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Scientific World Pictures Within the Bounds of a Christian Worldview

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We have assembled here today as members of the Christian family. More specifically, we are Christians who stand in the heritage of the Reformation and who desire to apply a Reformed perspective to the task of critically evaluating an important issue that we face as members of a late 20th-century, scientifically-informed, Western culture.

The questions posed for our reflection and discussion at this conference are these: (1) What does having a Christian worldview mean concerning the way we should conduct scientific investigation in general? and (2) What does having a Christian worldview mean concerning the way we should evaluate the contemporary creation-evolution debate?

I have long been deeply interested in both of these questions, and consequently I appreciate the opportunity to address them in this setting. I shall often take a rather personal approach, frequently stating my own position or perspective. However, because of time limitations, I shall not always be able to provide extensive warrant or basis for my positions or to acknowledge the many sources that have contributed to my perspective.

With that understanding, then, let us proceed.

What is a Christian Worldview?

A definition

If we wish to reflect insightfully on some of the implications of a Christian worldview, we must first establish a working definition for the term “worldview.” As I shall use the term, a *worldview* is a set of fundamental beliefs concerning the ultimate nature of reality. Ordinarily it is expressible as a set of propositions concerning the identity of and interrelationships among God, mankind and the rest of the world. A worldview is normally all-inclusive, concerned with both the physical and the non-physical, both the immanent and the transcendent. Insofar as it is concerned with the physical universe, a worldview incorporates answers to questions about the physical world’s status in relationship to deity, about the ultimate source of the world’s existence, about the identity of the agent that governs the world’s physical behavior, about the value of the world and its inhabitants and its component parts, and about the purpose of the world’s existence and the goal of its historical development.

A worldview provides a framework and a context in which a person deals with questions of mean-

ing and significance. In an essay entitled "On Worldviews" (*Christian Scholars Review*, Vol. XIV, No. 2, 1985, pp. 153-64) James H. Olthuis expressed it this way: "The ultimate questions of life lie deep within the heart of everyone. Who am I? Where am I going? What's it all about? Is there a god? How can I live and die happily? . . . The answers we give to these queries about the human condition may be called our worldviews or visions of life."

What makes a worldview Christian?

In this conference we are concerned with the implications of a vision of life that may be properly called a *Christian* worldview. We must ask, therefore, What makes a worldview Christian?

With little hesitation we may say that a worldview is Christian if its central focus is on the God whom we know in Christ, the triune God—Father, Son and Holy Spirit—revealed in the Scriptures as our Creator, Redeemer and Comforter.

One of the fundamental constituents of a Christian worldview is the historic Christian doctrine of creation. As revealed in the Bible, there is only one God, and he is the Creator of everything else. Every other being or thing has the status of creature within the Creation. (I capitalize the word "Creation" whenever I use it as the proper name of God's handiwork.) As the Creation, the entire universe and all of its inhabitants are completely dependent on God for their existence, for their governance, for their value and for their purpose. This doctrine of creation expresses with strength and clarity the oneness of God, the distinction between Creator and Creation, and the Creation's complete dependence on God for all things at all times.

A Christian worldview stands in bold contrast to other worldviews. Ancient Near Eastern polytheism, for example, the worldview of Israel's neighbors in Mesopotamia, Egypt and Canaan, envisioned a world filled with many gods, some of them capricious and undependable. Humankind was often seen as an afterthought, brought into being for little more than to perform the menial tasks that the lesser gods wished to avoid.

Included in the Ancient Near Eastern pantheon were those "gods" who were manifest to humankind as sun, moon, stars, seas, rivers, storms and other "powers" experienced in the course of human life. Things that the Bible presents as

creatures wholly dependent on the one and only Creator were treated as if they were gods standing as equals in the assembly of pagan deities.

