The Light Bulb

—The semiannual newsletter of… IDEA

Volume IV
Issue 1
Spring, 2005

Intelligent Design and Evolution Awareness Center

A Tale of Two Genes

A Summary of Behe and Snoke's article testing Evolution by Gene Duplication*[1]*-- By Casey Luskin

This summer, biochemist Michael Behe and physicist David Snoke co-authored an article published in the journal *Protein Science* with bold conclusions regarding the origin of biological complexity. They determined that using a classical evolutionary explanation to specify just a few amino acids in a protein, to evolve a functional and interactive bond between two proteins would be highly unlikely in populations of multicellular organisms. This poses a major stumbling block for the evolution of biochemical complexity.

How did they arrive at this conclusion? Their argument relies upon computer modeling and math and gets fairly complicated at points, especially for the uninitiated. But their argument can be boiled down for the layperson, revealing important implications for the debate over intelligent design.

Sibling Rivalry: The story of Gene and Jean.

This is a story about the origin of biological complexity. It's like the story of a family with a small business and twin siblings—Gene and Jean. The family business needs one kid—but only one kid—to help mom and dad keep shop. One twin, Gene, responds to that pressure and stays home to work the family business, but this frees Jean, to go off and explore the world and do something new and different. Had there been only one kid, there would have been great pressure upon him to stay home and work for mom and dad. But because there were two, the pressure on one of them was relaxed. And Jean is probably out enjoying her career as the elephant janitor in the circus.

Continued on page 4

GREAT NEWS!

We are proud to announce that the IDEA Center has received confirmation of our 501(c)(3) non-profit status from the IRS. This means that donations made to the IDEA Center are now tax deductible. Please contact us if you have any questions or would like verification of our status.

Contents:

For more information about the IDEA Center, please visit

www.ideacenter.org

IDEA Center
PO Box 17424
San Diego, Ca 92177

Phone: (858) 337-3529
Fax: (858) 569-8184
E-mail: info@ideacenter.org

[1] The specific title of the paper is "Simulating evolution by gene duplication of protein features that require multiple amino acid residues," by Michael J. Behe and David W. Snoke, *Protein Science*, 2004 (13).

IDEA Center News and Events:

IDEA receives 501(c)(3) status!

It's official! After filling out many forms and being very patient, the IDEA Center is pleased to announce that we have received confirmation of our status as an IRS 501(c)(3) nonprofit organization! This means that all donations to the Center are deductible from federal income tax. For those interested in confirming our status, copies of the determination letter are available upon request.

Conferences Three:

Over the past few months, the Center has participated in three ID conferences. In April, IDEA staff hosted a booth at a large conference at Biola University. We had a great time talking to attendees, and selling books and videos. In June, 2004, IDEA staffer Casey Luskin spoke to students at an "ID Conference" in beautiful Highlands, North Carolina. Finally, in September, 2004, Casey spoke on starting IDEA Clubs and the "Privileged Planet" at the Darwinism, Design, and Democracy (DDD) V Conference in Albuquerque, New Mexico. DDD is an annual conference sponsored by the Intelligent Design Network. It draws people from across the USA as well as internationally.

Intelligently Re-Designed IDEA Center Website

The IDEA Center is excited to announce that since the last newsletter, our long - awaited redesigned website (ideacenter.org) went online. Our old site was sufficient, but lacked the charm and ease-of-navigation of a professionally designed site. As of April, 2004, the new site has the following features:

- New Articles
- Frequently Asked Questions about ID
- Responses to Evolutionist Critiques
- Origins News Updates
- Lending Library
- PDF Copies of The Light Bulb
- How to start an IDEA Club

One important note is that many of our articles are now available in easy-to-print PDF format, so they can be printed for non-profit educational purposes. We hope you will enjoy exploring the site!

Newfangled Web Factory (newfangled.com) designed the site. They created an easier-to-navigate layout and a more attractive graphical look! We are thankful to Newfangled for the wonderful job they did! If you ever need a website designed, and want talented graphical design, intelligent layout, and easy-to-use content management, look no further than Newfangled.com!

