen

White's Sabbath argument was echoed by later Adventist authors including Uriah Smith, Alonzo Jones, and McCready Price.

7.3 Theoretical implication

It is suggested that the geologists' intended ideas of this period should be revisited and more fairly communicated to interested persons that struggle with the received message. Maintaining intellectual integrity in communicating the results of important evaluations is fundamental to the success of the process. The most significant early twentieth century communicator in the engagement between geological thought and Adventism was undoubtedly George McCready Price. He held a fundamental position of trust in bridging the contrasting worldviews between geology and Adventism and in communicating his findings to the lay congregation (see fig. 7.1). At the beginning of the twentieth century, Price was the only Adventist spokesperson that had invested abundant time and resources in evaluating the new science of geology. He 'lived' the Adventist worldview and developed an understanding of geology, albeit without its critical practical component. Price functioned as the dominant filterer or gatekeeper in the communication process who chose what to use to inform the lay congregation who, by and large, had no substantial knowledge of geology. He used a cherry-picking approach to build his negative representation of the findings of the global body of professional geologists. Whilst the geologists used a multiple working hypotheses approach to build their knowledge base, Price translated this with a Baconian common sense approach and strict apologetic intent to a denomination that favoured a literalist reading of Scripture.

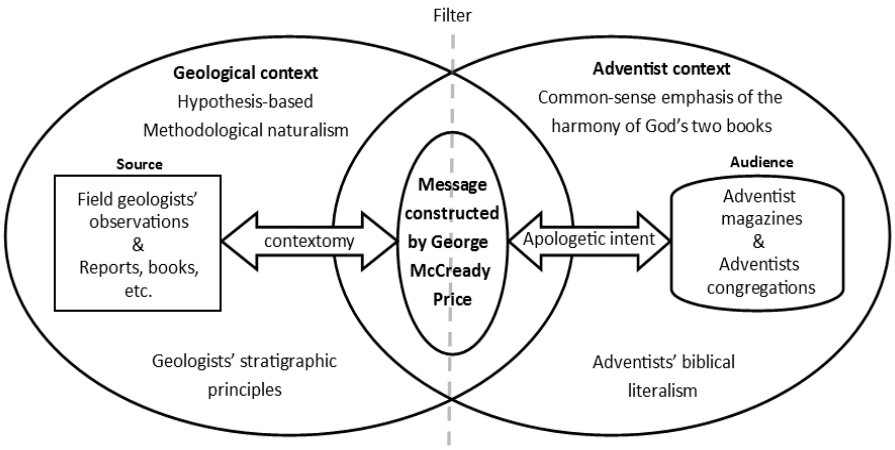


Figure 7.1. A model for bridging contrasting worldviews between geology and Adventism.

Price especially attempted to demolish the geologists' pragmatic stratigraphic principles in the process to argue for a catastrophic single biblical Flood.

The result of an imbalanced communication process is that the receivers of the message build an image of the subject that differs substantively from the original source (see fig.7.2). Every step in a communication process affects the original message. Within the geological sphere the message changes as it is passed on from the initial observations in the field to its communication to a wider audience. In the case of the engagement of geological thought and Adventism, major analysis and synthesis took place to bridge the two worldviews to reach its Adventist audience. There arises a danger when the communicator filters the message so much through his own worldview that it clouds the communication process. In that case the audience hear mainly the communicator's biases and they do not fully grasp what was originally intended.[2] This may apply to the perception of geology by the

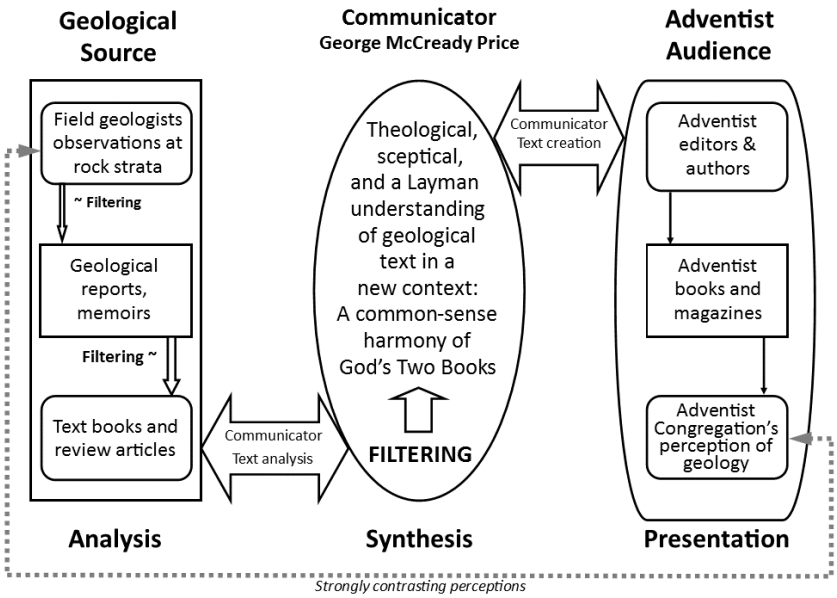


Figure 7.2. A tentative communication model: from a field geologist's perspective to an Adventist layman context.

Source: This diagram was adapted to geological thought and Adventism from a diagram on the technical dimensions of appropriate communication in: R. Daniel Shaw and Charles E. van Engen, *Communicating God's Word in Complex World: God's Truth or Hocus Pocus?* (Lanham, MA: Rowman and Littlefield, 2003), e-loc. 2393 of 5101.

2. See R. Daniel Shaw and Charles E. van Engen, *Communicating God's Word in a Complex World: God's Truth or Hocus Pocus?* (Lanham, MA: Rowman and Littlefield, 2003), e-loc. 2393 of 5101.

Adventist congregation. This research argues that the received message by the audience starkly contrasts with the intended message of the field geologists.

The skewed reportage certainly did not diminish the popularity of Price's writing. His books also started to convince many believers within wider orthodox Christian circles of the usefulness of Flood Geology in dealing with both geology and Scripture. We see here a reversal in information flow to influence thinking on geology and Christianity. Uriah Smith, as editor of the main Adventist periodical had during the nineteenth century *imported* external orthodox thought on the impact of geology on faith into Adventism. George McCready Price during the twentieth century through the popularity of his books *exported* from within Adventism thoughts on the interaction between geology and faith to believers of other Orthodox Christian denominations (see Table 7.1 and fig. 7.3).

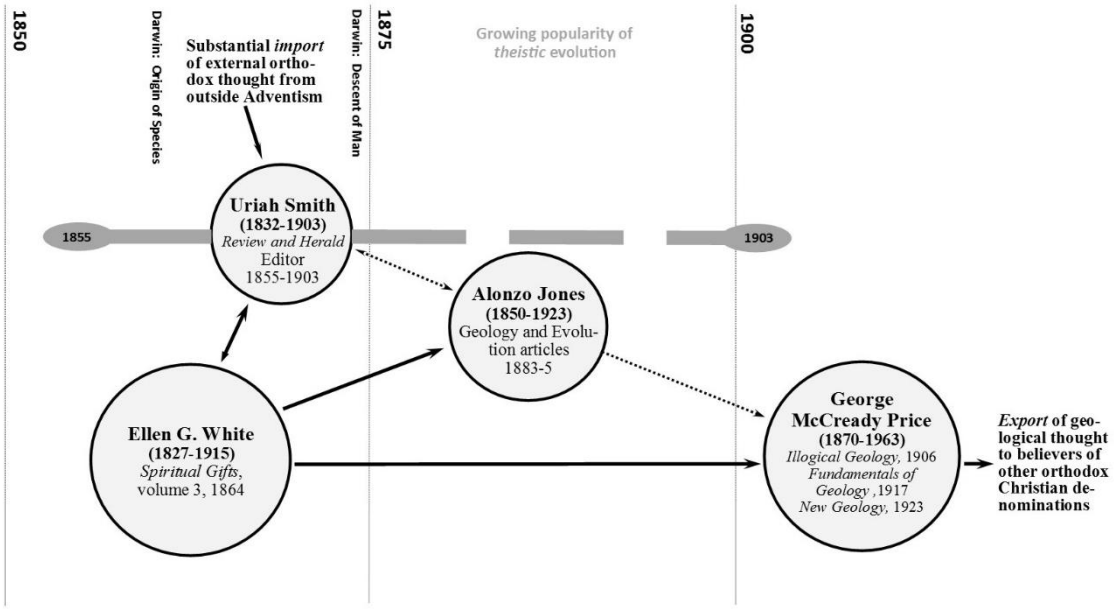


Figure 7.3. Key role players, communication pathways and external connections during the 1850-1923 Seventh-day Adventist response to geological thought.