A Christian worldview also stands in sharp contrast to the philosophical naturalism commonly found in the modern Western world. The fundamental tenet of naturalism is that the physical universe is all there is; there is, according to naturalism, no transcendent Deity. The universe, therefore, is envisioned as being self-existent and self-governing; a world that is not dependent on any other being or power for its existence or its governance; a world in which value and purpose (if there are such) must be found within itself. In essence, the universe is credited with possessing powers ordinarily ascribed only to deity; the universe becomes Universe, standing in place of God as a material substitute for deity.

The distinction between worldview and faith

Consistent with the approach taken by Olthuis in the previously cited essay, I find it helpful to distinguish between a Christian *worldview* and a Christian's *faith*. To have a worldview is to give assent to a set of statements. To have faith, however, is to make a personal commitment, to entrust one's self to the ultimate reality that is envisioned in a worldview. In the words of Olthuis, "For Christians, faith is an entrusting of self to God in which we receive certainty, connection, and ground for our existence, an entrusting in which we meet God in ourselves and in creation even as God meets us" (Olthuis 157).

As Christians, our faith is not in the accuracy of the set of propositions comprising our worldview; rather, our faith is in the sovereign God of whom those propositions speak. Although the particulars of a Christian worldview may be subject to much cultural variation and may change with time, the faith commitment of a Christian stands fast, and this faith in God is the one thing that all Christians hold in common. Furthermore, with this faith comes the commitment to act in love toward all other Christians, even toward those who picture God's Creation in a vocabulary of terms and concepts quite different from our own.

The distinction between worldview and world picture

Included in a worldview are concepts regarding the physical universe, with particular concern for

its ultimate identity and its relationship to God and to humanity. But at an accelerating pace, especially since the advent of modern scientific investigation, we also ask questions concerning the specific contents, properties, structure, age and temporal development of the physical universe. Should the answers to these questions also be considered as essential components of one's worldview? I think not, and I hope that the remainder of this paper will help to demonstrate why I have made this judgment.

With Professor R. Hooykaas of the University of Utrecht I find it very helpful to distinguish one's *worldview* from one's *world picture*. By "world picture" we shall mean a set of particular concepts about the contents and behavior of the physical world. A world picture, unlike a worldview, is not concerned with ultimate matters of religious import. A world picture is limited in scope to questions concerning the properties, behavior, and formative history of the physical universe and its constituent parts. To ask, for instance, if the earth revolves around the sun is a question regarding world picture; but to ask if the sun is a divine being is a worldview question.

World Pictures in the Christian Era

A diversity of world pictures has functioned in human history. The pictorial elements in these portraits of world structure have been drawn from numerous sources, and we make no pretense here of offering an adequate discussion of the complex interactions of world pictures with worldviews. Two books that I highly recommend for further study on this matter are *Religion and the Rise of Modern Science* by R. Hooykaas (Grand Rapids: Eerdmans, 1972) and *The Theologian and His Universe* by N. Max Wildiers (New York: The Seabury Press, 1982).

As might be expected, the specific content of world pictures that have functioned in Western culture during the Christian era has been influenced both by early Greek philosophy and by modern natural science. The prevailing world picture in the medieval Church, for example, bore the strong imprint of Greek thought, especially of Plato, Aristotle, and Ptolemy. Two important elements of the medieval world picture were hierarchical order and immutability. Earth, the home of humankind, was considered to be central and immovable. Surround-

ing the earth was a hierarchical system of planetary and heavenly spheres. Creatures, also, were ranked in hierarchical order from the lowest of terrestrial life-forms to humankind and up to angels, whose ranking was just below that of God himself. Speaking of this medieval world picture, Wildiers says: "...it is precisely because everything has been arranged in hierarchical order that theology can erect a ladder from earth to heaven.... Order and hierarchy were thus regarded as inseparably connected, the one evoking the other in the natural as well as the supernatural order" (Wildiers 58).

This hierarchical ordering was also considered to be perfect and therefore immune to any change in form. According to Wildiers, "There was no doubt that this order is immutable: it dates from the creation of the world and will hold good until the end of time.... Divine wisdom has once and for all clearly distinguished one thing from another, assigning everything its proper place in the whole. It is by looking at the stars that we have a foretaste of the imperishableness of God's creation and of the permanence of his world order. What is clear from such a picture is that there is no question of there being a gradual construction of order in the course of history" (Wildiers 57).

