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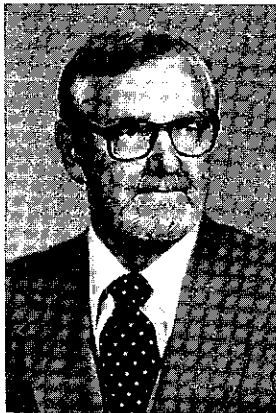
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The Foundations of Science

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Sometimes scientific studies are contrasted with our everyday way of thinking. The latter, presumably, is not scientific because it is not theoretic thought. Actually, most generalizations are of the nature of theories as they make claims concerning things and events which are not entirely in our control. Scientific theorizing usually proceeds in a somewhat more disciplined

fashion than everyday thinking and can usually call in more precise controls in the process of experimentation.

A theory of theories for science should relate it to the most basic and the most reliable knowledge that we have of the created order. The scientist is usually interested, too, in arriving at some laws which give him access to some ordered

behavior or ordered sequences in data with which he is involved. In fact, we differentiate the exact sciences from the other disciplines of study that covet that name, because the exact sciences allow for comparatively precise prediction and that in turn has great utility in getting man's work done.

The ancient Greeks began a self-conscious examination of the world in the early sixth century B.C. For them, the basic reality was matter itself. But presently they looked for a nonmaterial principle of order, and then they suggested the universe was ordered by *Nous*, that is, mind, or by a *Logos*, an ordering word. Plato had a *demiurge* that arranged matter according to the pattern of his eternal Ideas, which for him were the most basic reality. The Stoics found *spermata rationis*, the seeds of reason, as an ordering principle in the natural realm. They originated the idea of natural law, which later also took on political implications. But among all the Greeks there was no completely transcendent principle of being to which order and origins were related. The clear enunciation of a transcendent Creator as the origin and source of order for creation was a distinctive Biblical principle, a principle available only as the Creator chose to reveal it.

Early in the Christian era, the Patristics, Christian converts with a Greek background, began to note a similarity between the Greek logos and the Logos of John 1:1. Their subsequent attempt at a syncretism between Christian and Greek thought was also a basis for a natural theology which began theorizing concerning God by way of nature through reason. St. Anselm presumed to prove the existence of God through the self-evidence of reason alone. Thomas Aquinas concocted his five proofs for the existence of God from his observations complemented by speculative metaphysics on the order of Aristotle.

To elaborate on Aquinas: from the presence of movement a Prime Mover was deduced. This prime Mover is God. Causality leads to a First Cause. Dependent being

implies Necessary Being. Design is evidence of a Designer. Comparative good must have as its unrealized model the Perfect Good. These conclusions, in total, presumably give us incontrovertible evidence for the existence of God. But, strictly speaking, creational causality as a causal series stops at the borders of creation, as it were. And as Blaise Pascal, the seventeenth-century mathematician pointed out, the Thomistic proofs yield only an abstract principle, not the God of Abraham, Isaac, and Jacob, the God revealed in the Bible.

Most Christians agree that the Bible does not presume to be scientific. That is not to say that statements which it makes concerning the natural order are incorrect. At times Christians were misled into taking figurative language literally, as did the Medieval Church with respect to astronomical data. They made the further mistake of demanding that their misconceptions be incorporated into the essential beliefs of the Christian faith.

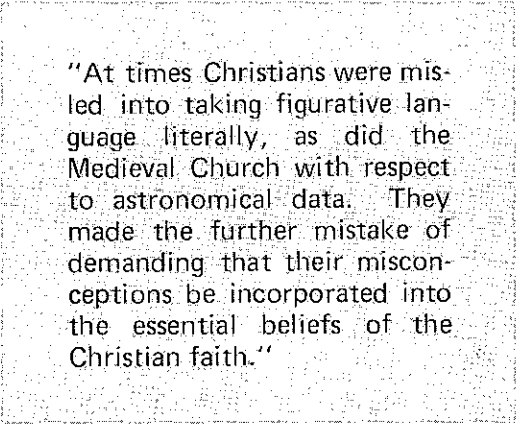
Christians, generally, have concluded from the frequent references in the Psalms, Job, and other Scriptures that creation is under divinely ordained laws. Some Christians have asserted that science is then possible because a God-ordained creational order will not change under their hand, as it were, while they are positing the laws associated with the various sciences. Practically, the idea of law was enunciated in the promise that God gave to Noah when Noah was making his exit from the ark (Genesis 8:22).

