

**Exegeting Nature and Scripture:
Hermeneutics and Reality**
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This chapter could have been titled "Interpreting Nature and Scripture: Principles and Reality." Instead, I used the theological terms "exegeting" and "hermeneutics" even though I don't like jargon. "Hermeneutics" is derived from a Greek word meaning to interpret, explain or translate. In English, the term is used to designate theories, principles or approaches for interpreting a written text or spoken utterance. "Exegeting" comes from another Greek word meaning to tell, explain, make known or reveal. This term in English designates the actual practice of interpreting a text or utterance. I have used these technical terms to point to parallels between interpreting nature and interpreting Scripture and to suggest that both activities are theological in character.¹

Sources of Information: a Spectrum

In seeking to determine what reality is like, there are many proposed methods. For this discussion, we will follow more or less empirical approaches. We will further confine ourselves to those views which use as sources of information either or both the physical world and the Bible, leaving out those which add or substitute some other sacred writing such as the Qur'an, the Book of Mormon, or the Bhagavad-Gita.

Within our restricted set, we may organize the various views into a spectrum based on how they regard the value and reliability of these two sources. At the left end of the spectrum is atheism, which sees the Bible as merely the (largely erroneous) ideas of the ancients. Thus atheists make no use of Scripture in constructing either their science or theology, except as an example of various ideas people have had about both. Typically they deny God's existence and claim that nature is not a created reality.²

To the right of atheism is liberal theism. Like atheists, liberals wouldn't think of exegeting Scripture for what to believe about scientific matters. Unlike atheists, they do use the Bible for theological input but don't accept all it teaches. Liberals see the Bible as giving us the theological insights of its human authors, some of which are valid, some mistaken. Typically liberals recognize the existence of a God with some of the characteristics presented in Scripture, and see nature as made by God using (almost) purely natural processes.³

Further to the right is a position we will call evolutionary evangelicalism for lack of a standard term. Here the Bible, though seen as generally accurate or even inerrant, was not written to provide any scientific detail. Nature alone must be exegeted to answer scientific questions. The Bible, however, gives the true theological significance not only of strictly theological matters but of scientific ones as well. Typically they see the God of the Bible as creating through evolutionary processes, and Scripture as giving theological truths in the language of ancient cosmologies.⁴

Next is old-earth creationism, which sees nature and Scripture as each inerrant revelations of God. Both sources provide accurate information about reality, and neither is to be

arbitrarily restricted in its subject matter. Nature may tell us about theology as well as science, and the Bible about science as well as theology. As a result, both sources need to be exegeted together for a proper view of reality. Typically they have God creating by a combination of miraculous intervention and providential processes over a long period of time. Usually biological macroevolution is denied.⁵

Beyond this view is young-earth creationism. Like the former, it views both nature and Scripture as revelations from God but tends to downplay the inerrancy of nature. For the repeatable (experimental, laboratory) sciences, nature is allowed to judge what statements in Scripture are to be taken figuratively. But for the non-repeatable (historical) sciences, the exegesis of Scripture takes priority over exegesis of nature and controls decision-making. Typically they see God creating the heavens and earth a few thousand years ago with such appearance of age as is necessary to fit geological and astronomical data.⁶

At the right end of this spectrum (or so far as we will go here) is what we may call Ptolemaic creationism. The simplest exegesis of Scripture is given complete priority over the exegesis of nature, not only for the historical sciences but for the experimental ones as well. Typical results are a God who created the earth a few thousand years ago, not only with an appearance of age, but with the sun and stars circling the earth once a day in spite of the contradictory claims of modern science.⁷

Some Hermeneutical Issues

Even this brief sketch suggests many questions regarding method and validity in interpretation. How reliable are these two sources, nature and Scripture? Is there any way we can test their reliability? Given that one or both is reliable, how clear is the message provided? What was the intention of the human author of a particular Scripture passage? What the intention of the divine author of that passage? What the intention of the divine author of some "passage" in nature? How successful have interpreters been in decoding the messages of these sources? How active has God been in nature and in Scripture? What is the character of his activity in these realms? Has it been only providential or has it been partly miraculous intervention? Has the character of his activity been different in one source than in the other? In Scripture, does the human author never say more than he or his contemporaries could have discovered on their own? Does the divine author ever influence the production of the text so that it conveys more than the human author actually knew? How would we recognize a parallel between the biblical cosmology and other ancient cosmologies? How a parallel between biblical cosmology and modern? How are various interpretive options tested? How tested in literature? How in science?