This research has focused on the context and validity of the impact of geological thought on Adventism and recommends an attempt by both geologists and orthodox Christians interested in the interaction to develop a greater understanding of each other's thinking and apply intellectual fairness in the process to achieve this. Although 'absolute objectivity is an illusion', this thesis provides opportunities for a person to do this at any point in the engagement process. One may ponder over what Price's skewed presentation of

the methodology and findings of the nineteenth century geologists means to the people that took Price's writing as a correct reflection of the geologists' thinking?

7.4 Recommendation for future research

This thesis presents major trends in the early engagement process but certainly is not the complete story. The assigned length of the thesis limits a fuller presentation and greater depth on various aspects of the engagement. There is enormous scope for intensifying research on various aspects. This thesis has revealed that:

- There is a need to develop a greater understanding of the motivations of the key persons and their interactions as it relates to this engagement. Such understanding must come from reading their personal thoughts as expressed in letters and notebooks which are held in special library collections. A preliminary analysis of letters tends to suggest a paucity of geological talk but further research is needed in this area.
- There is a need to develop a greater understanding of the role of the Adventist ministers in this thought engagement. Sermons were frequently reprinted in the *Review and Herald*. On occasion they dealt with geology and evolution. Their viewpoints should be analysed and compared and contrasted with those of the key role players. How effective were the ministers' sermons in informing the congregation as compared to the written word?
- There is a need to analyse further the role of the two major editors of *The Signs of the Times* magazine in the engagement process during this time period. J. H. Waggoner and M. C. Wilcox played an important role in steering the discussion on geology and evolution and recruiting authors for magazine articles.
- There is a need to analyse in greater depth the context of the newspapers and magazines that the key persons read to form their opinions on topics. Especially the New York *Independent* got frequent mention as sources of information in geology and evolution articles.
- There has arisen a need to further investigate the nineteenth century perception of actualistic geological hypotheses among American scriptural geologists and Adventist authors in light of the demonising of Charles Lyell and uniformitarianism that started early in the twentieth century in Adventist literature.

- The implications of this research for the Adventist audience into the twenty-first century needs exploration. For example, has the Adventist understanding of geology changed since 1923?

7.5 Limitation of the study

The research has encountered some limitations in data collection because of physical distance to libraries in the United States where important source material (letters, notebooks, etc.) is held that can only be viewed through visiting the premises. This needs to be done by the main researcher and cannot be easily handed over to hired help because the clues are often subtle and influences the direction of such in-depth research. There have also been some financial restraints on data sources such as those with paid access to digitised nineteenth century American newspapers. Key persons in this research referred frequently to newspapers that influenced their thinking on the topic. There is a need to investigate this further. Nonetheless, this research has been an enormously positive experience where available access to libraries and financial resources have interacted to direct the research in ways that have led to new insights.

7.6 Final Conclusion

This thesis set out to fill a gap in the nature of the thought engagement between Seventh-day Adventism and geology in the nineteenth century and to evaluate its impact on early twentieth century Flood Geology. The research wanted to determine the extent to which Adventist authors understood the nature and findings of contemporary professional geology. This research has shown that there was very little understanding of the nature and findings of this science among the authors; most sources used to determine the impact of geology were of a secondary nature; severe contextomy hindered the communication of the geologists' findings; adhering to a literalist interpretation of Scripture was of greater importance than retaining intellectual integrity in the evaluation process; and the lay congregation's view of nineteenth century geology strongly contrasted with the thoughts of professional geologists. This research provides access points for interested people to first-hand resource material to become cognisant of what really happened in this fascinating period with geology and Adventism and their engagement.

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Appendices

Appendix A

The occurrence of the 'geology' term used in the *Review and Herald* between 1850 and 1910. Based on Seventh-Day Adventist Church General Conference – Office of Archives, Statistics, and Research - Online Document Archives, 2012.

Author[1]	Article title [Most relevant issue for this research] (frequency of 'geology' term used)[2]	Chief editor	Article type	Date journal published	Vol./no., page no.
Anonymous (Horatius Bonar)	**The Present Age; Its boasted progress delusive.** From *London Quarterly Journal of Philosophy*. "For all science is a lie – or at least lodges a lie in its very core – if apart from God and His Christ" (**1**)	James White	Reprint	February 28, 1854	05/06, 41
Anonymous	**Geology.** Problems with geology are not with their facts, but with the *use* of it and their *conclusions* (**8**)	Uriah Smith	Commented reprints	December 16, 1858	13/04, 28
J. H. W. (J. H. Waggoner)	**Is Sunday the True Seventh Day.** From the *Wesleyan*. Geological essays as 'sciences falsely so-called' make the Bible a mere toy (**1**)	Uriah Smith	Edited reprints	January 27, 1859	13/10, 76
Dr Cumming	**Science and the Bible.** "The Bible was not written to teach science, . . . "when it does refer to science it is always correct" (**0**)[4]	Uriah Smith	Book discussion	February, 24, 1859	13/14, 107
M. E. Cornell	**Philosophy vs. Bible Truth** Prof. Schuyler, "The Human Soul; its nature and future existence." The pamphlet is a mere display of human wisdom and vain reasonings in philosophy and science falsely so-called (**1**)	Uriah Smith	Pamphlet discussion	April 7, 1859	13/20, 153-4
Daniel T. Bourdeau	**The Sabbath did not Originate with the Jews.** Geology as a science is not wrong, but science falsely so-called makes the word of God of none effect (**5**)	Uriah Smith	Original article	August 11, 1859	14/12, 93-4
B. M. Adams	**Immortality of the Soul.** Now-a-days, professors of theology and geology are not held in very high credit (**1**)	Uriah Smith	Letter to Bro. Smith	January 12, 1860	15/08, 62
William Swan Plumer, D. D.	**Geology.** From *The Bible True and Infidelity Wicked* "The first verse of Genesis may relate to a period millions of ages prior to the events noticed in the rest of the chapter" (**8**)	Uriah Smith	Reprint	July 3, 1860	16/07, 49
G. W. A. (George W. Amadon	**The Skeptic Met.** Geology is still in its infancy. "As a science it is not demonstrative, and its oracles are contradictory and clash with each other" (**3**)	Uriah Smith	Commented reprints	September 4, 1860	16/16, 121-3
Daniel T. Bourdeau	**Truth vs. Spiritualism.** Bourdeau answers questions of Mr Potter, a spiritualist. "We have nothing against the *genuine* science of geology; but" ...solemnly "protest against science falsely so-called" ... (**6**)	Uriah Smith	Lectures discussed	January 8, 1861	17/08, 62-3
Anonymous	**Are Miracles Precluded by the Laws of Nature?** From the *American Baptist*. The 'merely intellectual believer' is harassed with doubt and anxiety from new discoveries of geology, astronomy, or history. (**1**)	Uriah Smith	Reprint	January 29, 1861	17/11, 81-2
Anonymous	**Infidel Objections.** From *Abbott's Magazine*. [Infidel tracts are extensively circulated. We have no fears for Christianity. When was *the beginning?* Moses says not one word on the subject.] (**2**)	Uriah Smith	Reprint	March 12, 1861	17/17, 129-30
J. N. Loughborough	**Scripture Account of the Flood, Vindicated.** From Horne's Introduction to the study of the Bible. Frequently ridiculed; the Deluge is well attested by natural and civil history. (**1**)	James White	Commented reprint	October 29, 1861	18/22, 173-4
J. Clarke	**The Map.** "The map shows the earth in ruins." With new discoveries in geology, "new theories are formed, and old ones exploded." "Then cavilling geologists will be dumb, and the earth be mapped anew" (**1**)	James White	Appears reprinted	February 11, 1863	21/11, 86
Anonymous	**Characteristics of the Last Days.** From the *Advent Herald.* Geology as "a professed science, which is but from yesterday ... brazenly assails the testimony of the holy writ." The spirit of infidelity is rampant. (**2**)	James White	Reprinted	July 7, 1863	22/06, 41-2
S. P. Leland	**Letter from S. P. Leland.** Addressed to Moses Hull. You acknowledge that geology, if true, opposes the Bible. However, the revelations of geological science exemplify the divinity of the Scriptures! (**2**)	James White	Original	July 21, 1863	22/08, 61-2
Anonymous	**The Renovation of the Earth.** From *Lectures on Daniel* with a selection of authors: Thomas Dick, James D. Dana, and Charles Lyell. "The cross must lead us to the crown." (**2**)	James White	Reprint	January 5, 1864	23/06, 41
(Horatius) Bonar	**The Present Age: Its boasted progress delusive.** Same article as printed in February 28, 1854. "The mental philosophy of the age is ... often stumbling in Skepticism, Pantheism, Atheism." (**1**)	James White	Reprint	February 9, 1864	23/11, 81-2
G. (E. B. Gaskill?)	**Geology and the Bible.** From Turner and Malte-Brun. 'They' oppose science against revelation; use the "dreamy, incoherent utterances of geology." Speculative geology oversteps evidence of facts. (**5**)	Uriah Smith	Commented reprint	October 17, 1865	26/20, 157
G.	**The Blunders of Geologists.** From the *Evangelical Repository*. The Ten Commandments and sanctity of the Sabbath denied because of notions of granite infusions and ancient existence of elephants and hyenas. (**14**)	Uriah Smith	Introduced reprint	October 24, 1865	26/21, 161-2
R. F. Cottrell	**"A Very Materialistic Christianity."** Elder Cottrell to the *N. Y. Independent* editor. [We are not a materialistic religion. We don't see the seven days as geological periods. We are aware of infidel geology. (**1**)	Uriah Smith	Reprinted letter	November 7, 1865	26/23, 181-2
Marshall Edson	**From Bro. Edson.** Letter to 'Brethren and Sisters.' A Universalist preacher mentioned, according to science and geology there was death before man was created. Thankful for the light of truth. (**1**)	Uriah Smith	Letter to editor	January 30, 1866	27/09, 71
D. T. Bourdeau	**Geology and the Bible; or a pre-Adamic age of our world doubtful.** Much of geology is 'science falsely so-called. Refers to extracts from Joshua Priests' *The Wonders of Nature and Providence.* (**11**)	Uriah Smith	Original article	February 5, 1867	29/09, 98-9