Thus, drawing heavily from the Greek concept of cosmos, medieval theology employed a world picture characterized by an ordered arrangement of celestial spheres and terrestrial creatures that was both hierarchical and unchanging. The celestial realm, including the moon and all that lay beyond it, was thought to be occupied by bodies perfect and imperishable; the terrestrial realm, on the other hand, was clearly inhabited by creatures imperfect and transitory. But in spite of these differences, the basic order and ranking was fixed. Cosmic structure in the medieval world picture was static; the idea that creatures might change in such a way as to move from one rung on the hierarchical ladder to another was unthinkable to the medieval mind.

But world pictures are not themselves permanent. Beginning in the 16th century, the work of Copernicus, Galileo, and Newton brought about revolutionary changes in the prevailing world picture. Copernicus and Galileo replaced Ptolemy's geocentric cosmological picture with a sun-centered solar system. Isaac Newton demonstrated that the celestial realm and the terrestrial realm were not substantially different from one another but functioned in

conformity to a single set of patterns. The world picture of a hierarchically differentiated cosmos was displaced by a picture of a *universe* marked by integrality and uniformity of both substance and behavior. With the waxing of modern science came the waning of hierarchical cosmologies.

Soon thereafter, another major element of the medieval world picture came under challenge: the idea of permanence, or fixity. Numerous features of the earth's surface, for instance, came to be understood as being the product of physical processes of change. The present appearance of earth's crust is now confidently judged to be the consequence of historical processes and events. Historical geology has become a mature physical science and its results must, I believe, be given due recognition by Christians as we seek to learn about earth's formative history.

The same could be said regarding astronomy and cosmology. Stars, for instance, once considered to be shining examples of constancy and changelessness, are now known to undergo remarkable change. Ordinarily this change takes place relatively slowly over billions of years, but occasionally change occurs at an explosive rate, as in a supernova.

The contemporary world picture has been formulated primarily from the results of modern experimental and observational science—a remarkably fruitful method for investigating the properties, behavior, and formative history of the physical universe. This scientifically-informed world picture envisions a universe that functions in a coherent and continuous manner. In both its day-to-day operation *and* in its historical development, the universe is now thought to have a functionally complete economy.

Expressed in the language of a Christian worldview, we might say that God's Creation is apparently characterized by an internal economy that has no gaps or deficiencies that need to be filled intrusively from outside of the creaturely realm. God has chosen, it seems, to constitute and govern the created world in such a way that the Creator need not come down and act in a creaturely manner to fill in for gaps and deficiencies in his own handiwork. (This is *not* to say, however, that as the Redeemer, God does not act in extraordinary ways as he confronts us personally and redemptively in human history.)

Constructing a World Picture Today

How does, or should, having a Christian worldview affect our efforts in the 20th century to formulate a world picture that comports well with created reality? Let me offer three contributions toward an answer to this question.

First, *having a Christian worldview will lead us to reject any world picture that is inconsistent with the Creator/creature distinction.* The world picture of medieval Christianity, although it borrowed heavily from early Greek thought, appropriately stripped the cosmos of its god-like character. As Hooykaas states, "There is a radical contrast between the deification of nature in pagan religion and, in rationalized form, in Greek philosophy, and the de-deification of nature in the Bible" (Hooykaas 7). And, speaking of that biblical perspective on the world as God's Creation, Hooykaas also notes that, "Thus, in total contradiction to pagan religion, nature is not a deity to be feared and worshipped, but a work of God to be admired, studied and managed.... The denial that God coincides with nature implies the denial that nature is god-like" (Hooykaas 9).

Second, *having a Christian worldview will lead us to reject a purely rationalistic approach to formulating a world picture.* With the early Christian church we reject the idea that the world's character or structure can be deduced by rational thought alone from any self-existent principles, ideas, or necessities. The Creator revealed in the Bible is not subject to anything outside of himself.