IDEA Center Updates its Mission Statement

Beginning in Winter, 2004 and culminating at our final 2004 meeting of the IDEA Center Board of Directors, the IDEA Center mission statement has been refined and updated. After about 3 years in existence, the Board decided that our mission statement was not perfectly conveying what our organization does, and decided it was worth updating. Additionally, controversy had surrounded the IDEA Center's mission statement as some skeptics thought we were trying to hide a religious affiliation. Our new mission statement, as well as additional details can be found on pages 8-12.

IDEA Club Student Chapter Updates

IDEA Clubs continue to form at a growing pace on university and high school campuses—15 clubs since the last issue of our newsletter!

- The first IDEA Club in Asia, at the University of the Philippines, Tacloban College.
- Two clubs at public high schools: South Mecklenberg High School in North Carolina and Poway High School in California.
- A big bang of IDEA Clubs in Virginia: Fork Union Military Academy; the University of Virginia; James Madison University, and George Mason University.
- Philosophy major Cody Bell founded the IDEA Club at the Franciscan University of Steubenville in Stuebenville, Ohio, the first IDEA Club at a Catholic University.
- IDEA Clubs also formed at Midwestern State University in Texas, and Seattle Central Community College, both public schools.
- Our first "Ivy League" IDEA Club at Cornell University.
- A club at the University of Illinois, at Urbana-Champaign.
- Two clubs at Christian liberal arts colleges—Westminster College in Missouri, and Corban College (formerly Western Baptist College) in Oregon.
- An IDEA Club at Wake Forest University in North Carolina.

We are working with students to help start clubs in various places. If you know of students, or anyone, who might be interested in promoting intelligent design, please contact us at info@ideacenter.org.

Origins News Update

Peer Review or Peerless Review? "Peer reviewed" articles have been published recently in mainstream scientific journals, authored by ID proponents, and supporting key claims of intelligent design theory.[2] Darwinists often claim ID proponents never publish nor even attempt to publish in mainstream scientific journals. This is then used to justify both the claim that ID is not science, and the argument that it should not be taught in schools. One would think these publications would temper such criticism. Instead, Darwinists have simply raised their standards of proof. Now they insist ID must be commonly used by scientists. In addition, they have made the false charge that one of these articles was pushed to publication without proper scrutiny. Interestingly, the same people who are telling the world that ID is not science because it isn't peer reviewed are the ones telling scientists not to let ID into the journals. In other words, they are purposefully preventing ID from gaining peer reviewed publication and then proclaiming ID isn't science because it has no peer-reviewed publication. Is this playing fair? This unfair and circular argument is not unintentional: it's the symptom of a concerted effort on the part of a few influential Darwinists to prevent ID from gaining legitimacy in the scientific community.

Functions for RNA Revealed: Scientific American has published a second article on so-called junk DNA.[3] One might expect the opening caption came from an ID book: "Assumptions can be dangerous, especially in science. They usually start as the most plausible or comfortable interpretation of the available facts. But when their truth cannot be immediately tested and their flaws are not obvious, assumptions often graduate into articles of faith, and new observations are forced to fit them. Eventually, if the volume of troublesome information becomes unsustainable, the orthodoxy must collapse." The author here is talking about our understanding of junk DNA, which has recently been shown to have functional significance. The article notes that, "For years, molecular biologists have assumed this material was evolutionary junk." This assumption came from evolutionary theory—whereas ID would have led to the assumption that the "junk" is actually functional. This is a classic case where an evolutionary expectation led to false assumptions about the data. If this happened here, could it be happening elsewhere in biology as well?