F. W. Gotch	**The Conflagration of the Earth.** Reference to 2 Peter 3:10. Geology confirms that there is an intensely hot central mass of the earth and large subterranean fires are near at hand. (2)	Uriah Smith	Short commentary	February 26, 1867	29/12, 136
Anonymous	**Notes on Genesis.** Turner: mosaic record silent on geological construction. Malte-Brun: "... *speculative* geology oversteps evidence of facts. Graves: Papal infallibility shaken. (2)	Uriah Smith	Selected reprints	March 12, 1867	29/14, 160-1
G. W. Amadon	**Scatter the Publications!** Brethren and sisters are encouraged to buy tracts to spread the light. Spread elder Bourdeau's article, "Geology and the Bible" to emphasise the six 24-hours days of Creation. (2)	Uriah Smith	Original	October 1, 1867	30/10, 12-13[?] not online
Jos. Clarke	**Adventism.** Elder Clarke relates to a recent *New York Tribune* article that throws condemnation on Adventism. Charles Lyell once attended a Millerite meeting but soon "fell back on his geology." (1)	Uriah Smith	Original	November 26, 1867	30/24, 376-7
Anonymous	**The Days of Creation.** Brief quotes used to show support for literal days of 24 hours. Edward Hitchcock in *Religion of Geology* six day's work "fitted up the world in its present condition." (1)	Uriah Smith	Selected reprints	January 21, 1868	31/06, 92
James Sawyer	**Incidents at the Sandwich Islands.** [Geology is proof of the internal fire of the earth. Are volcanic eruptions at the Sandwich Islands the judgement of God upon shameful and wicked men?] (1)	Uriah Smith	Original	June 23, 1868	32/01, 4-5
Anonymous	**The Resurrection Not Impossible.** From the *Spiritual Rostrum*, a magazine devoted to the 'Science of Man.' Geologists' great age of the Earth does not contradict man's presence more than 6000 yrs. (1)	J. N. Andrews	Introduced reprint	June 15, 1869	33/25, 196
D. T. Taylor	**The Coming Earthquake.** The Bible gives evidence of the convulsive nature of earthquakes. Geological perspective presented quite outdated. Last convulsions at the end of the world will soon come. (3)	J. N. Andrews	Introduced reprint	November 9, 1869	34/20, 153-5
D. T. Taylor	**The Great Earthquakes in New England in the Eighteenth Century.** Reprinted from the *Boston Journal*. Earthquakes in New England compared with the 1755 Lisbon quake. "But are we safe?" (1)	J. N. Andrews	Reprint	January 4, 1870	35/02, 10-1
D. T. Taylor	**The Coming Doom.** Reprinted from *The Coming Earthquake*. Reprint related to 2 peter 3: 10, the earth shall be burned up. Long ago biblical prophecy predicted the last mighty convulsion of the earth. (1)	J. N. Andrews	Reprint	January 25, 1870	35/05, 35
Rev. R. Patterson, D. D.	**Geological Chronology.** Extract from *Family Treasury* magazine. Charles Lyell's 'blunders' in calculating the age of deltas on the basis of sedimentation rates are ridiculed. (1)	J. N. Andrews	Introduced reprint	February 8, 1870	35/07, 51
Anonymous	**To Correspondents.** "We do not think sufficient reliance can be placed upon the deductions of Geology, to warrant the devotion of any particular amount of space or time to its defence." (1)	Uriah Smith	Questions answered	April 12, 1870	35/17, 136
Jos. P. Thompson D. D.	**Good Testimony.** Reprinted from *Man in Genesis and in Geology*. The book roots up the "blatant theory that the human race has come up from the zoophyte ..." His day-age interpretation is not appreciated. (2)	Uriah Smith	Introduced reprint	June 7, 1870	35/25, 196-7
Anonymous	**Geology Again at Fault.** From the *London Quarterly*. Skeptic geologists attempt to use geology to attack the Scriptures. They "show themselves to be nothing but air." Megalithic stone structures are modern (2)	Uriah Smith	Introduced reprint	June 14, 1870	35/26, 203
Anonymous	**The Coming Doom.** From D. T. Taylor's *The Coming Earthquake*. 2 Peter 3: 10 is quoted to support the testimonies cited. "The whole world may disbelieve it – this uttered thing of God will be." (2)	Uriah Smith	Reprint by request	September 20, 1870	36/14, 106-7
Joseph F. Tuttle	**That Old Skull.** Human skull alleged to have been found in a much lower and earlier geological formation. Modern skull alleged to have been found in Tertiary formation. Geology not to be trusted. (1)	Uriah Smith	Reprint	October 25, 1870	36/19, 146
Anonymous	**To Correspondents.** Answered by B. F. W. The facts of geology are the problem; the wild guess-work based on these facts we object to. (2)	Uriah Smith	Letter	January 17, 1871	37/05, 37
S. Pierce	**Does the Bible Agree with Science?** The science of geology has been nothing but assertions and is still I its infancy. The geologists 'think' that it has taken a much longer time to form portions of the earth. (3)	James White	Original (?)	October 3, 1871	38/16, 121-2
Joseph F. Turtle	**That Old Skull.** Reprint of same article of October 25, 1870. Introduction: "The following is a capital hit on that popular farce and prime minister of skepticism, geological guess-work." (1)	James White	Introduced reprint	January 28, 1875	45/05, 37
Francis Nelson	**The Bible the True Standard of Faith.** Testimony of Francis Nelson for choosing Adventism as her church. Comfortable with the church's relationship between geology and faith. (1)	James White	Original	May 20, 1875	45/21, 167
Sel. (?)	**Science and Scripture.** The author is making fun of the use of conjecture in geology. Suggested changes in the length of the Mississippi River are taken to the extreme to look ridiculous. (3)	James White	Introduced reprint	June 15, 1876	47/24, 189
D. A Robinson	**Why Not Discovered Before?** Why was it not earlier discovered that the Sabbath of the Bible is the seventh day? What about geology? Truth has always had battle with error ever since the fall of man. (2)	James White	Original	February 8, 1877	49/06, 41
Uriah Smith	**Scientific Folly.** "Make what concessions we will to the pretensions of geology, it cannot be claimed that any traces of human beings are found farther back than 6000 years ago." (1)	James White	Introduced reprint	July 12, 1877	50/03, 20
M. L. B.	**To correspondents.** To W. H. Kynett: Recommendation of *Geognosy* by D. N. Lord which harmonises geology with the Bible. A revised edition may soon appear. (1)	Uriah Smith	Letter	December 6, 1877	50/23, 180
W. Penniman	**J. P. Thompson, D. D., LL. D. on the Sabbath.** The reprinted section on the Sabbath comes from Thompson's *Man in Genesis and in Geology*. Penniman differs with Thompson on the nature of the Sabbath. (1)	Uriah Smith	Discussion reprint	January 24, 1878	51/04, 26
Elder G. I. Butler	**Education among Seventh-day Adventists.** Schools opposed to the Adventist views have subtle influences hard to resist. Many trained teachers there teach geology and science opposed to the Bible. (1)	Uriah Smith	Original	September 11, 1879	54/12, 89-90
Anonymous	**Science and Religion.** Reprint from *Townsend*. Unbelievers claim Bible ma mistakes concerning science of geology. Several geologists quoted to show harmony between geology and the Bible. (1)	Uriah Smith	Reprint	September 25, 1879	54/14, 106