Third, *having a Christian worldview will lead us to respect God's freedom* in choosing the Creation's composition and structure, in establishing the patterns for his governance of its behavior, and in specifying the character and chronology of its formative history. As Christians, we believe that God creates freely and that the particulars of the Creation's structure and temporal development are the products of his unhindered choice. In principle, then, many world pictures would be compatible with a Christian worldview. To each choice available to God, there corresponds an acceptable world picture.

How then might we discover which choice God made? What better way than to look at the Creation itself? If we wish to discover the particular character of the physical universe, the empirical approach is especially suited to our goal. For exam-

ple, if we wish to learn about the manner in which the Creator directed the formation of sun, moon, and stars, of seas and dry land, then we are called, I believe, to inspect these products of his handiwork as carefully as possible. And if we wish to gain some insights into the manner in which the earth responded to the sovereign Creator's command to bring forth living creatures, then we are called, I believe, to investigate with great care the physical record of that activity.

To discover the Creator's choices, we must systematically inspect his handiwork. This is a high calling and we may not neglect it! And if some of us have neglected this empirical study and have closed our minds to the results of careful scientific investigation, then we must renew our commitment to use every opportunity to learn about the Creation as an occasion to return praise and honor to the Creator of the heavens and of the earth and of every living creature that moves on the face of the earth.

Empirical Science and the Bible

So far we have spoken in rather general terms about formulating a world picture that is consistent with a Christian worldview. Furthermore, I have argued that the concept of God's freedom to create in the manner of his own choosing leads us to recognize the need for adopting an empirical strategy for discovering how God chooses to act as Creator. But there are other important questions that need to be addressed—questions concerning the relevance of Scripture to the empirical scientific enterprise.

The first question to address is this: Does the Bible provide us with any specific principles or limitations concerning scientific *methodology*? A number of positive responses come quickly to mind: (1) We must, of course, carry out our scientific investigation in a manner that allows us to respect the object of our empirical study as being a part of God's Creation; (2) We must, of course, conduct our scientific activity in a manner marked by competence, skill and integrity. (3) We must, of course, temper our preconceptions with humility so that we will be open to discovering the character of God's handiwork.

Now, while I assume that we are agreed on these general biblical principles, there is one specific prin-

ciple that functions as the basic working assumption in contemporary natural science, but has nonetheless often been challenged as being inconsistent with biblical teaching. We generally call it the *principle of uniformity*, and we will state it here as follows: When formulating scientific theories concerning the properties, behavior or formative history of the physical universe or of its constituent parts, we assume that physical phenomena occur in the same manner at all locations in the universe and at all times in its history. Or, to state the principle more formally, we assume that the fundamental physical laws are spatially and temporally invariant. (In place of "physical laws" I would prefer, as a Christian, to say "patterns of divine governance of physical phenomena," but that is a matter of worldview, not world picture.)

Is this principle of uniformity consistent with biblical teaching? I firmly believe that, *if seen as a working assumption for scientific theory formulation*, it is. But note carefully the qualifiers. I say "working assumption," not "inviolable necessity"; and I refer to "scientific theory formulation" about physical phenomena, not the phenomena themselves. Consistent with our earlier discussion, we may not allow this principle to restrict the Creator's freedom. Nonetheless, I judge it imperative that we recognize the principle of uniformity as being the most fruitful working assumption yet devised for the systematic investigation of God's handiwork.

Does the Bible itself reveal or teach this principle? No, I don't believe that it does. To the best of my knowledge, the Bible neither demands nor prohibits the use of this principle in our scientific theorizing. Rather, the usefulness of this theoretical principle is something that had to be discovered in the course of our own study of the Creation. Even the stating of the principle of uniformity requires the employment of concepts drawn from a world picture unfamiliar to biblical writers. However, once we have seen the fruitfulness of this principle, we Christians may, I believe, interpret it as powerful evidence of the Creator's faithful governance of his Creation. And because the Creator chooses ordinarily to act in this manner, we are thereby provided with a stable and dependable environment in which to live obediently before God as the stewards of his Creation. In contrast to the gods of Ancient Near Eastern polytheism, the God

revealed in Scripture is neither capricious nor undependable.

