The North Texas Skeptic

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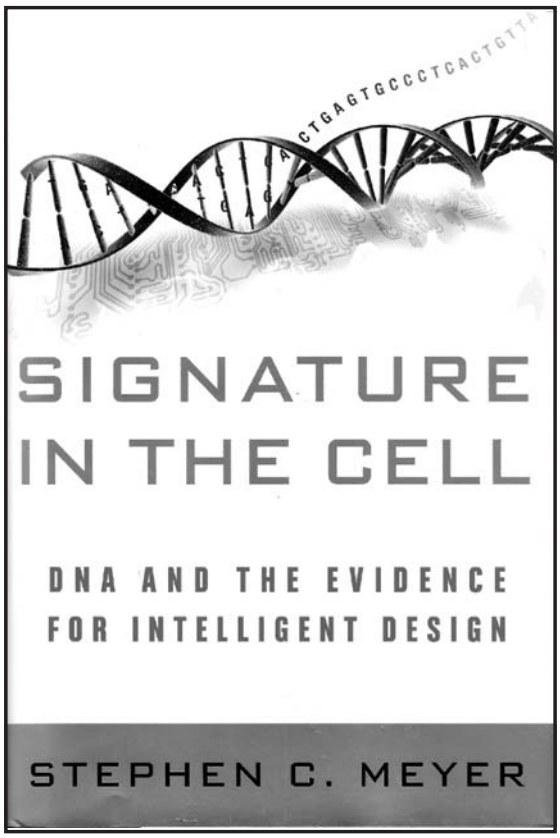
Information and myth

by John Blanton

Stephen C. Meyer
Signature in the Cell
2009, HarperOne, 624 pages



Having nothing better to do, I was watching this on-line video. And the guy was making some statements about matter and information and energy, and, being composed of these things and having studied them in college, I was a little amazed at what the guy was saying. Time for a Slim Pickens movie quote here. [1]

The speaker was creationist Stephen C. Meyer, and that was no surprise. Meyer has just published his latest creationist book, and having nothing better to do, I ordered a copy from Amazon.com. Here is what Amazon has to say about the author:

> Dr. Stephen C. Meyer received his Ph.D. from the University of Cambridge in the philosophy of science. A former geophysicist and college professor, he now directs the Center for Science and Culture at the Discovery Institute in Seattle.[2]

EVENTS CALENDAR

September program

Saturday 19 September 2009
2 p.m.

Center for Nonprofit Management
2900 Live Oak Street in Dallas

Conspiracy Theories

- Lyndon Johnson and the CIA murdered JFK.
- The moon landings were faked.
- And the Bush administration orchestrated the 9/11 attacks.

It's all conspiracy, and it's all phony.

John Brandt will explain why these ridiculous hoaxes persist.

See Events — page 6

Much is promised for this book. It's supposed to set us straight about the basis for Intelligent Design and to make the case, using the story of DNA, for Intelligent Design. Once again, I will let Amazon do the talking:

> *Signature in the Cell* is the first book to make a comprehensive case for intelligent design based upon DNA. Meyer embarks on an odyssey of discovery as he investigates current evolutionary theories and the evidence that ultimately led him to affirm intelligent design. Clearly defining what ID is and is not, Meyer shows that the argument for intelligent design is not based on ignorance or "giving up on science," but instead upon our growing scientific knowledge of the information stored in the cell. [3]

So far so good. This could prove interesting. I started with the prologue.

Oops. In the first few pages Meyer stumbles over the Sternberg affair.

Richard Sternberg was editor of the scientific journal *Proceedings of the Biological Society of Washington*in 2004 when the journal published a peer-reviewed paper by Stephen C. Meyer. The paper is titled "The origin of biological information and the higher taxonomic categories," and it reaches the following conclusion: "… purposive or intelligent design as a causally adequate—and perhaps the most causally adequate—explanation for the origin of the complex specified information required to build the Cambrian animals and the novel forms they represent." [4]

The paper was a clear endorsement of Intelligent Design, and the scientific community was miffed, to say the least. Scientists have been chiding the creationists for years for peddling their wares to media outlets and school boards and avoiding peer-reviewed science. Suddenly the creationists had gotten on the scoreboard, by some means. Others on the editorial staff of PBSW charged that Sternberg bypassed the accepted review process and published Meyer's paper without consulting them. Sternberg will not reveal who reviewed the paper, and he is not required to.