D. N. Lord	**The Structure of the Earth.** Reprinted section of *Geognosy*. Geological theory of the age of the earth and criteria by which it is to be tested. Facts indisputable but hypotheses used questioned. **(4)**	Uriah Smith	Reprint	February 12, 1880	55/07, 98-9
J. O. Corliss	**Geologists vs. the Mosaic Record.** Preached on a Sabbath afternoon. Not a demonstrative science. Geology is a mere *description* of earth crust materials; their *suppositions* are quite something else. **(8)**	Uriah Smith	Original discourse	February 19, 1880	55/08,116-7
Anonymous	**Battle Creek College advert.** Department of Theology offers a three years course. Includes amongst others Geology and Greek. **(1)**	Uriah Smith	Original advert	June 3, 1880	55/23, 367
Anonymous	**The Signs of the Times.** A religious prophetic journal. Besides contributions from James and Ellen White, elder Smith (?) will give a series of articles under the heading, Synopsis of Present Truth. **(0)**	Uriah Smith	Endorse-ment	June 10, 1880	55/24, 383
G. I. Butler	**Our College at Battle Creek.** Debts should be removed and accommodations increased. Specimens for instruction in geology and mineralogy found piled up in basement room. **(1)**	Uriah Smith	Original	March 15, 1881	57/11, 169
G. I. Butler	**The Support of Education.** Buildings are necessary. A museum of specimens in natural history, geology and mineralogy to illustrate these important subjects is desirable. Funds needed. **(1)**	Uriah Smith	Original	March 22, 1881	57/12, 183
E. P. Daniels	**False Science.** Calculations in geogony proofs Mosaic record of the creation incorrect. Geology contradicts the idea of a general flood. "We were not there when it was done." Geology full of uncertainty. **(2)**	Uriah Smith	Original	June 7, 1881	57/23, 356
H. A. St. John	**Synopsis.-No.12: Infidel Geology.** Reprint from *Nelson on Infidelity*, pp. 18-21. The "Infallible science of Geology" questioned with narratives from travellers. **(2)**	James White	Reprint	August 9, 1881	58/07, 105
Anonymous	**Everett's Definition of a Good Education.** From the *Education Weekly*. Edward Everett: read and write the English language well and master arithmetic. "... all the mere flashy attainments, a little geology, and all other *ologies* and *osophies*, are ostentatious rubbish." **(2)**	Uriah Smith	Reprint	April 18, 1882	59/16, 246
C. C. L.	**Battle Creek College.** Happy termination of the long winter term of Battle Creek College. Spring term, formation of new classes in Botany, Geology, Zoology, Astronomy, Civil Government, and Logic announced. **(1)**	Uriah Smith	Original	April 18, 1882	59/16, 248
Anonymous	**False Theories of Geologists.** Answer to correspondent request. Lyell's uniformity principle questioned. D. N. Lord quoted to refute this. Humboldt's *Narrative* quoted to further doubt this. **(0)**	Uriah Smith	Discussion reprinted parts	September 5, 1882	59/36, 568-9
T. De Witt Talmage	**Evolution.** Anti-Bible, Anti-Science, Anti-Commonsense. Sermon originally called: The Guess of Evolution. "Away with your rotten, deceptive, infidel, and blasphemous evolution, and give us the Bible, -salvation through Jesus Christ our Lord. **(0)**	Uriah Smith	Reprint	April 24, 1883	60/17, 261-2
Albert Weeks	**Humility.** "Geology can tell us what it finds beneath the earth's surface, but when it undertakes to tell how it came there, we often have wild conjecture." Only God has the answers. **(1)**	Uriah Smith	Original	June 12, 1883	60/24, 372
A. T. Jones	**The Uncertainty of Geological Science.** The foundation of geology is an assumption; the superstructure must be the same. Geology is full of speculation. **(5)**	Uriah Smith	Original	August 7, 1883	60/32, 497-8
A. T. Jones	**The Uncertainty of Geological Science.** (Continued) Evidence of reasoning in a circle. Rocks dated by their fossils; fossils dated by their enclosing rocks. Is this what Paul cautions for in 1 Timothy 6: 20? **(1)**	Uriah Smith	Original	August 14, 1883	60/33, 513-4
A. T. Jones	**The Uncertainty of Geological Science.** (Concluded) 'There is nothing in the fossils themselves, ..., to fix their date." "*Geology is not susceptible of demonstration*." "And *therefore* it is the *fitting foundation* of *Evolution*." Darwin: geology indispensable for understanding man's origin. **(11)**	Uriah Smith	Original	August 21, 1883	60/34, 529-30
A. T. Jones	**Is Evolution Science?** Jones quotes University President Gregory: "Let us have real science, and not sham science." Too many 'working hypotheses" in evolution and geology. **(3)**	Uriah Smith	Discussion of text extracts	August 28, 1883	60/35, 547
Anonymous	**Thoughts for Free-Thinkers.** In Detroit *Evening News*, 'Conference for the furtherance of Free Thought.' All sciences were built up by non-Christians. But, Hugh Miller, expounder of geology was a Christian. **(1)**	Uriah Smith	Introduc-ed reprint	September 18, 1883	60/38, 600
Anonymous	**Giving Way.** "responsible leaders . . . in the religious world, are making concessions to the demands of so-called science . . ." Evolutionist, H. W. Beecher quoted as, "infidelity is only another form of Christian belief." **(1)**	Uriah Smith	Editorial	October 23, 1883	60/42, 664
W. H. Littlejohn	**Scripture Questions.** 203.-Geology and the Bible. "The simple fact is that that which is now called the Science of Geology is, at the present time, so crude that it cannot be quoted against the Bible record." **(3)**	Uriah Smith	Original	November 20, 1883	60/46, 730
N. L. Hastings	**The Inspiration of the Bible.** (Lecture before Y.M.C.A. convention - concluded) The Bible is the "transcript of the Divine Mind." Redemption, salvation, etc. cannot come from doing geology. **(2)**	Uriah Smith	Reprint	November 27, 1883	60/47, 746-8
A. T. Jones	**Sound Speech that cannot be Condemned.** Speech by Dr D. T. Spear as printed in N. Y. *Independent*. Modern infidelity claims modern science contradicts the Bible. Difference between geological facts and *inferences*. Jones quotes Spear, " . . . *let the geological inferences go to the dogs*." **(1)**	Uriah Smith	Discussed text extracts	January 8, 1884	61/02, 27-8
A. T. Jones	**"Evolution" and Evolution.** Most 'scientific teachers' "are avowed evolutionists." Does Darwinism (natural selection hypothesis) differ from evolution (generational succession) or are the two synonymous? **(1)**	Uriah Smith	Original	March 11, 1884	61/11, 162-3
A. T. Jones	**"Evolution" and Evolution.** (Concluded) Evolution and geology have too many 'assumptions.' Jones quotes from Darwin's *Descent of Man* to support this. Science should be based on the truth of God. **(1)**	Uriah Smith	Original	March 25, 1884	61/13, 194-5
D. P. Curtis	**Doctrine vs. Doctrines.** "theorists on geology and evolution . . . who advocate natural immortality of the soul, and a Sunday-Sabbath . . . are carried about with divers and strange doctrines . . ." **(1)**	Uriah Smith	Original	June 3, 1884	61/23,354-5

