works in progress, some … with a great deal of promise" (p. 250) … "The models, proposals, scenarios, and constructs we have examined are just what their names imply: tentative but serious and precise models" (p. 253).

However, since "science has an impressive track record" (p. 254), Calle believes that

> there is little doubt that science can explain the universe, as evidenced by the extraordinary advances in our understanding of the evolution of the early universe right up to an instant after the big bang. If one of the present models or a more advanced one yet to be developed turns out to be the correct one, the problem of origins would be fully explained and the creator wouldn't have a job to do. The universe and its laws of physics would have no origin and would not need a supernatural designer. The fine-tuning observed would be the result of the laws of physics—the universe's watchmaker—that evolved purposelessly and mindlessly to create the equilibrium and order that we see. (P. 255)

Calle assumes that scientific investigation will show the ultimate physical laws to be self-explanatory. He avoids discussion of Gödel's theorem, which contradicts this belief on mathematical grounds. The multitude of structures within Max Tegmark's Level IV (Ultimate Ensemble) multiverse classification are also ignored. Here too, Calle introduces science into philosophy by judging purpose versus purposelessness, mindfulness versus mindlessness. Calle's claim, that science eliminates need for God, is consistent only if God is a "god-of-the-gaps" type, but not if God is responsible for both the physics and the physical laws.

This book is worth reading for those interested in a well-written and entertaining review of developments in modern cosmology and today's cutting-edge research, but not caring about Calle's overall intent. I do not recommend it for anyone tired of simplistic antitheist "god-of-the-gaps" presentations.

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Letters

A Reply to "Seeking a Signature," an Essay Review by Dennis Venema

Venema's (*PSCF* 62, no. 4 [2010]: 276–83) "scientific critique" of Stephen Meyer's book, *Signature in the Cell*, fails to come to grips with Meyer's main thesis, which is that an unplanned nature is impotent in the generation of the information contained within the first cell. Certainly, random mutation linked to a selector such as natural selection can produce functional information, but is such information sufficient? Since God may superintend nature, the scientific question is this: Does an unplanned nature have the potential to generate the information contained within the first cell?

Random mutation plus natural selection is not "a candidate for the origin of biological information from nonliving precursors."[1] Natural selection occurs between living cells. No comparable selective activity exists within the abiogenic world. While an RNA world might catalyze amino acid polymerization, it would not generate information any more than stringing letters together would produce prose. Such polymerization might include non-biological amino acids and R-isomers, which would further obstruct the generation of information. An RNA catalyst may preferentially select some amino acids over others, generating uniformity rather than complexity. A functional RNA molecule is not a template for a functional protein, and it does not explain any information contained within genetic RNA or DNA.

Fewer than 10^{46} carbon atoms exist in the upper 10 kilometers of Earth's crust, and fewer than 10^{44} polymers of 100 amino acids would exist at any moment in time. If each polymer reshuffled its amino acid residues once per second for 3 billion years, fewer than 10^{61} polymer variations would be available to explore sequence space.

Cytochrome *c*, an enzyme composed of 101 to 104 amino acid residues, has 27 necessary and specific amino acids, each located at a specific site along the protein chain. The probability of sequencing the appropriate codons for these amino acids is 1 chance in 10^{35} per try.[2] By extrapolation, an average-sized protein with about 400 amino acid residuals would contain somewhere between 81 and 108 specific amino acids located at specific sites. The probability of ordering the codons for such amino acids ranges between 1 chance in 10^{105} per try and 1 chance in 10^{140} per try.[3] Fewer than 10^{61} protein variations exploring sequence space falls short in the generation of an average-sized protein-folding motif by a factor greater than 10^{44} to 10^{79}.[4]

An unplanned evolution has produced fewer than 1050 proteins to explore sequence space[5] and is impotent in the generation of one average-sized protein-folding motif. Hundreds of such protein-folding motifs, and those larger,[6] had to be present among the "immortal" genes. The probability of assembling the more than 810 specific amino acids in the generation of only 10 of these protein-folding motifs[7] would be less than 1 chance in $10^{1,050}$ per try.[8] A multiverse containing 10^{500} universes and producing fewer than 10^{586} proteins exploring sequence space[9] is totally impotent to the task.

Sean Carroll wrote, "(I)t is probably 50 to 100 times 'easier' (i.e., more likely) to disrupt a gene than it is to make a precise specific single mutation."[10] Assume that 50 of the 500 "immortal" genes are assembled. The 50 genes are identical to fossil genes. For every beneficial mutation in the building of the 51st gene, the intact genes, as a group, are disrupted at 50 to 100 sites. No evolutionary progress occurs when 50 functional genes are lost as one functional gene is assembled.

An unplanned nature is impotent in the generation of the information required by the first cell. This is not a scientific conclusion but a logical conclusion based on probability. No "… thorough search through all proposed

mechanisms …"[11] need be made. The average layman is fully capable of arriving at this conclusion. Even though Stephen Meyer committed several rookie errors, his main thesis is correct. The generation of the information contained within the first cell requires intelligent oversight, superintendence, and/or design.