What some Christians are then saying, in effect, is that the laws of causality operate in a dependable way. Laws are dependable because behind them stands the Sovereign Creator, the God of the Bible. This dependability can be maintained despite the fact that, after Heisenberg, in quantum mechanics it is impossible to state accurately the momentum and position of a particle at a given instant. The bulk properties of matter are still sufficiently predictable to allow successful moonshots.

In the eighteenth century, the British skeptical philosopher David Hume took the

idea of causality out of the events of nature and made it a mental construct. Things do not have causality; we think of them in a causal way. This remarkable conclusion startled the German philosopher Immanuel Kant out of what he referred to as his "Dogmatic slumbers." Kant had assumed that the old rationalistic approaches to knowledge gave certainty. Now he realized that the whole problem had to be rethought. This he set out to do.

Kant accepted Hume's conclusion that there is no certainty to be found at the foundation of things as such. One must, in fact, remain skeptical as to the nature of "das Ding an sich," the thing in itself. It must remain virtually unknowable. How then can one go about the business of science, that is, knowing and ordering things? Kant concluded that the solution could be found in the ordering abilities of man himself. We experience all things in the context of time and space because we experience time and space intuitively. We



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also structure experience by our thought patterns. We use such categories as quantity and quality which our mind imposes on the unordered flux of things. This does not yield certainty, but why worry about that when in a practical way it gets our work done for us. So we structure the world of the phenomena, the world of science, for ourselves. Man constitutes the order of creation for himself, and science recovers

from the blow dealt it by David Hume.

The phenomena are only half of Kant's world, however. There is also a noumenal world, the world of aesthetics, ethics, and religion. In the noumenal world, the categories of science do not apply. One can make no propositional, that is, declarative statements about noumenal concerns. Such concerns are those of value and not of fact. We use assertional language with reference to phenomena. We use hortatory language with reference to the noumenal world.

The basic fact-vs.-value dichotomy which was nascent in Kant's thought was juxtaposed with a vengeance by the Logical Positivists. They argued that only factual statements could be tested for truth value because only factual statements can be verified by sense experience. The Positivists had made sense experience, directly or indirectly, the test of truth. Some went so far as to conclude that because any statement about God could only be a non-sense statement, therefore, it must also be nonsense.

As you might guess, the distinction demanded by the Positivists greatly complicated the problem of religious language. How does one talk about God? Many reached the conclusion that all "God talk" had to be considered a form of rhetorical expression that communicates through metaphors and similes. Literal and declarative sentences are reserved for matters of science and the practical methods by which we manipulate the world of phenomena.

Christians of various confessions through the centuries have taken a variety of positions as to the Biblical foundations of science. Because Christians cannot avoid the conclusion that knowledge, and, therefore, science must have a transcendent foundation, the most basic question is that of how we relate to a transcendent God as our source of knowledge. I already referred to the syncretism of the Patristics and the natural theology of the Thomists.

A dominant influence in American Protestantism was the apologetic stance of Princeton Seminary. It took the approach that the existence of God and, therefore,

also the beginnings of knowledge could be affirmed by reference to the cosmological arguments. These are essentially the Five Ways of Thomas Aquinas. It can be alleged, then, that Princeton never got beyond what was essentially Thomism in its apologetic approach.

When Cornelius Van Til was appointed to the chair of ethics and apologetics as a member of the original Westminster Seminary faculty almost fifty years ago, he chose to align himself with Augustine and Calvin. This meant taking a position of presuppositionalism and preconditionalism. One must presuppose the existence of God and His provident rule as the basis for all knowledge, and one cannot know in the context of total reality without the preconditioning influence of his Christian faith. Calvin had said that we need the faith-appropriated spectacles of the Bible in order to see anything aright in the realm of creation. That insight had clear implications for one's theory of knowledge as well as for the pursuit of science.