"Jaw Dropping Theory of Human Evolution:" A news blurb in a *Nature* article[4] notes that evolutionary biologists have a new theory about how the human jaw evolved: a mutation caused primate jaw muscles to lack a key protein, making the muscles weaker, possibly allowing some slack for the jaw to grow larger. While on its face this account isn't very compelling (after all, it's easy to explain evolution by losing structures — but at some point you must explain how to acquire new structures), it has a deeper flaw that reveals the problem with many evolutionary accounts. As one insightful paleoanthropologist observed, "[t]he mutation would have reduced the Darwinian fitness of those individuals … It only would've become fixed if it coincided with mutations that reduced tooth size, jaw size and increased brain size. What are the chances of that?"[5] This is not an isolated problem: much evolutionary complexity would probably require multiple coordinated mutations. These essentially irreducibly complex changes make design look like a better explanation.

Protein Evolution Folds Its Hand: An important question in biochemical evolution was recently tested: how rare is it to get a functional folded protein?[6] All proteins have not just a specific sequence of amino acids, but a three-dimensional structure—the "folded" structure of the protein. The paper's author took a bacterial enzyme which confers penicillin resistance and modified it to see how sensitive its folding structure was to mutations. The study found that functional folded proteins are extremely rare, because for this

---

2 Stephen C. Meyer, "The origin of biological information and the higher taxonomic categories," *Proceedings of the Biological Society of Washington* 117(2) (August, 2004):213-239; Michael J. Bene and David W. Snoke, "Simulating evolution by gene duplication of protein features that require multiple amino acid residues," *Protein Science* (13) 2004 (13).

3 "The Hidden Genetic Program of Complex Organisms," by John S. Mattick, *Scientific American*, September 2004, pg. 61-67.

4 Stedman, H. H. et al. Nature, 428, 415 - 418 (2004).

5 Bernard Wood, in "Gene Mutation Said Linked to Evolution" by Joseph B. Verrengia (San Diego Union Tribune, March 24, 2004).

6 Doulas J. Axe, "Estimating the Prevalence of Protein Sequences Adopting Functional Enzyme Folds," *Journal of Molecular Biology* (2004).

particular protein, the odds of obtaining the protein with its required functional folds were between one in 10^{53} and one in 10^{77}. The article concludes that "generating new folds from parts of old ones may be much less feasible than has been supposed."

Another Functional "Pseudogene?" Scientists have discovered a "pseudogene" in a fish that allows it to survive in sub-freezing arctic waters.[7] The gene was initially dismissed by evolutionists as a nonfunctional pseudogene. Now that its antifreeze function has been discovered, it turns out that it provides protection against freezing that is an entire order of magnitude beyond protection without the pseudogene.

New Terms for Systematics in Origins Discussions: A biologist has suggested that we abandon using terms like "homology" to discuss similarity in sequence structure between proteins, because that implies similarity of ancestry, which might not be true. The biologist argued that we need neutral terms which have "evolutionary and functional neutrality."[8] The suggested terms are "sequelog" and "spalog," where "sequelog" is a neutral term discussing the percent sequence similarity, and "spalog" is a suggested term to discuss neutrally the similarity in the 3-D structure and function of proteins. The upshot here is the recognition that similarity in amino acid sequence or shape does not necessarily say anything about common ancestry. If we use the word "homology" to indicate both similarity and common ancestry, then we may wrongly often confuse the two.

How not to Debate Evolution: In 2004, a Miami TV news station[9] reported that police were called when a student jumped out of a second story window at school to prove a point in a debate with a teacher over evolution! The discussion also involved a $20 bet, which the teacher apparently later paid. In the end, thankfully, the student was not injured, and, unsurprisingly, the teacher was reassigned. Maybe next time they should just start an IDEA Club (and meet in a room on the ground floor just in case).

Quote Qua Quote

"Assumptions can be dangerous, especially in science. They usually start as the most plausible or comfortable interpretation of the available facts. But when their truth cannot be immediately tested and their flaws are not obvious, assumptions often graduate into articles of faith, and new observations are forced to fit them. Eventually, if the volume of troublesome information becomes unsustainable, the orthodoxy must collapse. We may be witnessing such a turning point in our understanding of genetic information."