W. H. Littlejohn	**The Temple in Heaven.** Many Christians belief that there is a conflict between Scriptures and the teaching of geology. Because of its endorsements by their spiritual guides they have lost faith in Scripture. **(2)**	Uriah Smith	Original	March 3, 1885	62/09, 129-31
Dr. S. W. Murphy	**Geology and the Bible.** From the *Rugby Monthly*. Recent geological results favour the Biblical account of the age of man. The glacial epoch closed about 6000 years ago when Adam received the breath of life. **(2)**	Uriah Smith	Reprint	March 31, 1885	62/13, 198
Anonymous	**"Three Curious Discoveries."** More indications that man is not older than the records of Genesis. "A little knowledge will explode any amount of hypotheses. . ." From the *Ladies' Repository*. **(1)**	Uriah Smith	Introduced text extract	April 14, 1885	62/15, 230
Anonymous	**Earth! Earth! Earth!** From *World Crisis*. Prof. Hitchcock states that the earth contains within itself its agencies needed for its final dissolution by fire at the day of Judgement. **(1)**	Uriah Smith	Reprint	April 28, 1885	62/17, 262
Max Muller	**Geological Mysteries vs. Biblical revelation.** From the N. Y. Observer. "If weak by faith, why choose the harder side?" Skepticism of faith "is generated through a false geology." **(1)**	Uriah Smith	Reprint	June 9, 1885	62/23, 358
H. Wren	**Wonders of the Law.** The law contains all scientific truth, and excludes all false science. Scientific truth is only from facts. False science meets the same fate as false religion. **(1)**	Uriah Smith	Original	April 20, 1886	63/16, 242-3
A. D. Wellman	**"Of What Sort is it?"** An erratic skeptic on Creation was impervious to reason, to the youthfulness and immaturity of geology, to the explosion of many of its hyped theories, and the insufficiency of its data. **(1)**	Uriah Smith	Original	September 18, 1888	65/38, 596
J. N. A. (J. N. Andrews)	**Geological Epochs marked in the Bible.** The science of geology totally ignores the Mosaic narrative concerning the fall of man and curse of God, and destruction and elevation of the earth crust by the deluge **(1)**	Uriah Smith	Original	September 10, 1889	66/36, 567-8
L. A. S. (L. A. Smith	**Missing Links.** Where are the missing links in the great line of evolutionary development? "Why does not geology give some hint, in the fossil remains of the earth . . .?" **(1)**	Uriah Smith	Original	November 17, 1891	68/45, 713
M. E. Cornell	**Science vs. the Bible.** "Vain philosophy," geology, and human reasoning, in "science falsely so-called," dominates now. However, the "scientists are out of harmony with revelation, reason and analogy." **(3)**	Uriah Smith	Discussion of text extract	April 26, 1892	69/17, 258
M. E. K.	**The Days of Creation.** Scientific men who belief in long geological periods of the formation of the earth belief that an attempt to reconcile the Bible with the *deductions* of geology is impossible. **(1)**	Uriah Smith	Original	September 6, 1892	69/36, 570
E. G. White	**Be Separate.** "Science, so-called, human reasoning and poetry, cannot be passed on as of equal authority with revelation; ..." **(0)**	Uriah Smith	Original	November 20, 1894	71/46, 721-2
D. E. Lindsey	**Queries Answered.** "The history of geology affords abundant testimony of the unsettled, unreliable character" of its hypotheses. "Rather let us abide by the word of God, which liveth and abideth forever." **(6)**	Uriah Smith	Original	December 11, 1894	71/49, 770-1
E. G. White	**True Worth.** "Science, falsely so-called, is wearing away the foundation of Christian principle; ..." **(0)**	Smith/ Tenney	Original	December 29, 1896	73/52, 821-2
A Bowers D. D.	**Attention, All: Some reasons for believing the world to be in a great crisis, which will soon be apparent to all men.** We dissent from believing geology and biology. **(1)**	Uriah Smith	Original	August 24, 1897	74/34, 530-1
Dr. L. A. Reed	**The Bible our Text-book.** The geology that says that the world was created over long periods of time is a lie, and contrary to the testimony of the *works* as it is to the letter of the Word. **(2)**	A. T. Jones	Original	November 2, 1897	74/44, 690
Dr L. A. Reed	**The Numbers of the Stars.** Harmonisations between religion and sciences should not remove the clear manifest meaning of the Scriptures just to avoid any problems. **(2)**	A. T. Jones	Discussion of text extracts	February 8, 1898	75/06, 87-8
E. G. White	**True Christianity.** "We need to guard continually against the sophistry in regard to geology and other branches of science falsely so-called, which have not one semblance of truth" **(1)**	A. T. Jones	Original	March 1, 1898	75/09, 133-4
Uriah Smith	**An Important Question, Again.** The geological claim that the days of Genesis were immense periods of time precludes a seventh-day Sabbath. Believers in the Bible do not accept men's inferences on geology. **(3)**	A. T. Jones	Original	April 26, 1898	75/17, 269-70
Uriah Smith	**An Illustration.** Geology shows that some time back (but within the Mosaic record!) coal-beds were formed to be used in the present time for the manufacturing industries. **(1)**	A. T. Jones	Original	May 31, 1898	75/22, 349
Anonymous	**No Title.** Tendencies of modern preaching: The literal history of the Creation is a mistaken idea. "The Bible was not designed by the divine Spirit to teach geology. . ."] **(3)**	A. T. Jones	Discussion of text extract	November 22, 1898	75/47, 754
M. Bessie DeGgraw	**Battle Creek College Advances.** Professor Cady teaches all branches of science – physics, chemistry, geography, geology, botany, and biology – in their relation to physiology. **(1)**	A. T. Jones	Original	December 20, 1898	75/51, 819
L. A. Reed	**True Science.** Three college studies deal with processes, principles and laws of the natural world: physics, Chemistry, and dynamic geology. Only the naked facts are taught as there was no Creator. **(1)**	A. T. Jones	Original	December 27, 1898	75/52, 826
A. T. Jones	**Creation or Evolution, Which?** The new science of geology has done most toward the establishment of the doctrine of evolution. Evolution depends on geology's long periods. **(1)**	A. T. Jones	Original sermon	February 21, 1899	76/08, 115-6
A. T. Jones	**Creation or Evolution, Which?** (Continued) "It takes so long a time, such indefinite and indeterminate ages, for evolution to accomplish anything that it does away with creation." **(0)**	A. T. Jones	Original sermon	February 28, 1899	76/09, 132
A. T. Jones	**Creation or Evolution, Which?** (Concluded) There are only two ways. You are either a creationist or an evolutionist. "Evolution is Infidelity, it is death. Creation is Christianity, and is life . . ." **(0)**	A. T. Jones	Original sermon	March 7, 1899	76/10, 147-8
Prof. B. P. Bowne	**"What is faith Respecting the Scripture?"** From the *Independent*. ". . . here and there someone is still distressed over astronomy, and geology, and ... the keeping of Sunday instead of Saturday as a holy day. For most these questions do not even exist. **(1)**	A. T. Jones	Reprint	July 10, 1900	77/28, 443

A. Smith	**Readjustment of the Stars.** The nebular hypothesis leads to skepticism. "Next to popular geology, its doubtless one of the most hypothetical sciences known." **(1)**	Uriah Smith	Original	June 11, 1901	78/24, 372-3
Anonymous	**No Title.** Geologists are getting less certain about the eons of time. Prof G. F. Wright, "geological time is much shorter than it was one supposed to be." Soon geology will be in harmony with the Bible? **(1)**	Uriah Smith	Introduc-ed reprint	July 16, 1901	78/29, 460
G. E. Price	**Some Scrap Quotations.** A great reform on our views of science is now due; "we may soon see the Biblical story of a universal deluge demonstrated by scientific evidence beyond all reasonable cavil." **(1)**	Uriah Smith	Original	November 19, 1901	78/47, 746-7
L. A. Smith	**The Mission of Seventh-Day Adventists.** We must bridge the faithfulness between the world and God until the gospel work is done. The literary meaning of six days should be kept. **(1)**	Uriah Smith	Original	January 28, 1902	79/04, 56-7
J. O. Corliss	**Must the Bible Go?** If the story of the flood was treated as mere tradition, and not as true, why not teach geology, "in which unrestrained visionary guessing is carried to perfection?" **(1)**	Uriah Smith	Original	November 26, 1903	80/47, 10-1
L. A. Smith	**Creation Story Not a Myth.** Prof. Luther T. Townsend's *Adam and Eve*. Townsend provides evidence for the Adam and Eve narrative is not a fable and that the creation days were literal days. **(1)**	W. W. Prescott	Book discussion	September 15, 1904	81/37, 4
Anonymous	**Anti-Infidel or Infidel?** Are the Scriptures simply the writings of good men or do they show the divine authorship of the Bible? The Bible is not to be tested by men's ideas of science. A correct theory of geology will never claim discoveries that cannot be reconciled with the Scriptures. **(1)**	W. W. Prescott	Discussion text extracts	December 15, 1904	81/50, 5-6
Anonymous	**Our time and its Meaning.** The rejection of the first angel's message has led to setting aside of the authority of the Scriptures. Geology came with its message that the world was not made in six days. The church readily accepted that. **(1)**	W. W. Prescott	Original	January 12, 1905	82/02, 3-4
Anonymous	**Creator and Redeemer.** Is it significant that in this last generation geology has come with the message that the earth was not made in six literal days? **(1)**	W. W. Prescott	Original	January 26, 1905	82/04, 3-4
Anonymous	**Revelation and Speculation.** "With the observed *facts* of geology there can be no quarrel, but when deductions are drawn from these facts which go against the reliability of the inspired account of creation, it is time to protest." **(2)**	W. W. Prescott	Original	February 9, 1905	82/06, 5-6
Anonymous	**No Title.** Endorsement of Geo. McCready Price's new book *Illogical Geology*. **(3)**	W. W. Prescott	Original	August 9, 1906	83/32, 24
Anonymous	**No Title.** Endorsement of Geo. McCready Price's new book *Illogical Geology*. **(4)**	W. W. Prescott	Original	August 16, 1906	83/33, 24
Anonymous	**No Title.** Endorsement of Geo. McCready Price's new book *Illogical Geology*. **(3)**	W. W. Prescott	Original	September 13, 1906	83/37, 2
Anonymous	**No Title.** Endorsement of Geo. McCready Price's new book *Illogical Geology*. **(1)**	W. W. Prescott	Original	October 25, 1906	83/ 43, 22
A. L. Miller	**The Cause of the Destruction.** Text-books of the public schools are mixed with truth and error (esp. in geology). God has instructed his people to establish schools where text-books are free from error. **(1)**	W. W. Prescott	Original	October 3, 1907	84/ 40, 25
Anonymous	**What is Papal Infallibility?** The inerrability of the popes does not extend to the natural sciences, such as astronomy and geology, unless where error is presented under the false name of science. **(1)**	W. W. Prescott	Discussion text extracts	February 20, 1908	85/08, 6
W. W. Prescott	**Creation vs. Evolution.** Many infidels have tried to reconcile geology with Genesis but it was impossible to reconcile Darwinism with Genesis Chapter three. Where there is a Seventh-day Adventist there is a living protest against infidel unbelief. **(2)**	W. W. Prescott	Sermon	July 1, 1909	86/26, 5-7
Anonymous	**The Bible Antiquated.** The Bible teaching concerning the creation is antiquated to those who accept the impossible theses of evolution and the deductions of geology. **(1)**	W. A. Spicer	Discussion text extract	September 2, 1909	86/35, 7
C. M. S.	**Overturning the world.** Many religious teachers have accepted evolution because "the truths of geology have supplanted" the record of Genesis. The deductions of geologists are uncertain in regard to the history of the earth. **(1)**	W. A. Spicer	Original	May 19, 1910	87/20, 12