The second question regarding the Bible's relevance to empirical science is concerned not with methodology, but with *data*. Does the Bible provide us with the kind of information regarding the physical universe that makes any part of an empirical investigation program unnecessary or irrelevant? My answer is a qualified No.

The Bible's agenda is concerned primarily with covenantal and redemptive matters, not with the data relevant to modern natural science. Furthermore, the biblical writers, though inspired by God to convey his revelation, employed a set of concepts and a vocabulary authentic to the world pictures of *their* day, not *ours*. Most of the questions relevant to modern science could be neither asked nor answered in the language available to the biblical writers. In fact, although this may challenge our own pride a bit, it may be the case that even today's scientific concepts and vocabulary may be wholly inadequate for describing the "correct" world picture. World pictures and scientific theories are necessarily limited by the conceptual resources available at any time in history, including today.

The distinction between the authoritative biblical worldview on the one hand, and the varied, culturally-limited world pictures employed by biblical writers on the other, is also maintained by Professor Hooykaas to be an important feature of the Calvinist heritage. "The Bible," says Hooykaas, "has a certain world view, that of the total dependence of the world on its Creator, but not a definite world picture" (Hooykaas 16). But there have been attempts in history, and we see them even today, to build a natural science on a foundation of what is presumed to be scientifically relevant biblical data. According to Hooykaas, however, "The idea of setting up a 'biblical' natural science found no general acceptance among the adherents of the Reformation" (116). And speaking of Reformed Christians he says: "In seeking the data of science solely in the book of *creation*, they followed the example of their main teacher, John Calvin" (117). "It is to Calvin's credit," Hooykaas continues, "that, though recognizing the discrepancy between the scientific world system of his day and the biblical text, he does not repudiate the results of scientific research on that account" (120).

World Pictures in the Christian Community Today

Within the Christian community today we find a diversity of world pictures functioning. Although they may all fall within the bounds of a Christian worldview, these world pictures differ greatly from one another. In my judgment, they differ primarily because some have held tenaciously to medieval traditions while others, to varying extents, have benefited from being informed by the results of the last three centuries of empirical science.

Recent special creationism pictures a world in which relatively little change has occurred since it was brought into being—in a form very nearly the same as at present—during a six-day period just a few thousand years ago. The movement known as "scientific creationism" seeks to warrant this picture by means of a sectarian version of scientific activity known as "creation-science." The world picture of recent special creationism is essentially the same as the static, hierarchically-structured, medieval Christian world picture.

Progressive creationism pictures a world in which God has progressively and over a multibillion-year period introduced, by extraordinary creative acts, new structures or new species of creatures into the created order. The continuous formation of non-living structures like galaxies, stars, and planets is envisioned, and a limited degree of biological variation is accepted, but macroevolution—the scenario of major changes with uninterrupted genealogical continuity—is excluded. This world picture, while it incorporates the results of natural science for its extended historical timetable, still holds to a hierarchical ordering of creatures in the sense that the major categories of life-forms are separated by ontological gaps that cannot be bridged by the processes that ordinarily take place within the created world. Progressive creationism envisions a created order that is characterized by the kind of functional incompleteness that requires God to break into the natural flow of the world's formative history to introduce new structures and creatures that would otherwise not appear.

The *evolutionary perspective* envisions a created world that is functionally complete not only in its day-to-day operation, but also in its temporal development. Evolutionary processes, like all physical processes, are interpreted as being the

manifestation of divinely governed and directed phenomena contributing to the accomplishment of God's purposes. The particulars of this world picture are drawn from the results of the professional sciences, within which a large number of Christians actively function as participants and critics. In contrast to the medieval world picture, the evolutionary picture does not entail a permanent hierarchical ordering of creatures nor does it demand a static, unchanging cosmic structure.