Finally, a planned evolution is fully compatible with common ancestry, descent with modification, orthogenic proteins, stratification, and the fossil evidence supporting evolution, for what could an unplanned evolution do that a planned evolution could not do?

Notes

[1]Dennis R. Venema, "Seeking A Signature," *Perspectives on Science and Christian Faith* 62, no. 4 (2010): 280.

[2]Of the 27 specific amino acids in cytochrome c, Arg. occurs twice (2) and has six [6] codons; Asn (2), [2]; Cys (1), [2]; Gly (7), [4]; His (1), [2]; Leu (2), [6]; Lys (3), [2]; Met (1), [1]; Phe (2), [2]; Pro (3), [4]; Thr (1), [4]; Trp (1), [4]; Tyr (1), [2]. Calculate the probability of the natural assembly of these 27 specific amino acids: A probability of $(1/64)^2 \times (2/64)^{10} \times (4/64)^{11} \times (6/64)^4$ per try = $1/10^{35}$ per try or 1 chance in 10^{35} per try.

[3]27 a.a.x3 = 81 amino acids and 27 a.a.x4 = 108 amino acids; $(10^{35})^3 = 10^{105}$ and $(10^{35})^4 = 10^{140}$

[4]$10^{105}/10^{61} = 10^{44}$ and $10^{140}/10^{61} = 10^{79}$

[5]Fredric Nelson, MD, "Tossing Darwin out of Science," as found at evolutionneedsanadjective.com.

[6]F. S. Collins and K. G. Jegalian, "Deciphering the Code of Life," as found in *Understanding the Genome* (New York: Warner Books, 2002), 29.

[7]>81 specific amino acids located at specific sites/average-sized protein x 10 average-sized proteins = >810 specific amino acids located at specific sites.

[8]$810/27 = 30$; $(10^{35})^{30} = 10^{1,050}$

[9]$<10^{61}$ proteins/planet x <10 planets/star x $<10^{24}$ stars/universe x 10^{500} universes = $<10^{586}$ proteins exploring sequence space.

[10]Sean B. Carroll, *The Making of the Fittest* (New York: W. W. Norton & Co., 2006), 159.

[11]Venema, "Seeking A Signature," 281.

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A Reaction to "Seeking a Signature," an Essay Review by Dennis Venema

I was deeply disappointed in the review by Dennis R. Venema of Stephen C. Meyer's recent book, *Signature in the Cell: DNA and the Evidence for Intelligent Design* (*PSCF* vol. 62, no. 4 [2010]: 276–83). Venema does not need to be impressed by the lively endorsements the book has received, or the prominence the author of the book has attained, but he could have done what book reviewers ordinarily do—give a fair and balanced approach to the book before him.

His patronizing tone is annoying. Collegiality deserves better, especially when the colleagues are working for a common cause. Does it not seem strange that what praise he has for the book he will leave unsaid, "not out of disrespect, but rather out of respect"?

Venema comes to the book with a mindset which assumes that in due time scientists will solve the origin-of-life problem—and will do so at a naturalistic level. With such a mindset, no study which advances intention, purpose, design, a miraculous bestowal on biological processes, will persuade him of alternatives. He says that "it is a reasonable expectation that further research will continue to pay dividends." With such a mindset one can predict the results. Venema ignores the forensic contribution to the discussion which Meyer's book makes. And then he finds what he regards as flaws in Meyer's argument that would militate against the notion that information can arise in the cell through natural causes. He skirts Meyer's observation that scientists have called off the debate about "What is science?" since there are at least thirty ways of doing science. Venema has bought into the model of philosophic naturalism—whatever his personal beliefs may be. Meyer has earned the right to say that "Intelligent design is an inference from scientific evidence, not a deduction from religious authority." And he has the backing of Philip Skell, who says about Meyer's book that "it demonstrates what I as a chemist have long suspected: undirected chemical processes cannot produce the exquisite complexity of the living cell."

Marilyn Robinson and others have recently observed that science for the last 150 years, for all the undeniable practical benefits and insights into nature which science has given us, has also left us with philosophies that lead to despair and nihilism. George Gaylord Simpson is one spokesman for this more recent approach: "Man is the result of a purposeless and materialistic process that did not have him in mind. He was not planned." Is Venema really comfortable with the implications of his naturalistic approach?

And have we really gone beyond Sir Isaac Newton, who asks,

> How came the Bodies of Animals to be contrived with so much Art, and for what ends were their several parts? Was the Eye contrived without Skill in Opticks, and the Ear without Knowledge of Sounds? … And these things being rightly dispatch'd, does it not appear from phenomena that there is a Being incorporeal, living, intelligent …? (Meyer, p. 11)

One might add, does common sense not explain the existence of pyramids, the space shuttle, the Aswan Dam—rational minds intending to bring about a desired result? Or how explain the bacterial flagellar motor that inhabits the cell, with what resembles a thirty-part rotary engine, or the 500 bits of information present in a cell and necessary to synthesize protein? Or the tiny apparent "turbine" with nine tilted blades that inhabit a centriole? (Meyer's examples.)

Given his commitment and his position, shouldn't Venema be placing his shoulder behind a different wheel?

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