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Antithesis in Biology

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In Psalm 19, we read that "the heavens declare the glory of God and the firmament proclaims his handiwork." This passage, along with others, such as Romans 1, point out that the created order testifies clearly to God's creating and upholding power. In my college days, before I became more than a nominal Christian, I used to believe just the opposite, i.e., that God had so cleverly disguised Himself in Nature that one could easily see only natural law and miss seeing God altogether. With my "pick and choose" attitude toward Scripture, I even imagined that Jesus' refusal to jump from the temple and His frequent admonitions to healed persons to tell no one of His power were further evidence of God's desire for disguise—or of His desire that people should come to Him in spite of the fact that the world appeared to run just as well without Him. Scripture's own teaching, however, is quite the contrary, namely that the created order testifies so clearly to God's eternal power and deity that men (in their unbelief) must suppress the truth concerning His existence, and are without excuse before Him.

Such a doctrine ought to make an enormous difference in our science. Natural science, generally speaking, is the continuing search to discover and to express patterns of order and relationship in nature, and biology is the search for order within and among living things.

All scientists believe that nature is orderly. There are two kinds of order, internally determined order and externally determined order. The structure of ice, for example, is internally determined, since even the most intricate and highly "designed" snowflake is a result of the hydrogen bonding properties of water molecules, i.e., the result of molecules doing what comes naturally for them under certain conditions. The structure of the faces on Mt. Rushmore, however, is externally determined, because it is the result of sculptors "imposing their will" upon the rock surface without special regard for the patterns that weathering and erosion would naturally produce on those rocks.

For most people, only the first kind of order, the internally determined, is possible in nature apart from man's influence, since for most people there is nothing external to nature that could order matter after its own will in some distinctive manner. Christians, however, ought not to make such a mistake. We know that God transcends nature, and we should know from Scripture that God intends to reveal (not conceal, as I once thought) His presence in the things that have been made. As Christians, then, we have reason to expect examples of externally determined order in nature, examples as clearly testifying to God's creative power as the faces on Mt. Rushmore testify of man's creative skills.

There are, of course, also examples of

internally determined order in nature, and these reflect God's sustaining or providential presence, i.e., His use of the "natural" properties with which He endowed matter and living things. For example, God enables His living creatures to multiply after their kinds. Given the structure of living systems, reproduction "naturally" follows, and the technical description of the reproductive process by Christian vs. non-Christian scientists will differ little. The Christian will acknowledge God as directing the reproductive process in a marvelous way, but the non-Christian will tend to ignore God entirely or identify Him with natural law in some deistic or pantheistic manner.

Some ordered systems in nature, however, cannot be mistaken for the products of natural process. They are clearly not determined by, nor reducible to, the properties of the parts of the system, as natural scientists presently understand them. Such systems may be called "artistic," since their patterns of order imply the work of an "artist." An artist, for example, can arrange colored stones in mosaic patterns which could not be produced by natural interactions among the stones themselves; similarly, the gene sets of living organisms seem to be arranged in "mosaic" patterns that natural interactions among the genes could not produce. Such a pattern of order in nature might be called a "created pattern," because its externally determined order so clearly implies the work of the Creator.

The antithesis in biology, then, concerns even the structure of natural reality itself. For the secular scientist, all higher levels of order are derived from, and ultimately reducible to, physico-chemical interactions. For the Christian, several levels and kinds of order are possible, and systems at each level have distinctive patterns of order derived not from the properties of the parts of a system, but only from a plan in the mind of its Creator.

It is completely impossible for the secular scientist to recognize patterns of relationships, as being created, since his wholehearted faith commitment absolutely forbids him to recognize anything outside nature itself. He sees the data implying created order, of course, but invariably he refers to such data as "remarkable," "enigmatic," "paradoxical," or "anomalous," and often states—quite consistently in terms of his presuppositions—his belief that future research will undoubtedly show how such data can be interpreted in purely naturalistic, physico-chemical terms. Although the Christian scientist must certainly work with the many internally determined systems of order in nature, he can make truly unique contributions to his field by uncovering and articulating those created patterns of relationships which his secular colleague is not looking for and could never recognize. Discovering and expressing such created patterns of order would serve not only to glorify God but also to provide a better framework for scientific prediction and integration, since the elements of God's world really cohere only in Christ.

