

# TABLE OF CONTENTS

INTRODUCTION.....	11
The Need for Re-examination of These Men .....	12
How This Book Is Organized .....	16
THE HISTORICAL CONTEXT .....	19
Intellectual and Religious Background.....	19
The Galileo Affair.....	19
Baconian Science.....	21
The Enlightenment .....	24
Historical Developments in Geology, Palaeontology, and Cosmology.....	25
Neptunist-Vulcanist Debate .....	27
Reinterpretations of Genesis.....	33
The Early 19th Century Social and Religious Milieu .....	36
A Time of Revolution.....	36
The Make-up of the British Church .....	36
The Cambridge Network.....	37
The Oxford Movement.....	38
The <i>Bridgewater Treatises</i> .....	38
The BAAS and Other Scientific Organizations .....	39
Biblical Interpretation .....	40
Augustine, Luther, Calvin, and Wesley .....	40
Commentaries in the Early 19th Century.....	43
Assessing Geological Competence .....	45
SEVEN INDIVIDUAL PORTRAITS.....	55
Granville Penn (1761–1844).....	57
Geological Competence.....	58
Geology and Geologists.....	61
The Relationship Between Scripture and Geology .....	62
The Philosophical Foundation of <i>Comparative Estimate</i> .....	65
Creation According to Scripture.....	70
The Flood and Geological Changes Since the Creation.....	71
Conclusion.....	75

George Bugg (1769–1851).....	77
The Relationship Between Scripture and Geology .....	79
Geological Competence.....	82
Geologists and Geology.....	82
Creation and the Age of the Earth .....	84
The Flood.....	88
On Human Fossils .....	90
His Argument against Cuvier .....	90
Conclusion.....	96
 Andrew Ure (1778–1857) .....	 99
Geological Competence.....	102
Geology and Geologists.....	102
The Relationship Between Scripture and Geology .....	104
His Book on Geology.....	106
Creation and Pre-Flood History .....	106
The Flood.....	108
Reviews of His <i>Geology</i> .....	110
Conclusion.....	112
 George Fairholme (1789–1846) .....	 115
Scientific Work and Geological Competence.....	116
The Relationship Between Scripture and Geology .....	122
On the Laws of Nature.....	123
Summary of His Two Books.....	128
Conclusion.....	130
 John Murray (1786?–1851).....	 131
Geological Competence.....	135
General View of Geology .....	139
On the Laws of Nature.....	140
On Scripture .....	144
Creation and the Age of the Earth.....	147
The Flood.....	151
On the Fall of Man .....	154
Conclusion.....	155

## THE HISTORICAL CONTEXT



Before considering some of the individual scriptural geologists, we need to consider the intellectual and religious background and the history of geology leading up to the early 19th century, the cultural milieu at that time, what the Bible commentaries on Genesis were saying, and the marks of geological competence in the early 1800s.

### INTELLECTUAL AND RELIGIOUS BACKGROUND

The controversies in early 19th century Britain regarding the relationship of the early chapters of Genesis to the geological discoveries and theories did not, of course, take place in a vacuum. They were part of a complex movement of thought with philosophical, theological, social, political, and ecclesiastical dimensions, which pulsed through the educated minds of Europeans in general and of Britons in particular. The following highlights some of the most important people, events, and currents of thought leading up to and contributing to a revolution in world view which profoundly affected the 19th century Genesis-geology debate.