These questions cannot be answered in a mere chapter, and only God knows the answer to some of them. Here we attempt to discuss several and to argue that the fourth option C old-earth creationism C seems the best alternative.

Consider the first option, atheism. This approach has had a powerful influence in society

today, far beyond the number of its proponents. Yet, even if we ignore Scripture, a straight-forward exegesis of nature seems to make this option a desperate choice in which worldview commitments are distorting the evidence.⁸

Consider liberal theism. This view, along with such options as advocate other sacred writings than the Bible as sources, face serious difficulties incorporating the evidence Scripture provides that it really is an accurate revelation from the God who exists.⁹

In this chapter we will concern ourselves mainly with options to the right of liberal theism, all of which can be classed as varieties of orthodox or evangelical methodology.

God's Intentions in Nature and Scripture

Among these alternatives, the main questions which divide the views turn on the intention of the divine author. Did God intend nature to teach any theology? Did he intend Scripture to teach any science? Are nature and Scripture inerrant revelations? Did he intend that one source take precedence over the other, either in general or in some particular area? Further, does God's providential upholding and guidance of nature allow room for his miraculous intervention? And does God's guidance of the human authors of Scripture allow for miraculous revelation?

According to Scripture, God did intend nature to teach some theology. Psalm 19 tells us that the heavens declare God's glory and craftsmanship. Romans 1 affirms that certain invisible characteristics of God C his deity and eternal power C are made known by what he has made, and that humans are without excuse for reaching wrong conclusions about these. The Bible certainly claims that nature teaches theological truth. This does not answer the question regarding how much theology nature teaches, which has been debated for centuries. But it would not be unreasonable to think this should be solved by actually looking at nature and seeing what sort of case can be made for various alternatives.

Whether God intended Scripture to teach any science can be debated, and turns to some extent on our definition of "science" as content or method.¹⁰ A number of passages in the Bible certainly look like it was God's intent to teach some of the *content* of science. For instance, the creation account in Genesis 1-2, no matter how figuratively expressed, appears to be saying something detailed about the objects of God's creative activity, giving at least a partial list of what they are, and claiming that they have not always existed. The amount and nature of the detail this passage gives also suggests it teaches even more than this. That this additional teaching might be something about means and sequence is explicitly warranted by the account. The common view that the detail provides a polemic against pagan polytheism, though a reasonable guess, is by contrast only an inference.¹¹

The Proverbs 8 creation passage is also explicit about a beginning, before which these created objects did not exist. A major teaching of the passage is that wisdom was present in all God's creative activity. This suggests that phenomena characteristic of skill and craftsmanship

should be discernable in nature.¹² So it seems that Scripture does teach some science as well as theology, and that we impose arbitrary limitations on the Bible when we insist that it may only tell us the "who" and "why" of creation but nothing of the "what," "how," and "when." The extent of its teaching on science is apparently another question which must be answered by an actual examination of the phenomena of Scripture.

Are nature and Scripture inerrant revelations of God? I believe this is the claim of the Bible itself. The evidence provided for Scripture being a revelation of the God who exists, together with its own claims regarding its inerrancy suffice for the one side.¹³ Opponents of the inerrancy of Scripture can, of course, raise various empirical objections, and dismiss attempts to answer these as misguided; but exactly the same sort of arguments can be raised about the goodness of God and the sinlessness of Christ. If biblical Christianity is true, it seems that these three theological claims stand together.

As for the inerrancy of nature, Scripture's own statements that nature is a revelation of God and that God is unable to lie seem to me to suffice.¹⁴ Here, too, one could argue that mankind's fall and the resulting curse somehow cancel this, but I do not see any evidence for this in Scripture. Of course, humans now have a strong tendency to distort data to justify themselves, but they will do this with Scripture just as they will with nature. More evidence than this cannot, I think, be provided for us humans, since we are unable to escape the universe and see it from the outside for ourselves.

Did God intend one of these sources C nature or Scripture C to take precedence over the other, either in general or in some particular area? Here our four views most strongly part company. Those holding an evolutionary evangelical view often compartmentalize the two sources, allowing nature to take precedence in scientific areas and Scripture in theological areas.¹⁵ The young-earth option gives the precedence to Scripture for both science and theology in historical matters,¹⁶ and the Ptolemaic version gives Scripture precedence in all cases.¹⁷

The old-earth creation alternative involves some variety here (as do all these views), but our discussion will become too complex if we continually take account of this. The particular version we advocate sees both nature and Scripture as revelations from God, both inerrant, both speaking to science and theology, and both to be taken seriously in each of these areas. Thus in general neither has precedence over the other.