One would suppose that in any dialogue about a Thomistic apologetic as contrasted with that of Calvin, those in the Reformed community would want to side with Calvin. Not so. In the late 1930's and at various times since then, there has been general opposition to the Calvinistic approach. When Cornelius Van Til proposed the Calvinistic idea that there were no "brute" facts, that all facts stood in the context of God's preinterpretation, many of the faculty of Calvin College opposed that point of view. Henry Stob, following his mentor, W. Harry Jellema, chose the way of Aquinas. He admitted such categories into his own ontology as "being in general," thus clearly indicating that he was choosing a basic Thomism.

When Van Til gave some guest lectures at Calvin Seminary in the early 1950's the senior philosophy majors were unsettled by Van Til's Biblical authoritarianism. They were persuaded that they were going to battle the foes of a Christian position with the rationalistic weapons bequeathed them by Aquinas. They were unable to

acknowledge that only the Word of the Lord is sharp as a two-edged sword, penetrating both the bones and the marrow. So also the *Calvin Forum* under the editorship of Cecil De Boer, enlisting help wherever it would be found, launched a journalistic campaign against the Westminster Apologetic.¹ It was the Westminster Apologetic which the *Forum* was protesting even as it went into its death throes and ceased publication.

Concurrent with the development of the Westminster Apologetic, Herman Dooyeweerd, Professor of Jurisprudence at the Free University of Amsterdam, was busy with developments of his own. Even more specifically than Van Til, Dooyeweerd addressed himself to the problem of the foundations of theorizing. He concluded that all Christian thinking must be done in the context of the dynamic of God's covenant, which is founded in the context of history as it deals with creation, the fall, and redemption.

In part, perhaps, because of his legal background, but more because of the Biblical witness to law in creation, Dooyeweerd chose creation law as the bottom line of reference for scientific theorizing and the development of science. So it was also that he chose to call his system of thought the philosophy of the idea of law, *Wijsbegeerte der Wetsidee*. The English version is Cosmomic Philosophy, the philosophy of cosmic law.²

Though many differed as to the extent of their acceptance of Dooyeweerd as to detail, those who chose Calvin's approach over that of Aquinas immediately showed enthusiasm for Dooyeweerd's prodigious labors in trying to branch out in philosophy on the basis of Calvin's rootage. As is often the case with followers, some of Dooyeweerd's disciples in expressions of over-enthusiasm tried to canonize Dooyeweerd and also tended to ossify his system.

Dooyeweerd classified all philosophies which did not recognize the God of the Bible as the transcendent source of being and knowing as "immanence philosophies."

He bore down with particular vigor on the thought of David Hume and Immanuel Kant. He rejected their "Archimedian Point," their starting point, as radically at odds with a philosophy that recognizes the God of the Bible as its "ἀρχή," its origin. So it is that Dooyeweerd disagrees with Hume and all his empiricist followers as to the foundations of science. In contrast to Hume's probability world where chance is ultimate, Dooyeweerd posited creation law as a base for science, law which is upheld or imposed by a provident Creator.

In 1964, on the occasion of his emeritation from the philosophy department of Calvin College, several of W. Harry Jellema's protégés contributed to a "festschrift" in his honor. Nicholas Wolterstorff contributed the lead article under the title "Faith and Philosophy." That also became the title of the book, though somewhat of a misnomer as only Wolterstorff's article was specifically concerned with the title subject.

In that 1964 article, Wolterstorff took a position from which he could conclude that "in principle at least it seems possible for a man's philosophical perspective and and his way of life to be independent—for his philosophical appeal to be independent of his ultimate trust."³ What Wolterstorff was saying in effect assumes that the Christian theorist does not need a Biblical base for his theorizing.