Let us now examine three areas in biology where the data suggest created patterns of relationships, one example each from the molecular, organismic, and ecological levels of organization.

The relentless probing of scientists into the workings of living cells has yielded, mostly in the last two decades, an awesome treasure of knowledge about the molecular organization of living systems. It is now clear that all life on earth is based on a working relationship between DNA and protein molecules. DNA is the vaunted molecule of heredity which encodes genetic information and transfers it from one generation to the next, while proteins are the molecules serving in diverse capacities as enzymes, hormones, muscle fibers, structural elements, etc., to produce the traits encoded in DNA. Some viruses, the

develop naturally from the properties of simplest forms of life, consist of only the DNA and protein molecules.

What about this fundamental DNA-protein relationship? Is the pattern of relationship between these two molecules internally determined, a pattern that would the molecules as they interact over time? Or do we have here a created relationship, and externally determined system of order in which DNA and protein molecules are constrained to interact with properties derived from the system itself, rather than from (and even in spite of) the chemical properties of the molecules themselves? There are still many things about the DNA-protein relationship which we do not know, but the abundance of things which we do know suggests emphatically that we are dealing here with created order.

In the "translation" process by which DNA makes protein, a series of DNA bases are used to line up a series of protein amino acids. There are a variety of base-acid and other chemical relationships between DNA and proteins, but none of these natural reactions between DNA and protein ever occurs, except after death. The intricate activating enzymes that "impose" a truly logical, even "grammatical" relationship between DNA base triplets and highly variable amino acid R groups take advantage of not a single distinctive chemical relationship between the molecules involved. And it has been established that activating enzymes themselves cannot be produced by spontaneous chemical processes; and, further, that even if they could be so produced, they would be detrimental to life apart from a context of strict energy control and balance. (For additional fascinating details, ask our Biology 101 students.)

In short, the relationship between DNA and protein in living systems is somewhat like the relationship of parts in a television set. No laws of physics and chemistry are violated in the operation of a television set, but these laws and the properties of the metal, glass, etc. in the set are insufficient to account for its origin. The ordering of the parts in the TV set is clearly externally determined or "created," and it should be just as clear, upon examination, that the ordering of parts in living systems is externally determined or created.

When I offered this argument once in graduate school seminar, my molecular biology professor responded that we believe television sets are created because we can see the manufacturers and the repairmen—implying that her disbelief in the creation model of life's order was not due to dispute with the data but to her disbelief in the existence of a "Manufacturer" or "Repairman" outside the natural order. Even Christians are accustomed to contrasting "natural" with "man-made" or artificial objects. I am suggesting, however, that certain kinds of order and relationship in nature bear the stamp of "God-made" as clearly as some of our artifacts proclaim "man-made."

Data on the diversity of organisms inhabiting our planet suggest further that God made many kinds of life that were different from each other right from the beginning. Although we cannot equate "species" with "kind," since both are ambiguous terms, it seems clear from Scripture that much organic diversity is primary, and that taxonomic patterns of relationship are artistic or thematic expressions of the Creator's will. On the other hand, secular scientists in the past 150 years have largely come to believe that all diversity is secondary, and that patterns of relationship follow branching genetic lines of descent with modification.

Increasing knowledge has made the position of the secular scientist more and more untenable. Studies of protein, for example, were supposed to reveal lines of descent more clearly than subjectively evaluated traits, but that expectation has been

frustrated. Hemoglobin, the oxygen-carrying pigment in red blood cells, occurs not only in man and other vertebrates, but also in some segmented worms and even bacteria. As secular scientists admit, we know too much about hemoglobin to believe it arose independently in such different stocks, and our knowledge of natural selection suggests that it should not have been lost from so many intermediate forms if it arose only once long ago.