Attention immediately turned to Sternberg, an obvious creationism sympathizer. More followed, and this is what Meyer has to say about the affair:

> … The editor, Richard Sternberg, lost his office and his access to scientific samples and was later transferred to a hostile supervisor. After Sternberg's case was investigated by the U.S. Office of Special Counsel, a government watchdog organization and by the U.S. House Committee on Government Reform, a congressional committee, other questionable actions came to light. … [5]

Meyer notes that senior administrators at the Smithsonian Institution questioned Sternberg's colleagues about his religion and politics and

instigated a campaign to damage his professional reputation and to get him to resign. Sternberg did not resign, but he was demoted.

Meyer gets some of that right, and that's the unfortunate part—for Meyer. The problem is this pronouncement by Meyer reveals that Meyer's infatuation with the truth is a sometime thing.

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Rather than recapitulate the entire episode here, I will summarize and point to the rest of the story: As written, Meyer's account leaves the casual reader thinking here was a guy getting the short end of a dirty stick. Meyer neglects to mention that Sternberg was not employed by the Smithsonian Institution. He was employed by the National Institutes of Health. Sternberg was receiving free office space at the Smithsonian to do his research, and he did have to give up his office. So did another researcher. Both had to move their offices to make room for another project that needed the space. Sternberg did not like the new office the Smithsonian offered, so he was offered another space. And there is more.

Meyer does not mention these points, and a naïve reader will be left with the wrong impression of what transpired. It's the impression Meyer wants to leave, and that's why the careful reader of *Signature* will step lightly through the remainder of the book.

Rather than keep you in suspense, the answer is yes. This book is the biggest piece of creationist propaganda to come our way in years. And we welcome it.

Others have covered the Sternberg affair in depth, and readers are invited to explore the whole story. The National Center for Science Education is a good place to start. [6]

So, Intelligent Design is still not being published in peer-reviewed scientific journals, and Meyer defends the publication of Intelligent Design in a book. He points out that Darwin popularized evolution in *The Origin of Species*. Also Copernicus, Galileo, Newton, and Lyell used books to popularize their ideas. Meyer fails to follow through and mention these scientists had some science to popularize.

A comparison of *Signature* with *Origin* is enlightening, as well. In *The Origin of Species* Darwin tells the story of the progress of an idea, and he illustrates his points using observations of nature and the work of contemporary scientists. For Meyer, *Signature* is a personal journey, and he illustrates the journey with stories from his own life and experiences. In a process called *quote mining* Meyer cites selected references by famous and respected people to support his argument.

Meyer went for a Ph.D. in history of science at Cambridge after his career as a geophysicist was ended by falling oil prices. It's not say Meyer had an epiphany and suddenly saw Intelligent Design in a flash of light. *Signature* leaves no doubt Meyer was always comfortable with Intelligent Design.

So, what is *Signature in the Cell* all about? Let's take a tour. About the best reading is Chapter 2, which is a long and well-researched discourse on the history of science and the search for the origins of life. Chapter 3 is a good discussion of the Watson-Crick discovery of the structure of DNA. And that's about as good as it gets.

In summary, Meyer hinges his argument, the entire book, on a single assertion: Useful information can come only from an intelligent source. Meyer used a very simple method for making this argument. He keyed the words in from his computer. What's more, to make sure his assertion is true he repeats it several times in the book. Here is a sample:

> Intelligence is the *only known cause* of complex functionally integrated information-processing systems. [7]

Here's the problem. While we might agree on what counts for useful information, neither Meyer nor anybody else has provided an acceptable definition of an intelligent source. Meyer's assertion that useful information can come only from intelligence is absolutely false. I am making this statement with the same authority Meyer makes his argument. I am sitting at my computer and typing it in. Here it is.

About 60 years ago Claude Shannon developed a quantitative definition of information. Shannon was interested in the information carrying capacity of communications channels, so this was a useful enterprise. I will skip the math and give the Cliff's Notes view. [8]

Information, especially information coming over a communication channel, is knowledge you did not have before. If somebody is talking to you and says "I already told you it's raining in Cincinnati," that person is not supplying additional information. A rough measure of the amount of information in

a message or a computer file is the degree to which the missive can be compressed. The WinZIP utility you have on your computer does a good job of compressing text files. GIF images employ LZW compression to reduce the amount of space required to store them. Both of these techniques work by eliminating redundancy—duplicate information. [9]

Now, suppose somebody told you something that you might not presently know, but which you should have known. "You left your briefcase in my car." This might be helpful, but it is not new information, even to you.

Suppose somebody tells you "You are on Orange Street." You look up and see the street sign. You did not get new information from the speaker. That is, the speaker was not creating new information.