[1] 'Anonymous' is used where articles are not undersigned. Chief editor's name of issue is provided.
[2] Occurrences in indexes or advertised in title of advertised sheets or tracts on the final pages have been omitted. Article titles are copied as much as possible as they appeared in the journal. Titles of source books, journals or tracts are given in *italics*. *Italics* as found in original text fragments are kept in quotations.
Some articles without any use of a 'geology' term are included in this table because of their relevance for the research arguments.

Appendix B

The occurrence of the 'geology' term used in *The Signs of the Times* between 1874 and 1910. Based on Seventh-Day Adventist Church General Conference – Office of Archives, Statistics, and Research - Online Document Archives, 2012.

Author[1]	Article title [Most relevant issue for this research] (frequency of 'geology' term used)[2]	Chief editor	Article type	Date journal published	Vol./no., page no.
E. G. White	**The Great Controversy.** Chapter Eight: Disguised Infidelity. Seven long periods during Creation strikes "directly at the foundation of the Sabbath." "It is the worst kind of infidelity." "Without Bible history, geology can prove nothing." **(2)**	J. H. Waggoner	Reprint	March 20, 1879	05/12, 90
D. N. Lord	**The Geological Theory of the Age of the Earth Examined.** Reprint from Lord's 1855 *Geognosy*. The great age of the world is based on assumptions, inferences and hypotheses; geologists cannot prove the great age of the earth. **(0)**	J. H. Waggoner	Reprint	May 1, 1879	05/18, 139
D. N. Lord	**The Geological Theory Contradictory to the Sacred History.** *Geognosy* section reprint. The geological theory goes against the law of the Sabbath. 'The whole Bible ... stands or falls with the first chapter of Genesis. **(4)**	J. H. Waggoner	Reprint	May 8, 1879	05/19, 146-7
D. N. Lord	**False Notions of Geology.** *Geognosy* section reprint. Geology is not a demonstrative science. Its facts are not in question; the problem is with its hypothesis, deductions, and assumptions. **(10)**	J. H. Waggoner	Reprint	May 22, 1879	05/21, 163
Elder R. F. Cottrell	**The Antiquity of Man.** "The earth did not create itself; and it cannot tell us how old it is." The assertions of geologists are merely guess work. Geological guess work is a "popular farce and the prime minister of skepticism." **(1)**	White/ Andrews/ Smith	Original	February 12, 1880	06/06, 69
Anonymous	**The New Earth.** Some selected quotes geologists and pastors describe the conflagration of the present world, and the new heaven and new earth to come. **(1)**	White/ Andrews/ Smith	Reprinted text sections	March 25, 1880	06/12, 136-7
Anonymous	**Length of the Mississippi.** Reprinted *Christian at Work*. Mark Twain mourns the shortening of the River after a river bend cut-off. Geology is mocked with unrealistic conjecture from this fact. **(1)**	J. H. Waggoner	Reprint	December 30, 1880	06/48, 575
E. J. Waggoner	**Religious Infidelity against the Sabbath.** Geology's long periods make it difficult to determine the Sabbath. Geologists contradict each other. Infidels propound such so-called scientific theories. **(2)**	J. H. Waggoner	Original	August 25, 1881	07/32, 379-80
Anonymous	**High-sounding Nonsense.** Analysis of Denton, a pseudo-professor around san Francisco. 'Geology can tell the fate and duration of the world.' The editor compares this with 2 Peter 2, 18-19. **(2)**	J. H. Waggoner	Original	October 27, 1881	07/40, 474
E. G. White	**Science and Revelation.** Professedly scientific men merely based on human stand-points will come to wrong conclusions. ".. a correct theory of geology will never claim discoveries that cannot be reconciled with his (Moses) statements." **(1)**	J. H. Waggoner	Original	March 13, 1884	10/11, 161-2
Rev. J. E. Rankin	**The New Theology.** (so-called) Reprinted from *Christian Union*. Geology is involved in the making of new heathens. ".. whole continents know not God, and they are like the great ages of geology – we cannot understand them." **(2)**	J. H. Waggoner	Reprint	March 27, 1884	10/13, 195
Anonymous	**The "Facts" of Some Scientists.** Reprint from the *Sunday School Times*. Scientists commonly build up a personal theory on their own limited knowledge of facts. Such science- 'falsely so-called' is a succession of blunders and changing theories. **(1)**	J. H. Waggoner	Reprint	October 2, 1884	10/37, 579
A. T. Jones	**The Uncertainty of Geological Science.** Reprinted from the *Review and Herald*, August 7, 1883. The foundation of geology is an assumption; the superstructure must be the same. Geology is full of speculation. **(6)**	J. H. Waggoner	Reprint	May 14, 1885	11/19, 292
A. T. Jones	**Uncertainty of Geological Science.** (Continued) Partial reprint form the *Review and Herald*, August 14, 1883. The law of superposition may be deceptive (GMP's later main argument!). Geologists are guilty of reasoning in a circle when determining the age of rocks and fossils. **(2)**	J. H. Waggoner	Reprint	May 21, 1885	11/20, 308
A. T. Jones	**Uncertainty of Geological Science.** (Continued) Reprint of sections of Review and Herald of August 14 and August 21, 1883 with slight modifications and additions. **(3)**	J. H. Waggoner	Reprint	May 28, 1885	11/21, 324
A. T. Jones	**Uncertainty of Geological Science.** (Concluded) Reprinted section of review and Herald of August 21, 1883 plus additions. "*Geology is not susceptible of demonstration."* Hebrews 11: 3, 1 quoted with this. **(9)**	J. H. Waggoner	Reprint	June 4, 1885	11/22, 340
A. T. Jones	**"Evolution" and Evolution.** Reprint of same article in the Review and Herald of March 11, 1884. Most 'scientific teachers' "are avowed evolutionists." Does Darwinism (natural selection hypothesis) differ from evolution (generational succession) or are the two synonymous? **(1)**	J. H. Waggoner	Reprint	June 11, 1885	11/23, 356-7
A. T. Jones	**"Evolution" and Evolution.** The term 'geology' does not appear. Largely a reprint of the article in the Review and Herald of March 18, 1884. Jones discussed theistic evolution.	J. H. Waggoner	Reprint	June 18, 1885	11/24, 372
A. T. Jones	**"Evolution" and Evolution.** (Continued) reprinted with additions from the Review and Herald of March 25, 1884. Evolution and geology have too many 'assumptions.' Jones quotes from Darwin's *Descent of Man* to support this. Science should be based on the truth of God. **(1)**	J. H. Waggoner	Reprint	June 25, 1885	11/25, 388-9