This needs to be somewhat qualified, however, due to the distinct nature of the two revelations. Scripture and nature have differing but overlapping subject matter. The Bible is presented in human language (directly in the ancient Hebrew, Aramaic, and Greek; more remotely in subsequent translation); nature transcends human language (Ps 19:2-4). Scripture is rather succinct (a typical Bible has perhaps 1500 pages when printed in a modern, standard-size typeface); nature overwhelms us with the mass of data it provides. This suggests that perhaps nature will take precedence over Scripture in some cases, as it may often carry most of the shaping information.

On the other hand, God has already put Scripture into human language, while our interpretation of nature is inference from a prelinguistic form. And in Scripture God presents a selection of the data that we especially need in order to be equipped for every good work (2 Tim 3:16). This suggests that Scripture should have priority where it speaks especially to human needs. And since "teaching" and "every good work" may be quite broad, it should probably be given priority wherever it seems to speak explicitly to the subject at hand. However, we need to be very cautious in pressing its silences or making great leaps of inference from it. Any explicit information from one source should not be steam-rolled by allegedly simplest interpretations of the other source.

The language of Scripture, like ordinary speech, is sometimes literal and sometimes figurative. Jesus' example in his teaching technique shows that God has no qualms about using either. Yet we interpreters sometimes have difficulty deciding which is being used in a particular case. Does anything like figurative language occur in nature? Perhaps when the data give an initial impression that differs from the actual facts of the matter. For instance, matter looks quite solid on the macroscopic level, but rather empty on the sub-atomic scale. Perhaps something of figurative language in nature is also suggested in the concept of creation with the appearance of age. Adam looked like he was (say) twenty-five years old, but he was created just a few moments before. Perhaps the wine Jesus created tasted like it was aged, though it really wasn't. Are such different impressions at different size-scales in nature more or less common than figurative language in Scripture? How common is creation with apparent age? In both nature and Scripture, the very character of revelation as communication would suggest that some kind of definite evidence is needed to justify opting for figurative interpretation.

The upshot of all of this is to suggest that neither nature nor Scripture takes precedence in any mechanical sense. Both sources need to be treated carefully and even-handedly on a case-by-case basis. And where nature and Scripture appear to disagree, then (if orthodox Christianity is true) we are doing something wrong in our interpretation of one or both sources.

The God of the Gaps

How much of what happens in nature and history is God's providential working through natural law, and how much is his miraculous intervention? This is the so-called "God of the gaps" question. Evangelicals have typically suggested he has worked innumerable miracles both at creation and since then. Deistic attacks on miracle in the eighteenth century, plus Darwin's work in the nineteenth proposing connections by natural descent between all living things, put pressure on this view. Later it was severely ridiculed by Andrew Dickson White in his *History of the Warfare of Science with Theology in Christendom*.¹⁸ White gave many examples from church history where Christians saw direct miraculous causation for events we now have good reason to believe are explicable by natural laws.

As a result, evangelicals today are sometimes quite reluctant to invoke a "God of the gaps." Some (such as Howard Van Till) go so far as to argue that God has made nature with a "functional integrity" such that he almost never miraculously intervenes in its operations, not

even in creation. The only exceptions would be the original creation of matter-energy and the miracles associated with redemption recounted in the Old and New Testaments.¹⁹

But in fleeing ridicule we can easily fall into the opposite error if we do not watch where we are going. Admittedly, Christians in the past as competent as Isaac Newton have mistakenly plugged God's direct action into what later turned out to be merely gaps in their knowledge of natural law.²⁰ It does not follow from this, however, that all gaps in our knowledge will eventually be filled by natural law. This is the other extreme, the "natural law of the gaps" assumption; it is currently only a worldview or a research program, not an experimental result.

In this life there will always be gaps in our knowledge of reality. How, from inside the universe, could we ever tell when we had finally gotten to the bottom of things? And some of the gaps we do know about look far more serious than just adding decimal places to physical constants. We certainly do not know (except by definition) that the "cosmos is all that is, or ever was, or ever will be," as even several cosmologists are reluctantly admitting.²¹ We do know that the microstructure of matter descends through atoms to nuclei to neutrons and protons to quarks, but we don't have any idea whether this last level is the metaphysical basement or not. And the gaps in natural law that surround the origins of universe, life and mind look like the sort that mindless principles cannot handle.²² So there seems to be good evidence for gaps that natural law alone cannot fill.