Here is a tougher one. Until the 1960s nobody on Earth knew what the back side of the moon looked like. When the Soviets sent a space craft past the moon we got our first look, but this was not new information.

Albert Einstein was a genius, and he disclosed the relationship between matter and energy ($e = mc^2$). This was not new information. In this as in many things we can say, "The truth is out there."

All these examples have a common thread. The best work of intelligent beings has not produced any new information. Contrast this with Meyer's claim that useful information comes from intelligence.

What are some examples of useful information coming from intelligence? Meyer claims design comes from intelligence. Instead of the word *design* I will substitute *invention*. I do this for a simple reason. We have stupid computers that do design. Here is an example:

As a young engineer I carefully laid out the electrical leads for a circuit board design. Now computers do this automatically. Computers do not add any information when they do this. The information is already there when the board designer decides what components to put on the board and supplies some design constraints. The operation of the computer is said to be *deterministic*. Given the same input, the result is pre-determined by the mathematics involved. When I laid out the traces on a board I was not generating new information.

In a larger view, if the universe operated by completely deterministic process, then no new information would be created. Fortunately for us, the universe is not deterministic. One thinks first of the so-called butterfly effect. The butterfly effect is used to illustrate how small variations within a non-linear system can propagate into large differences after sufficient time. However, the butterfly effect is not an example of non-determinism at work. The butterfly effect would work even within a deterministic system.

So, are there true, non-deterministic processes? The answer is *yes*. A trivial example would be alpha decay of radioactive nuclei. On occasion, for no cause, an atomic nucleus will eject an alpha particle. The previous condition of the nucleus does not determine when the alpha particle will be ejected. Take special note: When Meyer talks about causes in his book, and he does this a lot, he could be talking about absolutely nothing.

So, truly novel information can be, and is, created. So there must be examples. I have never seen it happen.

. . . Meyer hinges his argument, the entire book, on a single assertion: Useful information can come only from an intelligent source.

I've done some inventing, so I have given a lot of thought to the origins of invention. When the boss said "We need a bracket to hold up this gear," then no invention was required. There are not many novel ways to solve the problem.

But once the boss said, "We've had a bunch of people working on this, and nobody knows how to make it work. You give it a try." OK, maybe this could be an real example or invention. I took this occasion to study the process in real time, and here is what I observed:

I looked at one solution and thought, "No, this has been tried, and it won't work." I looked at other possibilities and thought, "No, we can't afford to do it this way. And, besides, there is not enough time."

In college I took a course in differential equations. These are generally considered to be mental challenges for under graduates, and the professor told us this: "One way to solve a differential equation is to stare at the problem until a solution comes to mind." In other words, the solution might just come out of the blue.

That's where my first patented invention came from. I cleared my brain and thought about a bunch of odd stuff. And I took a bathroom break. When I returned to my desk I had the solution.

What I think really happened is this: I turned my thoughts loose. My brain escaped from the rut in which it had been

confined and roamed through a random bunch of possible approaches. I seized on the first workable solution that came to mind and went with that. I contend that is where apparent creativity (intelligence) comes from.

I can't relate this to acts of genius outside my scope. There is no way I could create something like Beethoven's Ninth Symphony. I have tried composing music, but my brain will not string together two notes that are pleasant to listen to. So, how did Beethoven and others create their masterpieces? I can't answer, but my bet is these guys started out ahead of everybody else and then applied themselves.

Anyhow, that's genius. That is creativity. Does it take a person (intelligence) to do this? It is likely Meyer will say it does. Meyer extends his claim that creation comes only from intelligence, and he takes issue with examples of creativity that employ genetic algorithms (GA).

Genetic algorithms mimic the evolutionary processes of mutation and natural selection to solve hard problems—problems that would ordinarily be relegated to human brains. The programmer supplies some rules then allows the computer to search for a solution within the confines of the established rules. The computer uses randomization algorithms (random mutation) to establish variability within the problem's solution space, then it evaluates multiple solutions for fitness. Solutions that score well are used in the next round of trials (natural selection), and the process is repeated until a useful solution is established. Meyer cites creationist William Dembski and asserts that programmers who set up these problems load in the solution up front by setting the conditions for the problem. This leaves the computer nothing to do but run to the ultimate, inevitable solution.

This book is the biggest piece of creationist propaganda to come our way in years. And we welcome it.

Strictly speaking, Meyer is correct, but that does not help him. The success of genetic algorithms only displays that novel information is not required for mutation and natural selection to produce improved (better fit for reproduction) populations of living organisms. Here is an example:

Using genetic algorithms, Kumar Chellapilla and David B. Fogel developed a neural network for playing checkers. The constraints that were front-loaded were minimal. They were the rules of the game. The only fitness measure was winning. Bear in mind, the genetic algorithm was not use to play checkers. It was employed to develop the program that played the game. The resulting game, a computer program, was tested in play.