More recently, Wolterstorff has brought the subject of the foundations of science under more specific and detailed discussion in his 1976 publication, *Reason Within the Bounds of Religion*.⁴ In this work, Wolterstorff touches on many of the issues that relate to the problem of a Christian foundation for scientific studies. It will not be necessary to review the work in detail, as in this article I am concerned with the basic problem of how in our theorizing we relate to the revelation of a transcendent God. That problem is both simplified and complicated by the "preconditionality" of Augustine and Calvin: the position that knowing the Creator is a precondition to knowing in the creation.⁵

Or more specifically, this position asserts that knowing related to the data of science can only be a kind of "pro tempore" knowing when it is cut loose from creation-al foundations.

Since medieval times, scholars who addressed the subject have thought of communication with and from God as having basically three possibilities. The words and meaning from God and those of men could have a univocal relationship. They would mean precisely the same related to the being of God and the being of men. The early Greeks took this approach too. With no conception of the Scriptural teaching of creation out of nothing, they thought the rationality of man to be essentially the same as the rationality of God. In such a common context, all human and divine categories would be the same.⁶

In the medieval period, some scholars were so deeply impressed with the otherness of God that they would apply no categories commonly to God and man. In the use of human categories, one could say only what God is not. One could use only a *via negativa*, the way of negation. In our century, appropriating that idea, Karl Barth made God the "Wholly Other." The Bible does seem quite clear in positing a discontinuity between Creator and creature. But if there is no analogy between divine and human categories we are doomed to silence and, with Wittgenstein, we would have to say that concerning that which we know nothing we can say nothing.

Dooyeweerd was so impressed with the Creator-creature discontinuity that he spoke of God as *Being* and of creation as *Meaning*. This terminology tends towards semantic confusion (as do other Dooyeweerdian designations). For the same reason, however, Dooyeweerd himself eschews some generally used terms such as *rationality* as applicable to the thoughts or ways of God.

The Bible seems to allow a third way as to the possibilities of divine-human communication. We find that way expres-

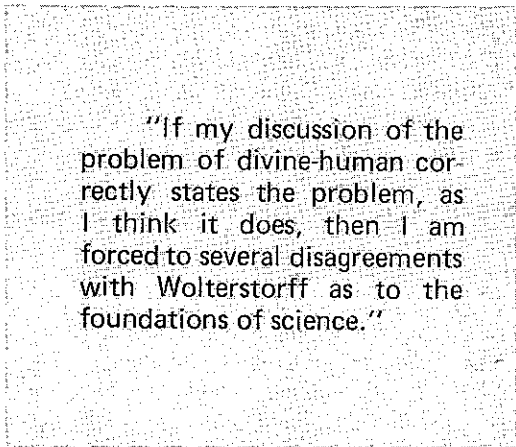
sed in such passages as Psalm 103:13, where we read, "As a father pities his children so the Lord pities them that fear Him." This is the way of analogy. The Psalmist does not assert that the pity of God and the pity of human fathers are univocally identical, but that they are similar in an analogous way.

If my discussion of the problem of divine-human correctly states the problem, as I think it does, then I am forced to several disagreements with Wolterstorff as to the foundations of science. Early in his discussion, Wolterstorff disqualifies the use of analogy in relating to the foundations of science. The use of simile and metaphor are not permissible. He says, "Yet though I have learned from proposals of other Christians along these lines all such theories as I am acquainted with seem to me either to misconstrue the nature of theoretic inquiry or (most commonly) at crucial junctures to substitute rhetoric and metaphor for the close analysis that is required."⁷

The crucial juncture where Wolterstorff demands careful analysis is that at which we must bridge the gap between Creator and creature. It is the juncture where analysis can only fail because the gap cannot be bridged univocally. By Wolterstorff's own admission, "Many theories which seem warranted are not deducible from any foundation." So, then, in whatever way we choose to solve the *foundation* problem, we cannot expect to relate our theorizing to our foundation in an unbroken line of inductive or deductive steps.

Wolterstorff defines "foundationalism" as the belief that a science can be "firmly based on a foundation of certitudes which can be known noninferentially."⁸ This means that these certitudes would have to be innately self-evident or they would have to be direct revelations without inductive or deductive mediation. In sequel, Wolterstorff disqualifies what by his definition is *foundationalism* because it cannot furnish indubitable propositions as the foundation of science.