"The Hidden Genetic Program of Complex Organisms," by John S. Mattick, *Scientific American*, September 2004, pg. 61.

A Tale of Two Genes...

Continued from Page 1

Interestingly, evolutionists tell a similar story when it comes to the origin of biological complexity (minus the part about the elephants). The story begins with a single gene which gets duplicated during the reproduction of an organism.

The result is that the genetic code of the offspring contains two identical copies of the gene. That organism needs only one good copy of the gene to perform its vital function. Thus, according to the evolutionary story, one of these copies of the gene continues to perform the original function, while its twin then enjoys the luxury of being unconstrained genetic material that can undergo mutations, and perhaps acquire some new function in the cell.

---

7 Marshall, Fletcher, and Davies, "Hyperactive antifreeze protein in a fish," Nature 429, 153 (13 May 2004).
8 Varshavsky, Alexander (2004). 'Spalog' and 'sequelog': neutral terms for spatial and sequence similarity. Current Biology 14, No. 5, R181-R183. See also http://www.biomedcentral.com/news/20040309/01.
9 See http://www.poe-news.com/stories.php?poeurlid=32745.

Neutral Evolution

What does it mean to say that some evolution is "neutral?" In Darwin's famous theory, biological structures evolve because they help an organism become better at surviving and reproducing. If a gene undergoes a mutation, it may be preserved (i.e. it is "selected for") because it confers some advantage upon that organism.

It is easy to see how a favorable mutation might become preserved in the line of descent of a population if it aids in survival and reproduction. But what if some mutations are needed if some complex structure is to evolve, but these mutations do not confer any advantage upon the organism? What if an intermediate structure does nothing to help an organism survive and reproduce? In this scenario, what force, or pressure, would there be driving the evolution of such a structure? The answer is that there is no force. Thus, "neutral evolution" is change which is somewhat random: there are no forces of natural selection forcing the gene to mutate one way, or the other. It just happens.

"Neutral evolution" provides the core tenet for Behe and Snoke's test of evolving biological complexity by gene duplication. In the gene duplication story, the duplicate gene is selectively neutral, for there is no selection pressure acting upon it. It can do whatever it wants until finally it luckily stumbles upon a function (or not).

How could we test such a story? According to an article cited by Behe and Snoke, the average gene duplicates once every one hundred million generations—that's once every hundred million years for an organism with a 1-year generation time. Biologists aren't going to test the gene duplication story by looking at replicating cells under a microscope (unless their employer is willing to wait a long time for research publication). Thankfully, the computer age can explore universes previously unreachable. Behe and Snoke made assumptions about populations of replicating "digital organisms" which are trying to evolve common biological complexity, and fed those numbers into a computer. A few hundred million computations later, their results were significant.

Playing the Numbers Game

Behe and Snoke started their test by asking how many mutations it would take to create a common form of interaction between two proteins. To use another analogy, proteins can behave like locks and keys. They must have the proper shape in order to interact with one another. But it doesn't end with shape. If you think back to freshman chemistry, you'll remember (hopefully) that atoms and molecules can carry electric charges. And, as we all know from personal studies on human romance, opposites attract. Thus, sometimes part of their lock-and-key fit is facilitated by having a positively-charged point on one protein interact with a negatively-charged point on another protein. These two points are electrically attracted to one another, and a bond forms. To create such a simple bond, Behe and Snoke noted that it would take between three to nine genetic mutations.

The catch to creating this protein-to-protein bond is that it is not functional until all of the required mutations are in place to code for the amino acids which make the bond possible. Behe and Snoke don't have to establish this point; a biology textbook makes it for them:

> "Acquiring a new function may require many mutational steps, and a point that needs emphasis is that the early steps might have been selectively neutral because the new function might not be manifested until a certain number of steps had already occurred."[10]

There we see that phrase "selectively neutral." The first mutations creating the bond would be neutral because up to that point, they aren't doing anything for the organism. So, essentially, this bond is irreducibly complex, in that it requires a number of mutations to function, and there is no way to achieve function without already having that minimal level of complexity.