Of course, Scripture, too, has gaps in its revelation that we sometimes fill without even realizing it. Besides the classic assumptions that there were three wise men,²³ and that Methuselah was the oldest person ever to live,²⁴ we often forget that the Bible tells us almost nothing about the creation of angels,²⁵ the rebellion of Satan,²⁶ and whether or not there was animal death before Adam sinned.²⁷ One reason for so much diversity among interpreters of Genesis, even among those with the same viewpoint, is that the biblical account is underspecified relative to the large number of things that must have actually happened. Here, too, mistakes in filling gaps can cause trouble in finding a match between nature and Scripture.

Another type of gap needs to be considered in connection with Scripture. Evangelical Christians agree that God can miraculously reveal things to Scripture characters or writers that they otherwise would not know. Thus Jacob is given insight into what will happen to his descendants (Gen 49). Isaiah is told that the Suffering Servant will be punished for our sins, have his grave with a rich man rather than the wicked, and prolong his days after giving himself as a guilt offering (Isa 53), all marvelously fulfilled in Jesus. Both of these examples were apparently recorded more for the benefit of later generations than for the original hearers. Is it possible that God has done something similar with items of scientific knowledge in the Bible? Without explicit claims by the Bible one way or the other, it would seem that only an investigation of the phenomena of Scripture could settle this question.

Somewhat related to this is the question whether a text of Scripture could properly mean something that was not in the mind of the human author. That is, could the divine author provide information that the human author did not intend or was even unaware of? This has been

debated both within and outside evangelical circles. The Bible answers this question in the affirmative, without committing itself on how much such material we should expect. For instance, John 11:47-52 tells us that Caiaphas, the high priest at the time of Jesus' crucifixion, spoke more than he knew when he said it was expedient that one man should die for the people rather than the whole nation be destroyed, and that this was actually a prophecy given him in respect of his office. Similarly, 1 Peter 1:10-12 tells us that the Old Testament prophets who predicted the coming and work of Christ did not themselves understand everything they received, but it was revealed to them that they were serving generations to come. Might there not, then, be examples of preknowledge of science in Scripture that were intended for modern generations and not detectable until recently (or even still undetected)? If God is the ultimate author of Scripture, why should parallels between biblical cosmology and modern be unthinkable, whereas parallels between biblical cosmology and ancient pagan be emphasized? Again, the existence and nature of such material can only be established by arguments based on the actual data of the text.

Theology Squelching Research

Does theology interfere with scientific research? Yes, it often does. But not just orthodox theology. As Thomas Kuhn has pointed out in his book, *The Structure of Scientific Revolutions*, scientists will investigate what they are interested in, and they will look where they think they might get significant results.²⁸ No one will intentionally waste time on investigations that lead to dead ends. Whether an individual scientist is an atheist or a fundamentalist will strongly influence what kind of research is thought profitable. And to a significant extent, the same can be said for group choices, whether that of the scientific community as a whole, the individual disciplines therein, or the publication decisions of scientific journals in particular.

There is also the matter of funding. Before about 1850, most scientists were amateurs and worked on what interested them. Some of these were supported by wealthy patrons and so spent part of their time on what the patron wanted. By contrast, most science done in the twentieth century has been funded by governments or foundations. Scientists today work on what the funding organization (or some subgroup thereof) thinks worthwhile. Naturally an organization will not want to fund research that undercuts its own theological agenda. So the Tychonian Society doesn't fund research likely to prove the earth goes around the sun. The Creation Research Society won't support studies favorable to evolution. The American Tobacco Institute will not encourage research showing a strong linkage between smoking and cancer. The US government won't make grants for projects looking for intelligent design in nature. In fact, the current interpretation of the US Constitution on church-state relations and the political correctness movement can be just as effective in keeping research from being funded as any denominational statement of faith, and there is typically much more money at stake.

Whether a particular theological outlook will actually hinder or help research in a given field depends on whether the theological position agrees with or contradicts reality in that particular area. Several historians have noted that Christian theology was favorable to the rise of modern science.²⁹ Most would agree that the assimilation of Christian theology to Ptolemaic astronomy in the 1600s interfered with Galileo's research and publication activities.³⁰ Many feel

that the commitment of some evangelical groups to an age of the earth of only a few thousand years has stifled geological and astronomical research and education among their adherents.³¹ It seems to me that commitment to a "blind watchmaker" form of evolution has had comparable effects on a much wider scale because of rampant secularism in the groups funding scientific research.³² If we really want to find out how things actually are, a premature commitment to certain details, to specific hermeneutical principles, or even to whole worldviews may interfere with our goal.