The anomaly in Wolterstorff's treatment of foundationalism with respect to indubitability lies in the fact that after having disqualified the empirical-rational method as a way to foundations, he disqualifies Biblical foundationalism by that very method. Thus, the Bible cannot claim a canonicity which would make its foundations unique and indubitable. We are invited to "notice that it does the foundationalist no good to fall back on the argument that the original autograph of the



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Scripture contained exactly what God revealed, for the autograph is no longer available."⁹

What is implied in Wolterstorff's argument is that the chain of empirical investigation is broken by the loss of the autograph. Now there is no longer a reliable causal connection between what we read as our Bibles and the God-breathed Word to the writers of the autographs. Not only does Wolterstorff subject the Scriptures to empirical canons, but he makes a distinction between "the testimony of the Holy Spirit" and indubitable knowledge. I don't know what else he could have in mind when he says, "Not all of what belongs to the belief-content of one's authentic commitment may be true. Some of what God wishes us to believe may be fit and proper for us his 'children' to believe, yet strictly speaking false."¹⁰ This

means, I presume, that what we believe is not, strictly speaking, indubitable by empirical-rational canons.

In lieu of a Biblical foundationalism, which he has disqualified, Wolterstorff wants to make use of "control beliefs" which he subscribes to as a "Christ Follower." Control beliefs are one of a variety of kinds of beliefs. There are also data beliefs and data-background beliefs which we use in our scientific work. Data beliefs are directly concerned with scientific data as such. Data-background beliefs are furnished by the general cultural context of one's life. Some beliefs associated with one's religion fall into that category. Control beliefs, than, I should think, would be limited to the basic beliefs from which the Christian derives his religious commitment.

At this point I think Wolterstorff creates confusion when he says, "Rare will be the Christian scholar all of whose control beliefs are contained within his actual Christian commitment. This is justifiably the case. The reasons why a medical researcher rejects the theory lying behind the Chinese practice of acupuncture as not even the sort of theory he will entertain will most likely have little if anything to do with his religion."¹¹

I would say that a belief that is not religiously significant in a most basic way must be a belief which should have no more than data-background status. So it was that the Congregation of the Index made a category mistake with respect to the astronomical findings of Copernicus. It made a data-background belief the test of one's Christian faith.

If the crucial juncture in arriving at one's control beliefs is concerned with the way we receive those beliefs from our transcendent God, then Wolterstorff's approach is vulnerable to the criticism which was leveled by Lester De Koster in a *Banner* book review.¹² Maybe the individualism that De Koster alleges for Wolterstorff's way to revelation is short of being "sovereign and absolute" (De Koster's designation), but neither does it resemble anything that one might conceivably call

Calvinism. To call attention to the fact, as Alvin Plantinga does,¹³ that we express our personal beliefs every Sunday in the Apostle's Creed cannot rescue Wolterstorff from the subjectivism and individualism which are at the root of his approach to revelation. In the Creed we also confess to the communion of the saints in the context of the church, which mitigates the individualism of our beliefs by a common ground.

Wolterstorff does not want to acknowledge any common ground. In fact, he alleges that we have none, "confronted as we are with the fact that we lack a shared foundation, each of us has no choice, but 'to one's self be true.'"¹⁴ In this quotation from Polonius (an ironic persona of Shakespeare, incidentally), Wolterstorff is not dealing with what Ralph Barton Perry has discussed at some length as our "ego-centric predicament." He is referring to the idea that our control beliefs are highly personal and must be denied the certitude which adheres to propositions reached by some objective method.

In view of Wolterstorff's forthright repudiation of Calvin's preconditionalism and presuppositionalism, it seems inconsistent of Plantinga to make an emotional plea for the Calvinism of this Wolterstorff writing. Distinguished as he is in the field of logic, it seems strange that Plantinga should use a variation on the *argumentum ad hominem* to attempt to establish credentials for Wolterstorff. What he is saying, in effect, is that because Wolterstorff has contributed many writings of a Calvinistic character to the Reformed community, therefore, this writing is also Calvinistic. Scholarship would be served better if Plantinga corroborated the claim by citing from the present work.