> The best result from the 165 games was obtained when the network defeated a player rated 2173, just 27 points away from the master level, who was ranked 98th out of over 80,000 registered players. [10]

The reason a GA cannot develop new information is that it is deterministic. There is no real randomization in the *random mutation* part. The GA uses a pseudo-random number (PRN) generator that mimics randomization. The programmer starts off by feeding the generator an arbitrary number (seed). The generator starts with the seed number and churns through a convoluted sequence of operations to produce a new number. This result is employed as though it were truly random. The PRN generator also saves this result and uses it when it needs to compute a new PRN, else the programmer would have to keep providing arbitrary seed values. In this case the results would then not be so arbitrary, and they would by no means be random. The results are not truly random, anyhow, but good PRN generators produce sequences that are hard to tell from really random sequences. Another way of stating this is, "It would be very difficult to predict the next PRN by looking at previous values in the sequence."

Meyer's (and Dembski's) contention that intelligence is required to produce new (and useful) information becomes a bit strained in the light of all this. To give Meyer his due, here is the best translation of what he says in the book: Random mutation and natural selection may be able to account for the variety of life forms that sprang from some original, simple cell. But these processes cannot account for the new and useful information that created the original cell from Earth's elements.

This leads Meyer to consider whether the information represented in all current life forms was pre-packed (front-loaded) in the original cell. Here Meyer is covering ground previously explored by creationist Michael Behe. Behe took some serious ribbing at the time when his detractors made comparisons with the total information in extant life with the amount that could be packed into that first cell.

> If design was thus "front-loaded" in the first simple cell, what does that imply about the capacity of cells to store information for future adaptations? And what should the structure and organization of the prokaryotic genome look like in this case? [11]

No matter. The universe does not use a PRN generator. Truly random processes are available to produce all new (and useful) information required for present life.

Earlier in this long harangue I made the following questionable statement, "The best work of intelligent beings (us, of course) has not produced any new information." For those of you preparing to hang me with this, I will now amend it. When intelligent beings generate new (useful or not) information, they employ truly random processes.

And that wraps up the story. Paradoxical as that may seem, the source of new (including new and useful) information is true randomness. Meyer has written an entire book based on an incorrect assumption. And I bought the book.

I did not read the book in great detail. Many parts were repetitious, or else they covered ground that had been covered before, and I skimmed them. I did pick up a *few* hints that *Signature* is not all that well researched, but these are trivial and will likely be fixed in a future edition. For example, Meyer discusses work related to information theory and carried out by John von Neumann in the 1960s. The problem is von Neumann died in 1957. I was also puzzled by Meyer's description of his first meeting with creationist William Dembski in the summer of 1992. I had always suspected the two met in March of that year at SMU when they presented papers at the conference on "Darwinism: Scientific Inference or Philosophical Preference." Meyer states in the book that he actually attended the conference, but it is possible Dembski had somebody else present his paper. [12]

If you insist on buying the book, please follow the link in the notes below. The NTS will get a commission from Amazon.

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References

1. The quote from *Dr. Strangelove* is near the end of the article. http://www.ntskeptics.org/2009/2009july/july2009.htm #edge
2. http://www.amazon.com/exec/obidos/ASIN/0061472786 /thenorthtexasske
3. *Ibid*.
4. http://www.discovery.org/scripts/viewDB/index.php ?command=view&id=2177
5. *Signature in the Cell*, page 2.
6. NCSE supports the Expelled Exposed Web site at http://www.expelledexposed.com/index.php/the-truth /sternberg
7. *Signature in the Cell*, page 346. Italics are in the original.
8. Read about information theory here: http://en.wikipedia.org/wiki/Information_theory
9. http://en.wikipedia.org/wiki/LZW
10. http://bit.csc.lsu.edu/~jianhua/GA_checkers.pdf
11. *Signature in the Cell*, page 480. However the best information is that Behe now disavows the preloading of genetic information in the first cell.
12. http://ebd10.ebd.csic.es/pdfs/DarwSciOrPhil.pdf Also at http://www.ntskeptics.org/creationism/DI/DarwSciOr Phil.pdf

Events

NTS Board meeting and social dinner

Saturday
26 September 2009
7 p.m.

Don Mexico
12255 Greenville Ave # 130
Dallas, TX 75243-3586

Let us know if you are coming. We sometimes change or cancel these events.