[10] Behe and Snoke quoting Li, W.H. 1997. Molecular evolution. Sinauer Associates, Sunderland, MA.

There's another twist. Getting the right mutations is a race against getting the wrong mutations. Imagine a gene which is encoded by a sequence of 1000 nucleotides in the DNA. Each nucleotide position can be one of four possible nucleic acids. Each of the 1000 nucleotide points on the gene are already occupied by one nucleotide. Were there to be a mutation, any given nucleotide would have 3 other options into which it might mutate. Thus if a thousand-nucleotide gene is to experience one mutation, there are 3000 possible mutations which it might experience. Let's assume it takes 3 particular mutations out of those 3000 possible mutations to create a functional bond. At the same time, assume that 2400 out of the 3000 mutations would render the gene functionless—even if it happened to get those other three correct. The three we want have to occur before any of the detrimental mutations occur.

Getting the lucky mutations to produce the functional duplicated gene then becomes like a cheesy carnival game. Here are the rules:

> Step right up, step right up! In this bag are 2,403 marbles. Three of them are blue, 2,400 are red! Pick out the 3 blue marbles before you pick a red one, and you win! All you have to do is pay a dollar and pick three winning blue marbles in a row! Who wants to play?

Most of us would think that the only people who want to play are people who want to lose a dollar. But, the game of evolutionary biology can overcome such odds if there are sufficient chances at playing the game—what theorists call "probabilistic resources." After all, if you play the game enough times, a win is eventually guaranteed.

So the question we must ask here is not whether or not evolution is absolutely totally 100% impossible. The question we are asking is if it is probable—or possible given the likely quantity of available probabilistic resources. Behe and Snoke want to determine the level of probabilistic resources necessary to get those lucky winning mutations before any gene-killing mutations occur and the game is over.

Number Crunching

If you've been following up to this point, I should say that here the argument begins to get a bit more complicated. Behe and Snoke start off with a computer-modeled population containing "N" copies of a duplicated gene. Within these gene duplicates, some of the nucleotides start off in the "incompatible state," meaning that they are not compatible with the new function. They then encode three rules of mutations for the game:

1) Nucleotides in the "incompatible" position can mutate into the compatible state, but this must happen before a "gene-killing mutation" has occurred.
2) Nucleotides in the compatible state can mutate back to the incompatible position.
3) Throughout the simulation, new copies of the gene duplicate can arise, giving you yet another chance to win the game. (It turns out that genes duplicate at about the same rate that individual nucleotides mutate, so the same mutation rate is used for both)

The overall rate of progression toward winning the game is thus a sum of these three factors. Obviously, the more copies of the gene you have (i.e. the higher we make "N"), the more chances we have to play the game, and the more probabilistic resources we have. This is confirmed in that simulations with a higher N are always able to get the lucky mutations quicker than computer populations with a lower N.

In their first set of simulations, Behe and Snoke pretend that natural selection has specified some final state at which the gene will achieve its functions. In these situations, as soon as mutations begin to accumulate, the program checks for the presence of the game-winning mutations. If they aren't there immediately, and if any gene-killing mutations are present, the gene won't benefit the organism, and it loses. With such a stringent requirement, it is hard to win this game.

Yet, in the story of gene duplication, there is often no selection pressure whatsoever on the duplicated gene. It is free to do as it pleases, hoping one day to find some function. Behe and Snoke make this assumption implicit in their model by removing selection and allowing a gene to mutate for various periods of time before any sort of selection is applied. This might, in theory, be helpful, in that when selection is applied, there

could be a chance that one gene with the winning bonding properties would exist in the population. The results of such a simulation are interesting.