Wolterstorff has advanced beyond his 1964 writing. There, he was willing to admit a Thomistic nature/grace dichotomy into the Christian scholar's thought. In this 1976 book, he demands more consistency, and he also seeks a greater internalizing of one's beliefs as they affect one's activity as a scholar. Yet there is a kind of residual Thomism because control

beliefs seem to act mostly as parameters for one's theorizing rather than acting as the springboard for all activity, theorizing included.

All those working in the sciences use the empirical-rational method in their work. But Wolterstorff shows positivistic tendencies when he tests the indubitability of the Bible by the canons of the empirical-rational method. His demand that the way to or from foundations should be free from the use of rhetoric and metaphor seems to bow to the demands of the language-analysis philosophers. And it should be obvious, having eliminated other routes, Wolterstorff's way to a Transcendent God has to be the way of Kierkegaardian existentialism, a highly subjective leap of faith.

In sum then, Wolterstorff's reworking of the problem yields a conglomerate which may lend itself to various characterizations and labels. However, Calvinism is not one of them. It may be, too, that Wolterstorff has advanced beyond any previously held position, and it is time that we move forward with him. The careful reader will have to make a judgment about that.

George I. Mavrodes, professor of philosophy at the University of Michigan and an evangelical scholar, suggests that Christians may find Wolterstorff's rejection of Biblical foundationalism quite "unsettling."¹⁵ In a *Christianity Today* book review, Mavrodes goes on to suggest that we should "select some proposition that it is thought we can know on a biblical basis, and state it clearly. Then formulate and state the full set of the things that must be true if the proposition is to be derivable from the Bible in the desired way."¹⁶

I think that Dooyeweerd spent many years doing just the kind of thing that Mavrodes suggests. Wolterstorff passes over Dooyeweerd's effort with only a single-sentence reference, mostly, I suppose, because Wolterstorff's method is highly individualistic in its foundation and in its results. These results, however, though

raising important questions, have yielded no satisfactory answers. Some would like to amend or revise on the basis of Dooyeweerd's beginnings. If that effort proves unsatisfactory, then I presume it is indeed "back to the drawing boards." In any case, I believe that from the start we do well to listen to John Calvin again.¹⁷

Footnotes

1. For a brief, lucid exposition of the Westminster Apologetic see Jim Halsey, *For Such A Time As This: An Introduction to the Reformed Apologetics of Cornelius Van Til*, Presbyterian and Reformed Publishing Co., Nutley, New Jersey, 1976.

2. L. Kalsbeek, *Contours of a Christian Philosophy: An introduction to Herman Dooyeweerd's Thought*, Wedge Publishing Foundation, Toronto, 1975.

3. Nicholas Wolterstorff, "Faith and Philosophy" in *Faith And Philosophy*, Alvin Plantinga, ed., Wm. B. Eerdmans Pub. Co., Grand Rapids, 1964, p. 32.

4. Nicholas Wolterstorff, *Reason Within the Bounds of Religion*, Wm. B. Eerdmans Pub. Co., Grand Rapids, 1976.

5. *Ibid.*, p. 27.

6. See Halsey, *op. cit.*, Chapter II

7. N. Wolterstorff, *Ibid.*, p. 18.

8. *Ibid.*, p. 25.

9. *Ibid.*, p. 56.

10. *Ibid.*, p. 95.

11. *Ibid.*, p. 78.

12. Lester De Koster, *The Banner*, April 29, 1977, p. 24.

13. N. Wolterstorff, *Ibid.*, p. 62.

14. Alvin Plantinga in "Voices," *The Banner*, June 24, 1977, p. 2.

15. George I. Mavrodes, *Christianity Today*, January 21, 1977, p. 32.

16. *Ibid.*

17. For an extensive discussion of theorizing as treated by secular philosophers, I refer professional philosophers and scientists to the volume *Can Theories Be Refuted*, Sandra G. Harding, ed., D. Ridel Pub. Co., Dordrecht, Holland, 1976. This is an anthology with contributors such as Karl R. Popper, Willard Van Orman Quine, Carl G. Hempel, and Imre Lakatos.