Some Hermeneutical Suggestions

Well, then, how are we to exegete nature and Scripture? Cautiously C since we are finite and sinful humans, and our God is a God of surprises. But not so cautiously as never to reach the conclusions we need to reach in this life. If we believe orthodox Christianity is actually true, then the existence of God and some of his attributes are sufficiently clear that we will have no one to blame but ourselves if we do not acknowledge this and act appropriately upon it. One of these characteristics is that God is the creator of the universe and of ourselves in particular.

It can be dangerous to construct too detailed a set of hermeneutical principles, lest by means of these principles we distort what the source is actually telling us. On the other hand, if we never decide where to look for truth, we probably won't find any. Some principles, like the law of non-contradiction, or that seeking truth is worthwhile, are necessary even to begin.

In emphasizing the similarity between nature and Scripture as sources of information about both science and theology, it is well to keep in mind that Scripture is a text of fixed length, to which we are probably not to expect any additions until Jesus returns. Nature, too, is presumably fixed in extent (assuming the expansion of the universe does not add any information to it), but each time we build a larger telescope, a more powerful microscope, or a device for detecting more of the electromagnetic spectrum, we open a new page of nature we have never seen before. It should not be surprising, then, that we will frequently have to re-examine our harmonizations of nature and Scripture, and usually that will be because our knowledge of the former rather than the latter has expanded.

The Bible is very explicit about the existence of an unseen spiritual realm in addition to the world we can study with our senses. This spiritual realm is not just the world of ideas proposed by Plato, but includes personal beings higher than humans and lower than God. These are given a variety of names in Scripture, but we commonly lump them into the two categories angels and demons. It should not be assumed that these beings had nothing to do with creation, or at least with the way the world looks today. Unfortunately, this provides another source of causation we need to take into account but don't have enough information on how to do so. It adds considerable uncertainty whether, in a particular case, we have a full explanation of a given event.

More could be said. The task of interpreting nature and Scripture is a daunting one, but it is one which God has laid upon us. We can do no better than to apply the maxim of the

prophet Micah (6:8), "What does the Lord require of you, but to do justly, love mercy, and walk humbly with our God?"

References:

1. See Vern S. Poythress, *Science and Hermeneutics* (Grand Rapids: Academie, 1988) for parallels between science and biblical interpretation; see Roy A. Clouser, *The Myth of Religious Neutrality* (Notre Dame: University of Notre Dame Press, 1991) for the pervasive influence of religious belief in all theorizing.
2. George Gaylord Simpson, *The Meaning of Evolution* (New Haven: Yale University Press, 1949); Isaac Asimov, *Asimov's Guide to the Bible*, 2 vol. (New York: Avon, 1971); Carl Sagan, *Cosmos* (New York: Random House, 1980); Richard Dawkins, *The Blind Watchmaker* (New York: Norton, 1986); Stephen Jay Gould, *Wonderful Life* (New York: Norton, 1989).
3. Gerhard von Rad, *Genesis: A Commentary* (Philadelphia: Westminster, 1961); Walter Brueggemann, *Genesis* (Atlanta: John Knox, 1982); Claus Westermann, *Genesis 1-11: A Commentary* (Minneapolis: Augsburg, 1984); Conrad Hyers, *The Meaning of Creation* (Atlanta: John Knox, 1984).
4. Richard H. Bube, ed. *The Encounter Between Christianity and Science* (Grand Rapids: Eerdmans, 1968); Richard T. Wright, *Biology Through the Eyes of Faith* (San Francisco: Harper and Row, 1989); Howard J. Van Till, Robert E. Snow, John H. Stek, and Davis A. Young, *Portraits of Creation: Biblical and Scientific Perspectives on the World's Formation* (Grand Rapids: Eerdmans, 1990).
5. J. Oliver Buswell, Jr., *A Systematic Theology of the Christian Religion* (Grand Rapids: Zondervan, 1962); Robert C. Newman and Herman J. Eckelmann, Jr., *Genesis One and the Origin of the Earth* (Downers Grove, IL: Inter-Varsity, 1977; reprint, IBRI, 1991); Pattle P. T. Pun, *Evolution: Nature and Scripture in Conflict?* (Grand Rapids: Academie, 1982); John L. Wiester, *The Genesis Connection* (Nashville: Thomas Nelson, 1983; reprint, IBRI, 1992); Russell Maatman, *The Impact of Evolutionary Theory: A Christian View* (Sioux Center, IA: Dordt College Press, 1993). Not all advocates of this position are Christians, e.g., Nathan Aviezer, *In the Beginning: Biblical Creation and Science* (Hoboken, NJ: KTAV, 1990).
6. Henry M. Morris, *The Genesis Record* (Grand Rapids: Baker, 1976); Weston W. Fields, *Unformed and Unfilled* (Nutley, NJ: Presbyterian and Reformed, 1976); Allen P. Ross, *Creation and Blessing: A Guide to the Study and Exposition of Genesis* (Grand Rapids: Baker, 1988). Not all proponents of this approach are Christians, either; see Yaakov Kornreich, ed., *A Science and Torah Reader* (New York: National Conference of Synagogue Youth, 1970).
7. Edward F. Hills, *Space Age Science*, 2nd ed. (Des Moines, IA: Creation Research Press, 1979); James Hanson, *A New Interest in Geocentricity* (Minneapolis: Bible-Science Association, 1979); Geerhardus Bouw, *With Every Wind of Doctrine: Biblical, Historical and Scientific Perspectives*