A. T. Jones	**"Evolution" and Evolution.** (Concluded) Reprinted with some additions from the Review and Herald of March 25, 1884. **(7)**. Jones emphasised that evolution is dependent upon geology.	J. H. Waggoner	Reprint	July 2, 1885	11/26, 404
W. N. Glenn	**The Raid on Genesis.** So-called scientists, especially of geology, have long indicated the world to be very old and so reducing Genesis to fiction. The next move is to try to remove Genesis. **(1)**	J. H. Waggoner	Original	September 3, 1885	11/34, 531
E. G White	**Notes on the International Lesson –The Beginning.** Selected excerpts from E. G. White. Reference to 'Infidel geologists.' "Without Bible history, geology can prove nothing." **(2)**	J. H. Waggoner	Reprinted sections	December 16, 1886	12/48, 762-3
Anonymous	**Scientific Accuracy of the Bible.** Reprinted from the *London Record*. A discussion of Dr Samuel Kinns' book *Moses and Geology*. It credits the miraculous accuracy in the Mosaic cosmogony. **(2)**	E. J. Waggoner/ A. T. Jones	Reprint	April 22, 1889	15/16, 245
Anonymous	**The First Adam.** International S. S. Lessons – Lesson I. Science contrary to the word is "science falsely so-called. "... the changes which geology notes might have taken place previous to the six days of creative energy" or "at the time of the deluge." **(1)**	M. C. Wilcox	Original	December 25, 1893	20/08, 125
W. W. Prescott	**Christian Education.** (Continued) Talk of Prof. Prescott (Battle Creek College) at the Oakland camp meeting. The hand of the Lord has wrought such sciences as geology and mineralogy. **(2)**	M. C. Wilcox	Original	June 25, 1894	20/33, 516-7
G. F. Pentecost	**The Fullness of the Bible.** "The Bible is the *summum bonum* of all literature." The Bible has all science. "Do you want to study geology? Behold he is the Rock of ages." **(1)**	M. C. Wilcox	Reprint ?	October 21, 1897	23/41, 648
Anonymous	**No. 652. Discoveries of Geology.** Question Corner "All the *true* discoveries of geology do not really conflict with the word of God." They make wrong "calculations" on what they do discover. **(4)**	M. C. Wilcox	Answered question	October 28, 1897	23/42, 664
Anonymous	**Knowledge, False and True.** "Science falsely so-called" is "guesswork or hypothetical sort of knowledge." It is "the basis of nearly all sciences and arts" (natural philosophy, astronomy, geology, etc.). **(1)**	M. C. Wilcox	Editorial article	February 22, 1899	25/08, 134
H. F. Ketring	**"The Number of his Name."** When the pope speaks *Ex Cathedra* Catholics believe his infallibility. On 'astronomy' or 'geology' or 'purely political questions' no infallibility attaches to him. **(1)**	M. C. Wilcox	Original ?	June 7, 1899	25/23, 371-2
Anonymous	**Guesses.** Reprint from *World's Harvest*. Many conclusions of men begin with "mere plausible guesses" (hypotheses) of absolutely no worth. "So in geology and other sciences." **(1)**	M. C. Wilcox	Reprint	October, 18, 1899	25/42, 688
Wm. Penniman	**The Punishment of the Wicked. "The Great Tendency to Extreme Literalism."** The Bible teaches literal hell fire. The Bible and geology teach that the world was once destroyed by water. **(1)**	M. C. Wilcox	Original	November 1, 1899	25/44, 711
Anonymous	**The Day of the Sabbath. An examination of Mr. Crafts' Reply.** Mr Crafts is cited that the burden of proof against a Sunday is on the Saturday-keepers; geology teaches the six days are indefinite periods. **(1)**	M. C. Wilcox	Editorial	April 18, 1900	26/16, 246-7
Geo. E. Price	**"Darwinism at its last Gasp."** Family quarrel amongst evolutionists. Darwin would have been nowhere without Lyell's gradualism. "... to quote geology in favour of evolution is only reasoning in a circle." **(4)**	M. C. Wilcox	Original	January 15, 1902	28/03, 36-7
Geo. E. McCready Price	**Picture older than the Flood. Witnesses of God.** Geologists' cardinal doctrine of 'science,' their "pretentious system," has been questioned since 1859 with evidence in Western Europe that man lived alongside fossil, long-extinct species of mammals. **(3)**	M. C. Wilcox	Original	August 6, 1902	28/32, 498
Geo. E. McCready Price	**Pictures older than the Flood.** (Concluded.) Discoveries in the South of France. The "antiquated methods and doctrines of geology" seem "about to fall to pieces from very absurdity." **(3)**	M. C. Wilcox	Original	August 13, 1902	28/33, 516-7
Anonymous	**Have you read it?** Endorsement of Geo. E. McCready Price's *Outlines of Modern Christianity and Modern Science*. Science falsely so-called (geology) attempts to set aside the Word of God. "Get it and read it." **(2)**	M. C. Wilcox	Editorial note	January 20, 1904	30/03, 48
Anonymous	**Exalt the Lord our God.** "Geology and evolution, based on scientific hypotheses and guesses, have set aside in the minds of thousands the record of God's creation in Genesis ...Turn to God; ..." **(1)**	M. C. Wilcox	Editorial	April 6, 1904	30/14, 214
Anonymous	**Evolution and Geology.** Unbiblical, false theories of geology and evolution have undermined Biblical Christianity. Endorsement of Mr George E. Price articles which present the truth on those topics. **(2)**	M. C. Wilcox	Editorial note	April 6, 1904	30/14, 224
Anonymous	Advertisements of the coming articles on evolution and geology. They will discuss their relation to Christianity and the Bible in a clearer light than before. **(2)**	M. C. Wilcox	Editorial notes	November 23, 1904	30/46, ii, 736
Geo. McCready Price	**I. Plain Facts about Evolution and Geology.** A discussion of theistic evolution and an outline of the evolution theory	M. C. Wilcox	Edited reprint	November 30, 1904	30/47, 741
Anonymous	**Our next Number.** "There will be the second of the series of articles on "Evolution and Geology," entitled, "A Sure Guide to Truth," by Professor Price.] **(2)**	M. C. Wilcox	Editorial notes	December 7, 1904	30/48, end pages, not numbered
Geo. McCready Price	**[II.] A Sure Guide to Truth.** Discussion of ancient theories of cosmogony and the unerring guide of Scripture	M. C. Wilcox	Edited reprint	December 14, 1904	30/49, 772
Geo. McCready Price	**III. Evolution and Morals.** What are the fruits of the evolution theory? The usefulness of the Bible to explain man's creation	M. C. Wilcox	Edited reprint	December 21, 1904	30/50, 787
Geo. McCready Price	**IV. Evolution and Morals.** Further discussion of the negative 'fruits' of the evolution theory.	M. C. Wilcox	Edited reprint	December 28, 1904	30/51, 806
Geo. McCready Price	**V. Evolution and the World Problems.** Price discusses the increase of knowledge, ineffectiveness of education, growing discontent, and increase of crime and lawlessness as symptoms.	M. C. Wilcox	Edited reprint	January 4, 1905	31/01, 7-8
Geo. McCready Price	**VI. Evolution and the World Problems.** Price continues his discussion of world problems by outlining despotic governments, suppression of human rights, and the threat of (Catholic) state religion.	M. C. Wilcox	Edited reprint	January 11, 1905	31/02, 22-3