### THE GALILEO AFFAIR

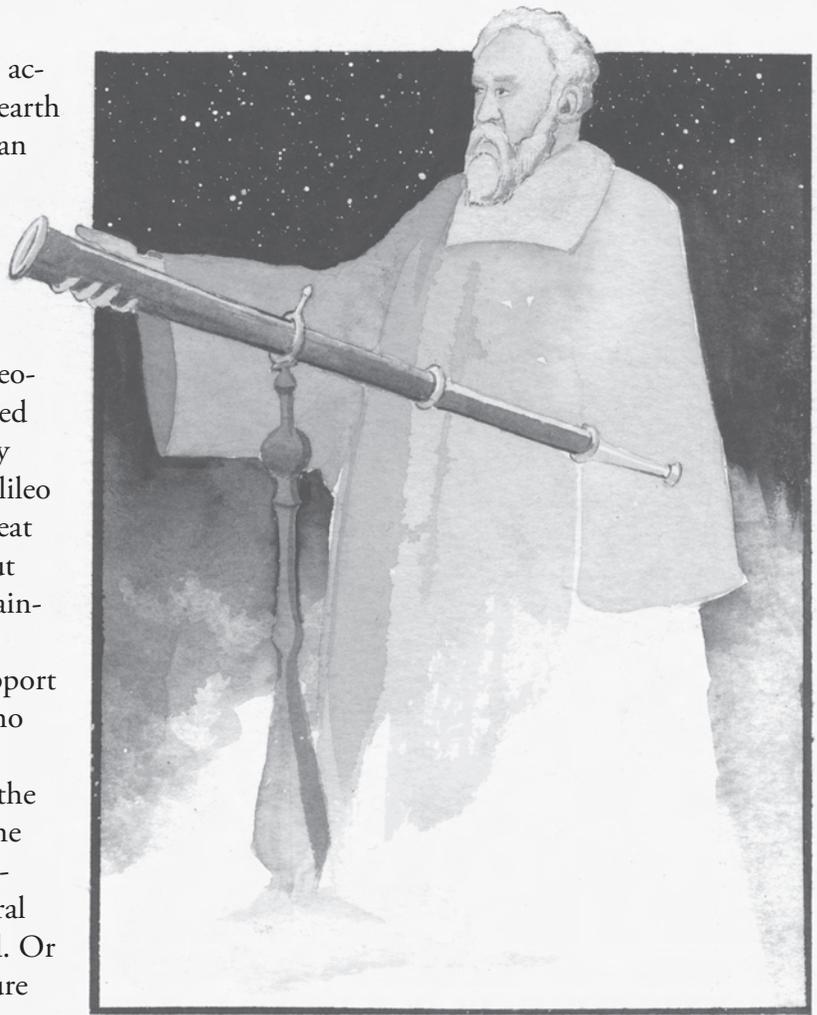
Shortly before his death in 1543 and with some hesitation, Nicholas Copernicus (1473–1543), the Polish mathematician and astronomer, published *On the Revolutions of the Heavenly Spheres*, in which he argued that the earth was not the center of the universe, as generally believed, but rotated on its axis and revolved with the other known planets around the stationary sun. Over the subsequent decades, opposition to his theory (as a description of physical reality, rather than merely as an alternative mathematical description) arose because it seemed contrary to common sense, was opposed to Aristotelian physics, lacked convincing astronomical evidence, and was contrary to a literal interpretation of various Scriptures. Approximately 150 years passed before his theory was generally accepted. But it was soon embraced by Johannes Kepler (1571–1630) and Galileo Galilei (1564–1642), though the latter was at first reluctant to publicize his views.

In 1613, Galileo finally came out in the open in his *Letters on Sunspots*. He argued that his observations of the heavens by means of the recently

invented telescope were consistent with what Copernicus had proposed was the actual relationship and movement of the earth and heavenly bodies. Initially, the Roman Catholic authorities accepted Galileo's assertions as compatible with the teachings of the Church. Eventually, however, Jesuit university professors (who were ultra-orthodox defenders of Catholic dogma and embraced the geocentric theory) were sufficiently provoked by Galileo's further writings so that they pressured the pope in 1633 to force Galileo to recant the heliocentric theory on threat of excommunication. He did recant, but was still under house arrest for the remainder of his life.<sup>1</sup>

This incident gave considerable support to others at the same time and later, who insisted (following Galileo) on a complete bifurcation between the study of the creation and the study of Scripture.<sup>2</sup> The Bible was written to teach people theology and morality, not a system of natural philosophy (i.e., science), it was argued. Or as Galileo said, the intention of Scripture is "to teach us how one goes to heaven, not how heaven goes."<sup>3</sup> Therefore, Galileo concluded that:

Nothing physical which sense experience sets before our eyes, or which necessary demonstrations prove to us, ought to be called in question (much less con-



GALILEO GALILEI (1564–1642)

demned) upon the testimony of biblical passages which may have some different meaning beneath their words. . . . On the contrary, having arrived at any certainties in physics, we ought to utilize these as the

1 Much has been written about this complex Galileo affair. See Thomas Schirmacher, "The Galileo Affair: History or Heroic Hagiography?" *Creation Ex Nihilo Technical Journal*, 14(1), 2000, p. 91–100 (at [http://www.answersingenesis.org/Home/Area/Magazines/tj/docs/TJ14\\_1-Galileo.pdf](http://www.answersingenesis.org/Home/Area/Magazines/tj/docs/TJ14_1-Galileo.pdf)); Charles E. Hummel, *The Galileo Connection: Resolving Conflicts Between Science & the Bible* (Downers Grove, IL: InterVarsity Press, 1986); Colin A. Russell, *Cross-currents: Interactions Between Science and Faith* (Grand Rapids, MI: W.B. Eerdmans Pub. Co., 1985), p. 37–54; Colin A. Russell, R. Hooykaas, and David C. Goodman, *The "Conflict Thesis" and Cosmology* (Milton Keynes: Open University Press, 1974); William R. Shea, "Galileo and the Church," in *God and Nature*, David C. Lindberg and Ronald L. Numbers, editors (Berkeley, CA: University of California Press, 1986), p. 114–135; John Dillenberger, *Protestant Thought and Natural Science* (Garden City, NY: Doubleday, 1960), p. 22–28; Thomas S. Kuhn, *The Copernican Revolution* (1971), p. 219–228.