on *Geocentricity* (Cleveland: Tychonian Society, 1984).

8. See J. P. Moreland, ed. *The Creation Hypothesis* (Downers Grove: Inter-Varsity, 1994); Hugh Ross, *The Creator and the Cosmos* (Colorado Springs: NavPress, 1993); William Lane Craig, *Reasonable Faith: Christian Truth and Apologetics* (Wheaton, IL: Crossway, 1994). See also R. C. Sproul, *The Psychology of Atheism* (Minneapolis: Bethany House, 1974); Robert A. Morey, *The New Atheism and the Erosion of Freedom* (Minneapolis: Bethany House, 1986; reprint Phillipsburg, NJ: Presbyterian and Reformed, 1994); Ravi Zacharias, *A Shattered Visage: The Real Face of Atheism* (Grand Rapids: Baker, 1990).

9. See, e.g., Robert C. Newman, ed., *Evidence of Prophecy: Fulfilled Prediction as a Testimony to the Truth of Christianity* (Hatfield, PA: Interdisciplinary Biblical Research Institute, 1990); John Warwick Montgomery, ed., *Evidence for Faith: Deciding the God Question* (Dallas: Probe/Word, 1991); Eta Linnemann, *Historical Criticism of the Bible: Methodology or Ideology?* (Grand Rapids: Baker, 1990); Josh McDowell and Bill Wilson, *He Walked Among Us: Evidence for the Historical Jesus* (San Bernardino, CA: Here's Life, 1988); Craig, *Reasonable Faith*; William Campbell, *The Qur'an and the Bible in the Light of History and Science* (n.p.: Middle East Resources, 1992); Vishal Mangalwadi, *The World of Gurus: A Critical Look at the Philosophies of India's Influential Gurus and Mystics* (Chicago: Cornerstone, 1992).

10. We pursue the content of science in the text. Regarding method, no specific professional class of scientists existed in ancient Israel or the early church. However, Scripture does not encourage blind faith (due to the existence of evil spiritual beings and human charlatans), and it emphasizes the importance of multiple, consistent, eyewitness testimony in judicial matters and the necessity of testing spiritual claims.

11. See discussions, pro and con, on this in *The Genesis Debate*, ed. Ronald F. Youngblood (Nashville: Thomas Nelson, 1986). Also Henri Blocher, *In the Beginning: The Opening Chapters of Genesis* (Leicester/Downers Grove: Inter-Varsity, 1989).

12. And they are, though one of the goals of atheistic versions of evolution has been to banish design arguments, e.g., Richard Dawkins, *The Blind Watchmaker* (New York: Norton, 1986); but see J. P. Moreland, ed., *The Creation Hypothesis*, especially the chapter by William Dembski.

13. See, e.g., John W. Wenham, *Christ and the Bible* (Downers Grove, IL: InterVarsity, 1972).

14. Scripture on nature as revelation: Ps 19:1-4; Acts 14:16-17; Rom 1:18-20; that God cannot lie: Ex 34:6; Num 23:19; 2 Sam 7:28; Ps 31:5; Isa 65:16; Tit 1:2; Heb 6:18.