Back to the Original Questions

What does having a Christian worldview mean for scientific study in general? Many contributions toward an answer to this question have already been offered in the foregoing discussion on biblically-informed Christian worldviews and scientifically-informed world pictures. Let me here call attention to four fundamental points.

(1) Because we see the world as the Creation, distinct from God, *scientific study of the world is permitted.*

(2) Because we have been appointed by God to be stewards of Creation, to care for it and to employ it for the advancement of God's kingdom, *the systematic investigation of the Creation is an integral part of the human calling.* Stated even more forcefully, I believe that in the context of the 20th century it is *mandatory* that the Christian community be actively involved in the scientific enterprise.

(3) Because the particulars of the Creation's contents, structure, behavior, and formative history are contingent upon God's free choice, *our scientific investigation must be based on an empirical approach.*

(4) Because the object of scientific investigation is the physical universe alone (not all of reality), and because the sciences are competent to investigate only the empirically accessible qualities of this universe, we must recognize that *a scientifically informed world picture is an inherently incomplete portrait of reality*, an abstraction from the whole. Even if it were fully correct within its limits, it would still not constitute the full story.

But note carefully: Although we recognize that a world picture limited to what can be said on the basis of natural science is categorically incomplete (it does not deal with all possible categories of meaningful questions about the world), *we have no basis*

for demanding that the Creation itself be functionally incomplete. The Creation may well have a functionally complete economy both for its daily operation and for its development in time. If it does, then a "principle of functional integrity" would constitute a fruitful working assumption for scientific investigation.

What does having a Christian worldview mean concerning the way we should evaluate the creation-evolution debate? Employing the vocabulary and concepts developed in this paper, let me make four recommendations.

(1) *We must distinguish creation theology from creation pictures;* that is, we must recognize the substantial difference between the theological concept of creation, one of the principal elements of a Christian worldview, and the several world pictures that have been employed by Christians to visualize the Creator's work in forming his Creation and his creatures.

(2) *We must distinguish evolution from evolutionism;* that is, we must recognize the substantial difference between a scientifically-informed, evolutionary world picture and the worldview of evolutionary naturalism. For instance, where an evolutionary world picture is limited to descriptions of the physical behavior of matter and material systems, the worldview of evolutionary naturalism proceeds to ascribe the governance of that behavior to matter itself. Similarly, where an evolutionary world picture is limited to descriptions of the processes and events that comprise the formative history of the physical universe, the worldview of evolutionary naturalism goes on to assert that the ultimate origin of the world's existence is self-explanatory. Where a Christian worldview envisions a God-governed universe that is at all times dependent on the Creator for its existence, the worldview of naturalism envisions a self-governed and self-existent world devoid of any transcendent power or being.

(3) *We must cease employing the warfare metaphor;* that is, we must stop using the militant language of battle and debate when discussing the relationship of the Christian faith and worldview to the enterprise of formulating a scientifically adequate world picture. To speak as if one must choose between a creation-based worldview and a scientifically-informed, evolutionary world picture is to promote a mischievous fallacy. This militant

and fallacious either-or strategy has the effect of driving a wedge between Christianity and the scientific enterprise. We who stand in the Reformed heritage should have nothing to do with such a misguided endeavor.

(4) Finally, *we must recognize the evolutionary world picture as one among many world pictures that are compatible with a Christian worldview.* The merits of this picture must be evaluated on empirical criteria, *not* on theological or exegetical grounds. And when the proponents of naturalism assert that

an evolutionary world picture contradicts or discredits a Christian worldview, then we must vigorously and thoughtfully expose the fallacy of that specious declaration.

Each of these recommendations is, I believe, important not only for the sake of maintaining peace within the Christian church, but also for the sake of presenting an effective Christian witness to a scientifically knowledgeable world—the world in which we and our children live. May God bless our efforts as together we seek to present this witness.