2 There had been others before, too, such as the moderate Lutheran, Rheticus, who studied mathematics and astronomy under Copernicus and helped get his book published. Rheticus had virtually the same view of the interpretation of Scripture in relation to the study of nature that Galileo had and he wrote about it in a pamphlet in 1539. See R. Hooykaas, *G.J. Rheticus' Treatise on Holy Scripture and the Motion of the Earth* (1984).

3 Galileo Galilei, Letter to the Grand Duchess Christina (1615), from Stillman Drake, transl., *Discoveries and Opinions of Galileo* (1957), p. 186, reprinted in D.C. Goodman, editor, *Science and Religious Belief 1600-1900: A Selection of Primary Sources* (Bristol: J. Wright [for] the Open University Press, 1973), p. 34.

most appropriate aids in the true exposition of the Bible.<sup>4</sup>

With frequent reference to Galileo, this approach to the relation of science to the interpretation of Scripture was demanded by all the opponents of the British scriptural geologists of the early 19th century. The old-earth proponents believed that, prior to the work of Copernicus, Kepler, and Galileo, it was quite natural for Christians to take various verses in the Bible to imply an immovable earth surrounded by the revolving heavenly bodies because they had no philosophical or observational reasons to think otherwise. But once the new mathematical descriptions and telescopic observations had been made known, they were forced to reinterpret those verses so as to remove the apparent contradiction between the truth revealed by Scripture and that revealed by God's creation. In exactly the same way, the old-earth proponents reasoned, geology has brought forward observational proof that the earth is much older than previously thought and so Christians must interpret Genesis 1 and 6–9 differently, so as to harmonize Scripture with this newly discovered teaching of creation.<sup>5</sup>

It should be noted now that the Galileo affair was focused exclusively on the present structure and operation of the universe, rather than on how it came into being and attained its present arrangement. By way of comparison, Galileo interpreted the account of the miracle of the long day of Joshua 10:12–15 as literal history, though he explained the stationary position of the sun in terms of Copernican theory and the language of appearance. He apparently also took the account of the creation of the sun on the fourth day of Genesis 1 to be literal history.<sup>6</sup> At the end of this book I will return to this distinction between what are sometimes called “operation science” and “historical science.”

## BACONIAN SCIENCE

The famous English politician and philosopher Francis Bacon (1561–1626) also had an enormous influence on the subsequent development of science and on the views of later Christians regarding the relationship of Scripture to science. He too promoted the separation of Scripture from scientific study of the physical world. Bacon advocated the concept of the two books of God: the book of Scripture and the book of nature. In *Advancement of Learning* (1605) he made his well-known statement of the relationship of Scripture to nature:

For our Saviour saith, “You err, not knowing the Scriptures, nor the power of God;” laying before us two books or volumes to study, if we will be secured from error; first the Scriptures, revealing the will of God, and then the creatures expressing his power; whereof the latter is a key unto the former: not only opening our understanding to conceive the true sense of the Scriptures, by the general notions of reason and rules of speech; but chiefly opening our belief, in drawing us into a due meditation of the omnipotency [*sic*] of God, which is chiefly signed and engraven upon his works.<sup>7</sup>

Later in the same work he criticized the “school of Paracelsus”<sup>8</sup> and others for pretending “to find the truth of all natural philosophy in the Scriptures; scandalizing and traducing all other philosophy as heathenish and profane.” He continued in general terms:

For to seek heaven and earth in the word of God, whereof it is said, “Heaven and earth shall pass, but my word shall not pass,” is to seek temporary things amongst eternal; and as to seek divinity in philosophy is to seek the living amongst the dead,

4 Ibid., in Drake, *Discoveries and Opinions of Galileo* (p. 182–183); and in Goodman, *Science and Religious Belief 1600-1900* (p. 32–33).

5 It will be seen later, however, that this thinking developed in stages in geology generally and in the minds of individual geologists. At first only Genesis 1 was reinterpreted, while the Flood of Genesis 6–9 was seen as a global, geologically significant event. After 1830, Genesis 6–9 was reinterpreted to mean a local and/or geologically insignificant flood.

6 See Galileo Galilei, Letter to the Grand Duchess Christina (1615), from Drake, *Discoveries and Opinions of Galileo*, p. 211–216), reprinted in Goodman, *Science and Religious Belief 1600-1900*, p. 47–49.

7 Francis Bacon, *The Advancement of Learning* (1906 Oxford edition), p. 46 (Book I, part VI.16).

8 Paracelsus (1493?–1541) was a Swiss doctor and chemist.