Lack of intermediate forms in the fossil record, which was considered by Charles Darwin over 150 years ago as the "most serious objection which can be urged against the theory" he was proposing, is a problem even more acute today than in Darwin's time. Those characteristics which are found in both living and fossil forms (including even such proposed missing links as Archaeopteryx) are generally distributed in mosaic patterns and not in the branching-lines-of-descent patterns anticipated by the secular scientists. It may even be possible one day soon to develop a "Christian taxonomy" based upon the assumption that God made different organisms as unique combinations of elements from a finite and identifiable collection of gene sets, much as the vast numbers of diverse molecules are formed as unique combinations of a few atomic elements. Such a "Christian taxonomy" might prove as predictive and scientifically valuable as the classification scheme for the atomic elements.

On the ecological level, the most obvious difference between Christian and secular scientists involves the relationship of man to the rest of nature. Several leading secular scientists regard man's Biblical mandate to "have dominion" as the root cause of all our ecological woes. Indeed, secularists are inclined to deify "nature" and the "natural" and, somewhat paradoxically, to regard man as an intruder into and perverter of the natural order. These same people, however, do not hesitate to block entrophication, the natural process that fills up most lakes with "muck," nor to put out forest and grass fires, both natural parts of several ecosystems, nor do they try to check blights and plagues that have played a large role in natural selection.

The Christian, although often regrettably lacking in understanding and practice, should recognize from the Biblical mandate that his task is to "dress and keep" the earth. Since the Curse, his mandate also includes a healing aspect. Because of the Curse, occasioned by his sin, man cannot now equate "natural" with "good" nor accept natural law as normative; instead, he must work to set aright those aspects of the created order now set askew. In short, man cannot shirk his duty toward the rest of the created order, and he cannot be content merely to "let nature take its course." God united the earth, the plants, the animals, and man into a single interdependent system, each with a distinctive role. If man plays his role properly, nature should not be worse off, but better.

Now what does all this mean for us here at Dordt College? In one area, it means that you students have the right to demand several things of us as teachers. First, you may demand that we teachers re-study our science. I have been contrasting Christian with secular scientists, but in reality there are many Christians who are secular scientists, that is, Christian scientists whose beliefs about God and whose concepts of the created order have no particular effect on their science. Often, Christians have simply taken currently acceptable scientific theories and tried to re-interpret them or to harmonize them with Christian beliefs. We are tempted to think that the "created order" is simply the "natural order" with God behind it, and we fail to anticipate or to find those patterns of relationship and kinds of order that are possible only in a distinctively created

system.

In this connection, I must admit that the synod report on "The Nature and Extent of Biblical Authority" worries me a bit. This report says that when science and Scripture appear to disagree, we must re-interpret either the science or the Scripture. Now who would disagree with that? But the problem is not so much in theory as in practice. When science and Scripture appear to conflict, it always seems so much easier to re-interpret the Scripture than the science, especially in these days when many scholars argue about the meaning of language in general and the meaning of the Scriptures as intended or understood by "pre-scientific" Jews and first-century Christians. In short, with the latitude of Scriptural interpretation currently tolerated, it takes far less effort for a scientist to speculate on the re-interpretation of Scripture than it takes for him to engage in the years of painstaking research required to re-interpret science. In practice, then, which is going to be re-interpreted more often?

You students should demand of us, in the second place, that we continually study the Scriptures, especially in relation to our science. Not, of course, in the sense that the Bible is a "textbook of science." God forbid. Have you read one of your textbooks lately? Or try reading one of your parents' textbooks, especially one on science. Twenty years makes one obsolete. Sometime a decade—or less. Nothing could be more derogatory than calling the Scriptures a textbook. Even myths have a more enduring character. The point I'm trying to make here is that textbooks, especially in natural science, deal with tentative and changeable theories and even with changes in what are regarded as "facts." Let me give you a personal example. In 1966 I wrote a programmed textbook on DNA. Last year the publisher asked me to prepare a revision. After looking through it, I simply laid aside the first edition and started writing the second edition from scratch. That's how much our knowledge of DNA had grown in seven years. What we knew in 1966 was not all wrong, but it was so incomplete (and some was wrong) that some ideas and philosophic speculations based on the 1966 model would not be compatible with our present knowledge. Although science can certainly enrich our understanding of Scripture and correct some of our peripheral misconceptions about it, trying to use the tentative and tenuous conclusions of theoretic science to re-interpret the eternal truths of Scripture would be like trying to count the scales on a wriggling snake to check the accuracy of a meter stick. It is not science's certainty that merits admiration, but its humble admission of uncertainty and its ever-continuing efforts at self-correction.