15. According to Wright, *Biology Through the Eyes of Faith*, pp. 65-66, Scripture may provide "framing principles" for science, but not data or theories. According to Richard H. Bube, "Seven Patterns for Relating Science and Theology," in *Man and Creation: Perspectives on Science and Theology*, ed. Michael Bauman (Hillsdale, MI: Hillsdale College Press, 1993), pp. 96-101,

"theology is incapable of providing mechanistic information about the 'how' questions of the physical universe."

16. As Marvin L. Lubenow, in *Bones of Contention: A Creationist Assessment of Human Fossils* (Grand Rapids: Baker, 1992), pp. 145-146, characterizes it, the Bible provides information about the past, science only provides information about the present.

17. "We hold that the only absolutely trustworthy information about origin and purpose of all that exists and happens is given by God . . . in His infallible Word, the Bible. All scientific endeavour which does not accept this Revelation from on High without any reservations, literary, philosophical or whatsoever, we reject as already condemned in its un-provable first assumptions. We believe in a Creation completed in six twenty-four hour days and in a world not older than about six thousand years, but beyond that we maintain that the Bible teaches us an Earth that cannot be moved, at rest with respect to the Throne of Him, Who called it into existence, and hence absolutely at rest in the centre of the Universe." From announcement of "Biblical Cosmology and Geocentricity," a conference to be given at Cleveland State University, June 5-7, 1978, apparently sponsored by the Tyconian Society and the Bible-Science Association.

18. Andrew Dickson White, *A History of the Warfare of Science with Theology in Christendom*, 2 vols. (1896; reprint, New York: Dover, 1960).

19. Howard J. Van Till, "When Faith and Reason Meet," in *Man and Creation*, ed. Bauman, pp. 141-164.

20. Richard H. Bube, "The Failure of the God-of-the-Gaps," in *Horizons of Science*, ed. Carl F. H. Henry (New York: Harper and Row, 1978), pp. 27-29.

21. Some cosmologists are moving to a scheme in which our universe is imbedded in an infinite one; e.g. Richard Gott, "Creation of Open Universes from de Sitter Space," *Nature* 295 (1982): 304-307.

22. See Moreland, *Creation Hypothesis*; also Michael J. Behe, "Experimental Support for Regarding Functional Classes of Proteins to Be Highly Isolated from Each Other," *Darwinism: Science or Philosophy?* ed. Jon Buell and Virginia Hearn (Richardson, TX: Foundation for Thought and Ethics, 1994), pp. 60-71; and William A. Dembski, "The Incompleteness of Science Naturalism," in *ibid.*, pp. 79-94.

23. Matt 2:1-12; their number is not specified in the text, and was later supplied by tradition (along with names) from who knows what source.

24. Gen 5:25-27; this is the greatest age at death recorded for anyone in the Bible, but no hint is given that no one ever lived longer than this.

25. Angels are mentioned as created beings in a few places (e.g., Neh 9:6, Col 1:16), but no narrative of their creation is given. The Pseudepigraphal Book of Jubilees assigns this to first day of creation (Jub 2:2). Scripture, however, seems to hint that their creation preceded that of our universe; consider the reference in Heb 9:11 to the heavenly tabernacle not being of this creation.
26. Here, too, just hints: perhaps Ezek 28:12-19; condemnation of the Devil, 1 Tim 3:6; rebellion of the dragon, Rev 12:4.
27. This is a watershed issue between young-earth and old-earth views.
28. Thomas S. Kuhn, *The Structure of Scientific Revolutions* (Chicago: University of Chicago Press, 1961), e.g., chaps 2 and 3; see also Clouser, *Myth of Religious Neutrality*, chap 4.
29. R. Hookas, *Religion and the Rise of Modern Science* (Grand Rapids: Eerdmans, 1972); Stanley L. Jaki, *The Origin of Science and the Science of its Origin* (Edinburgh: Scottish Academic Press, 1978); John Hedley Brooke, *Science and Religion: Some Historical Perspectives* (Cambridge: Cambridge University Press, 1991); Nancy R. Pearcey and Charles B. Thaxton, *The Soul of Science: Christian Faith and Natural Philosophy* (Wheaton, IL: Crossway, 1994).
30. Charles Hummel, *The Galileo Connection* (Downers Grove, IL: Inter-Varsity, 1986); James Reston, Jr., *Galileo: A Life* (New York: Harper Collins, 1994).
31. See Ronald L. Numbers, *The Creationists* (New York: Knopf, 1992); Daniel E. Wonderly, *Neglect of Geologic Data: Sedimentary Strata Compared with Young-Earth Creationist Writings* (Hatfield, PA: Interdisciplinary Biblical Research Institute, 1987, 1993).
32. Phillip E. Johnson, "What is Darwinism?" in *Man and Creation*, pp. 177-199; Clouser, *Myth of Religious Neutrality*.