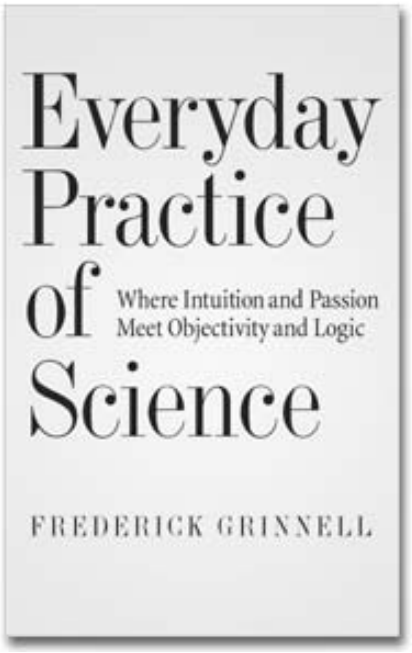
Phone (214) 335-9248

Everyday Practice of Science

Fred Grinnell is a professor at the University of Texas Southwestern Medical Center. He is a notable supporter of evolution (and opponent of creationism) of long standing. A few years back he gave a talk at one of our meetings about his book *The Scientific Attitude*.

Dr. Grinnell has just published *Everyday Practice of Science: Where Intuition and Passion Meet Objectivity and Logic*(Oxford University Press, 2009). I have not read the book, but Janet Stemwedel has published a review on scienceblogs.com:

Scientists are not usually shy when it comes to voicing their frustration about the public's understanding of how science works, or about the deficits in that understanding. Some lay this at the feet of an educational system that makes it too easy for students to opt out of science coursework, while others blame the dearth of science coverage in our mass media.



Rather than casting about for a villain, cell biologist Frederick Grinnell has written a book that aims to help the non-scientist understand what scientific practice looks — and feels — like to the scientists. This description of scientific activity connects the dry textbook accounts of scientific method to the vibrant, messy, frustrating yet invigorating terrain scientists inhabit as they try to build new knowledge. Grinnell's book also connects the scientists' world to the vibrant, messy, frustrating yet invigorating world they share with non-scientists as he considers ethical and societal dimensions of scientific practice. [1]

You can order your own copy from Amazon.com, and the NTS will get a commission. Amazon's price as of today is $22.36. Shipping will be free if your total order is $25 or more. Use the link below.[2]

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References

1. http://scienceblogs.com/ethicsandscience/2009/03/book_review_everyday_practice.php
2. http://www.amazon.com/exec/obidos/ASIN/0195064577/thenorthtexasske

We get letters

Date: Friday, August 21, 2009, 10:54 AM

Dear NTS,

It has come to my attention that one of your staff members, namely John Blanton has been trying to find a way to prove DR. Patton's credentials have been falsified. The problem is, there is overwhelming evidence (to include the official records) and several witnesses that prove the contrary.

I am someone that demands unbiased science based on fact. I don't care what camp you belong to, as long as you are reporting factual science or at least credible theory. I would even accept maybe some biased as long as the facts defend your case. There should be no deceit, half truths, withholding facts, or misrepresenting/twisting facts. Just what you have observed and discovered. That is the only way science will be able to progress and come closer to finding or proving (i.e. life origins) theory.

Continuing to find a way to discredit Dr. Patton after overwhelming evidence proving his credentials is misrepresenting/twisting, and deceitful. Although this specific issue is not science, it shows the conscience of the scientist or representative whom is trying to bring Dr. Patton down, and at the same time, discrediting the scientific information brought forward by Dr. Patton.

Whether or not you accept Dr. Patton's theories and science, you cannot say that he has twisted information, or misquoted any other scientist. He has been honest, upfront, and forward with all the information he has represented. I have personally checked references of where he has quoted very reputable evolutionists, thinking myself that he must have misquoted, or used ellipses to take away from what the scientist was actually saying, thereby twisting there words. It astounded me to find out that these evolutionists actually have stated these comments in the context Dr. Patton quoted them.

If this is the kind of tactics that are common for the NTS community, this proves that you have no credibility. If you are willing to discredit a reputable scientist just because he he is able to hold a good argument against your theories, what else will you do to try and discredit apposing theory? evidently not with science but with slander.

In closing, I hope that you will quit this nonsense and in the future stick to the facts. I feel it is necessary for one to prove their claimed credentials, but once proving documents are brought forward, you need to move on and accept the facts.

Sincerely,
Jared Mc Cormick

(no earned degree or scientific credentials, just an avid lover of science, physics, facts and truth.)

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