Furthermore, we must be more than careful if we try to set ourselves up as judges over what God's Word is permitted to say to us. Eve, for example, knew God's Word concerning a certain fruit tree very well, but then she began to speculate whether His Word should be taken literally, or whether, perhaps, it even applied to her in her new situation with her greater maturity. Then she observed that the "scientific" testimony of her senses as she examined the fruit conflicted with God's statement regarding its harmful nature. She decided, as so many of us do from time to time, to place more trust in her observational knowledge and in her reasoned conclusions than in the clear statements of God.

The Scriptures are by no means sufficient, of course, to guide all scientific inquiry. There are many areas of scientific interest, more in some sciences than others, about which the Scriptures are silent. But the Scriptures, in addition to providing a framework and motive for science, do provide several concepts and data reference

points which are valuable in particular sciences. Two mistakes can be made in this regard, namely, trying to get too much out of the Scriptures and trying to get too little. You students must encourage us to work along the narrow road between the two.

There is one thing, however, which you may not demand of us, and that is that we arrive at unanimity in our theoretic conclusions. This is a "sad" point, but one that follows directly from the nature of scientific inquiry itself. Science is based on a continual interplay of observation and reasoning, yet observation and reasoning themselves teach us (and the history of science confirms this) that observation and reasoning invariably generate theories both more and less accurate, and that the difference between the two requires an indefinite period of time to ascertain. As one noted secular scientist put it, "Science does not rest on rock bottom."

Contrary to the popular impression that science deals with "cold, hard facts," much of science is concerned with subjective judgments regarding which data are significant, and also with "gut level" or religious commitments to certain guiding presuppositions. If we could "read" the data of God's world correctly, we could avoid such difficulties. But both because we still sin and because we are finite, we cannot perfectly read God's world, and differences on matters of theory will continue to arise among Christian scientists as well as among scientists in general. You can, however, expect unity of spirit; unity in commitment to examine and re-examine the data of God's Word and God's world on particular issues; and unity in community: the desire to work with other Christian scholars, to challenge and be challenged by them, to uncover and express the ultimate harmony that exists in the One Word of God revealed in Christ, in the Scriptures, and in the created order.

In this connection, we as teachers at Dordt College have the right to demand something from you students, too. We want you to become familiar not only with what we believe but, much more importantly, with why we believe it. Critically evaluate our positions or lack of positions, and speak up. You, too, are part of the community of Christian scholars at Dordt College, and we are students or learners, hopefully to a greater and not to a lesser extent than you are.

The need for students, especially at college level, to become involved with the "why's" behind conclusions was brought home forcefully to me in a doctoral seminar at graduate school last summer. We were studying the contribution of the Calvinists to the "social and intellectual history of the United States." The instructor, somewhat to my surprise credited the Calvinists with major contributions, but then went on to say that the Calvinists had died out in the 1800's. While I was recovering from this greater surprise, the instructor explained that Calvinism had died because it was too intellectually sophisticated. One generation expounded a system of thought, the next generation remembered the thoughts and lived by them, but it did not understand the "why's" behind the system and could not teach the system to its children. Does that sound like Israel's pattern? Don't let that happen to us.

Demand of your teachers not only that we share what we have concluded from our studies of the sciences and the Scriptures; demand also that we show you how we used both scientific data and the Scriptures in arriving at our conclusions, and expect us to demand that you learn to do the same. Working together, then, and using the data of both God's Word and God's world to the fullest, let us continue to apply our faith in God as Creator to the various problems that confront us in this generation.