Annotated Bibliography

Bauman, Michael, ed. *Man and Creation: Perspectives on Science and Philosophy*. Hillsdale, MI: Hillsdale College Press, 1993.

Richard Bube, Owen Gingerich, and Howard Van Till square off against Michael Bauman, Phillip Johnson and J. P. Moreland on whether science and theology should operate in a basically complementary, non-overlapping way, or whether both have something very important to say about the same questions and subjects.

Brooke, John Hedley. *Science and Religion: Some Historical Perspectives*. Cambridge: Cambridge University Press, 1991.

A historical study of the mutual interactions of science and religion in the West, showing that an emphasis on conflict between them gives only part of the story, and needs to be supplemented by recognizing that they sometimes function in a complementary way (answering different questions), and at other times interact in ways that are mutually helpful.

Clouser, Roy A. *The Myth of Religious Neutrality: An Essay on the Hidden Role of Religious Belief in Theories*. Notre Dame: University of Notre Dame Press, 1991.

Defines religious belief broadly as "belief in something or other as divine," namely "having the status of not depending on anything else." In this sense, religious belief underlies all theorizing. Gives examples from mathematics, physics and psychology. Promotes a distinctively Christian mode of theorizing as developed by philosopher Herman Dooyeweerd.

Hirsch, E. D., Jr. *Validity in Interpretation*. New Haven: Yale University Press, 1967.

Advocates objective criteria by which to understand a literary text. A valid interpretation is not necessarily one which is certainly correct (if we are not the author), but one which has a high probability of being correct since it is built on a responsible handling of the internal and external evidence.

Kuhn, Thomas S. *The Structure of Scientific Revolutions*. Chicago: University of Chicago Press, 1961.

Revolutionized discussions of the philosophy of science by distinguishing, for any particular discipline, times in which "normal science" is operating under the influence of a controlling paradigm from other times in which two or more paradigms are competing for the allegiance of the investigators.

Maatman, Russell. *The Impact of Evolutionary Theory: A Christian View*. Sioux Center, IA: Dordt College Press, 1993.

Coverage is much broader than the title might indicate. Deals with evidence for and objections to design, the problems that arise in explaining the origin of life and its present diversity naturalistically. Excellent discussions on general and special revelation, the Bible and science, and what science is. Interacts with Stek and Van Till.

McIver, Tom. *Anti-Evolution: An Annotated Bibliography*. Jefferson, NC: McFarland and Co.,

1988.

An annotated bibliography of over 1850 books that have an anti-evolutionary perspective, mostly from a conservative Christian perspective, but including agnostics and occultists as well. Has indices of names, titles and subjects. Recently reprinted by Johns Hopkins University Press.

Pearcey, Nancy R. and Charles B. Thaxton. *The Soul of Science: Christian Faith and Natural Philosophy*. Wheaton: Crossway Books, 1994.

A distinguished and readable tour of the history of modern science, showing how Christianity has been a major player among the worldviews which have shaped science.

Poythress, Vern S. *Science and Hermeneutics: Implications of Scientific Method for Biblical Interpretation*. Grand Rapids: Academie, 1988.

Sees some striking parallels between Biblical interpretation and science, especially as the latter is viewed by Thomas Kuhn. Emphasizes the influence of paradigm on interpretive choices, and how this can be taken into account by awareness of other paradigms.

Ramm, Bernard. *A Christian View of Science and Scripture*. Grand Rapids: Eerdmans, 1954.

A good tour of historical, theological and scientific materials relevant to the subject, well-assimilated, with many excellent suggestions regarding a Christian response and synthesis. After explaining why Christians shouldn't be concerned about evolution as such, his section on anthropology suggests the situation is more serious than this.

Wright, Richard T. *Biology Through the Eyes of Faith*. San Francisco: Harper and Row, 1989.

Written as a supplement to college biology texts by an evangelical evolutionist. Discusses worldviews, God and his world, relating science and Christianity, origins (favors a complementarian approach, using Blocher's framework hypothesis, non-committal on evolution of humans). Also introduces biblical teaching on our stewardship responsibility to the environment, and the biomedical and genetic revolutions.