Anonymous	**Next Week's Paper.** Announcement of the next article in the series on evolution and Geology. **(1)**	M. C. Wilcox	Editorial note	January 11, 1905	31/02, 32
Geo. McCready Price	**VII. The Evidence of Archaeology. Part I.** "... there are certainly some leading facts about man's early history that are a thousand times more certain than most of the supposed generalizations of Darwinism or Geology." **(1)**	M. C. Wilcox	Edited reprint	January 18, 1905	31/03, 40-1
Geo. McCready Price	**VIII. The Evidence of Archaeology. Part II.** Price doubts that domestic animals were acquired by men before the Deluge (suggested by geology to have been "a kind of perpetual summer." **(3)**	M. C. Wilcox	Edited reprint	January 25, 1905	31/04, 56-7
Geo. McCready Price	**IX. Darwinism.** Price quotes Prof. Fleischman, "The Darwinism theory of descent has not a single fact to confirm it in the realm of nature. It is not the result of scientific research, but *purely the product of the imagination."* (*Italics* possibly from Price). **(1)**	M. C. Wilcox	Edited reprint	February 1, 1905	31/05, 72-3
Geo. McCready Price	**X. Geology the Mother of Darwinism.** Assumptions of Darwinism. "Geology is one of the youngest of the sciences, and, . . . is about the last to be regenerated by common sense . . . without the baseless assumptions of Geology" there could be no theory of evolution.] **(13)**	M. C. Wilcox	Edited reprint	February 8, 1905	31/06, 88
Geo. McCready Price	**XI. Some Geological Definitions.** Stratigraphy is "based on a series of pure, unfounded assumptions, its results should have no weight whatever for us who want *facts*, not *theories*." **(7)**	M. C. Wilcox	Edited reprint	February 15, 1905	31/07, 104-5
Geo. McCready Price	**XII. The Assumptions of Uniformity.** A belated science. The belated science of Geology is not an inductive science; it still remains imprisoned in '*á priori*' theories. This so-called science of geology "needs to face square about." **(7)**	M. C. Wilcox	Edited reprint	February 22, 1905	31/08, 120-1
Geo. McCready Price	**XIII. The Successive Ages.** Geology "can tell us about as much concerning the real conditions of the earth's interior as a fly can discover of the pulp of an orange by walking over an inch or two of its surface, and sucking at its rind here and there." **(4)**	M. C. Wilcox	Edited reprint	March 1, 1905	31/09, 136-7
Geo. McCready Price	**XIV. The Successive Ages.** (Continued) "..., I see no escape from the acknowledgement that the doctrine of any particular fossils being essentially older than others is a *pure invention, with absolutely nothing to support it in nature*." **(4)**	M. C. Wilcox	Edited reprint	March 8, 1905	31/10, 152-3
Geo. McCready Price	**XV. The Successive Ages.** (Concluded) Price declines to believe the "incredible fairy tales" of thrust faults, invented by geologists, to explain reverse orders of fossils. Geologists should use common sense. **(1)**	M. C. Wilcox	Edited reprint	March 15, 1905	31/11, 168-9
Geo. McCready Price	**XVI. Extinct Species.** By removing its foundation in geology the folly of the creation doctrine can be shown. Our study of geology will provide proofs of the reality of the Deluge and the literal Creation. **(11)**	M. C. Wilcox	Edited reprint	March 22, 1905	31/12, 184-5
Geo. McCready Price	**XVII. Extinct Species.** Price raises the possibility that 'extinct' species are not really distinct from living representatives today. The Bible Deluge can only provide the answer.	M. C. Wilcox	Edited reprint	March 29, 1905	31/13, 200-1
Geo. McCready Price	**XVIII. Extinct Species.** (Continued) The traditional arrangement of fossils was "invented" when little or nothing was known of the rocks outside England and Germany. The science of geology needs reconstructed to get an inductive basis. **(5)**	M. C. Wilcox	Edited reprint	April 5, 1905	31/14, 216-7
Geo. McCready Price	**XIX. Extinct Species.** (Concluded) "Geology is founded on hypotheses and not on facts." Geology is not an inductive but a deductive science "*based on highly questionable postulates and axioms ...*" "But there is no science in all this.". *The Biblical Deluge alone can explain it.* **(11)**	M. C. Wilcox	Edited reprint	April 12, 1905	31/15, 232
L. D. Avery-Stuttle	**Education in the Home. No. I**. The need for Bible studies at home is discussed. The children report that the teacher is teaching in geology lessons that the world was not made in six days. **(2)**	M. C. Wilcox	Original story	May 17, 1905	31/20, 318
G. [W. N. Glenn?] Ass. ed.	**Reply to some Anti-Sabbath Arguments.** G. reacts to a magazine article that supports creation 'periods.' Geological reference is not evidence . . . "nothing is more contradictory than the deductions of geologists." **(2)**	M. C. Wilcox	Editorial	June 28, 1905	31/26, 405
Mr. Frank Wright	**The Creation of Plants.** Geology leads to infidelity. Bible chronology extends 6000 years. Geology claims the earth has supported life for probably billions of years. **(1)**	M. C. Wilcox	Reprinted paper	August 23, 1905	31/34, 537-8
R. E. Crawford	**Distribution of Plants at Creation.** Science (geology) gives no accurate data for the exact time when Carboniferous climatic conditions existed. **(1)**	M. C. Wilcox	Original	September 6, 1905	31/36, 570
Geo. McCready Price	**Historical Sketch. Buffon and Werner.** The seven 'epochs' of Buffon are "dreams of a whirling brain...., **the rocks do not occur** in the order which Werner imagined." Price maintains that fossils do not occur in a standard order. **(7)**	M. C. Wilcox	Edited reprint	October 18, 1905	31/42, 664-5
Geo. McCready Price	**Historical Sketch** (Continued.) **Smith, Cuvier, and Hutton.** Price reflects on "the horrible logic in taking this (i. e. Buffon's) "immense complex" of guesses and assumptions *as the starting point for new departures,* the *solid foundation* for renewed 'investigations'. . ." **(3)**	M. C. Wilcox	Edited reprint	November 1, 1905	31/44, 696
Geo. McCready Price	**Historical Sketch. Life-Succession.** 18th century scientists followed true empirical or scientific methods in studying rocks. The 19th century "monstrous assumption" that "they must occur in this order *all over the globe* has ever been the stumbling block of geological science." **(4)**	M. C. Wilcox	Edited reprint	November 15, 1905	31/46, 728
Geo. McCready Price	**Historical Sketch** (Concluded.) **James Hutton.** Price doubts whether Hutton followed a "strict inductive method." Common-sense methods in geology or true induction is capable of finding out whether the present regular action of the elements has always prevailed; ..." **(4)**	M. C. Wilcox	Edited reprint	November 29, 1905	31/48, 760
Anonymous	**Scientific Speculation** Reprinted from *London Present Truth*. Geologists can arrive at exactly opposite conclusions. Geology is not at all an exact	M. C. Wilcox	Reprint	January 17, 1906	32/03, 39

	science and this brings their interpretations of the past history of the earth. **(1)**				
S. [C. M. Snow?] Ass. ed.	**Marvelous Credulity.** "Science" has been busy in "overthrowing the Bible." Few deductions are more uncertain than the deductions of geologists in regard to the history of the earth. **(1)**	M. C. Wilcox	Editorial	February 14, 1906	32/07, 101-2
Anonymous	**"Illogical Geology; the Weakest Point in the Evolution Theory."** Endorsement. The author has found "the phenomenal weakness of the geological argument." Ministers of the Gospel and students should read it. **(1)**	M. C. Wilcox	Endorse-ment	October 31, 1906	32/42, 641
Anonymous	**"Illogical Geology."** "Whether our readers believe in the hypotheses, the deductions, or the conclusions of geologists or not, they ought to read this book ..." **(7)**	M. C. Wilcox	Endorse-ment	October 31, 1906	32/42, 644
Anonymous	**"Illogical Geology."** Price: arguments for a sudden catastrophe have never been properly answered by 'orthodox' geology. The assumption that similar fossiliferous strata are of the same age in all parts of the earth is unproven. **(4)**	M. C. Wilcox	Endorse-ment	January 2, 1907	33/01, 16
Geo. W. Reaser	**The Great Salvation.** Divine Revelation. The science of mathematics or geology cannot provide redemption and salvation from intemperance and sin. **(1)**	M. C. Wilcox	Original	February 6, 1907	33/06, 86-7
Anonymous	**"Scientific Confirmations of Old Testament History."** By G. Frederick Wright. The author supports an old age for the world but makes a strong argument for a universal flood. Readable, refreshing, helpful. **(2)**	M. C. Wilcox	Literary notice	June 19, 1907	33/25, 399
G. D. Ballou	**The Bible Scientific** "The record of Moses needs no defense, explanation, or apology, but modern geology is all the while revamping and remodelling itself." **(2)**	M. C. Wilcox	Original	May 20, 1908	34/21, 325
Earl Albert Rowell	**Higher Criticism VIII. Some Fruits of Higher Criticism** Higher Critics: "We are obliged to admit that there are scientific errors in the Bible, errors of astronomy, of geology, of zoology, of botany, and of anthropology." **(1)**	M. C. Wilcox	Original?	June 28, 1910	37/25, 389, 393
Earl Albert Rowell	**Higher Criticism XVI. The Bible as the Word of God** Difficulties between the records of Genesis concerning the formation of the earth "have been created by the Evolutionists' gigantic assumptions of the most absurd and utterly unwarranted and absolutely unproved theories. ... the discoveries of science, not the theories, are corroborating the Bible statements ..." **(1)**	M. C. Wilcox	Original?	September 6, 1910	37/35, 551-2