In simulations involving very large populations (i.e. very high N), or those needing very few "winning mutations," the number of generations needed to get the correct mutations was less when a period without selection was permitted at the beginning. But once the number of compatible mutations needed to win was increased to six, the number of generations required for nearly all population sizes began to converge with the simulations where there was selection. They observed that when the number of "winning" mutations is about six, it doesn't really matter if there is a period of relaxed selection.

Real-World Simulations

Behe and Snoke first perform a number of hypothetical simulations to develop a method of modeling these processes. Then they turn to the biological literature to get some real-world numbers, and insert them into their model. The results are striking.

The literature indicates a mutation rate of about 1 mutation per 10^8 base pairs per generation. The rate at which genes duplicate is similar—about 1 duplication in 10^8 genes per year. Many organisms or parts of the genome might have different mutation rates, higher or lower, but current knowledge of genetics can allow for reasonable approximations.

What about the number of marbles that go into the bag from our hypothetical carnival game? In the game mentioned earlier, the bag contained 3 winning marbles and 2400 losing marbles. From the literature, Behe and Snoke find that for many cases, the ratio of winning to losing mutations is about 1 to 1000. Thus, if we were to use real-world numbers, Behe and Snoke suggest that our bag would contain about 3000 losing marbles, and 3 winning marbles. (They acknowledge this ratio might vary but note that there are factors which might pull it up or down.) Using these numbers, their results are portrayed in the figure below:

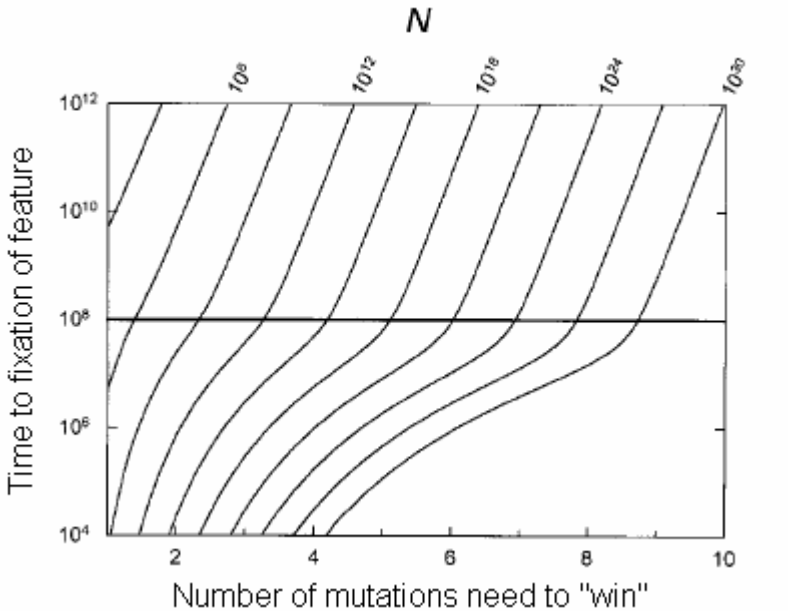


Figure slightly modified for use here. Used with permission.

This is figure 6 in Behe and Snoke's article. It plots the number of mutations needed to win (i.e. the minimum mutations needed to get the specified function) verses the time it takes, in generations, to get those mutations (without first killing the gene through deleterious mutations). Such a curve is plotted for various population sizes, labeled on the top axis. Above the line, the amount of time needed to get the lucky gene is unaffected by whether or not there is relaxed selection at the beginning of the simulation.

According to this diagram, to create a modestly complex protein-protein bond requiring six mutations, assuming a huge population size (i.e. 10^{22} organisms—many probabilistic resources) would still require 10^8 generations. For an average species with a generation time of one year, that's a hundred million years, making the evolution of a single protein-protein interaction a rare event in the history of life. Making such evolution more common, which could happen in a more reasonable amount of time (i.e. one million generations), would require 10^{30} organisms. Though there are perhaps about this many single-celled bacteria alive on earth today, 10^{30} far exceeds the probabilistic resources available for multicellular organisms. To simultaneously evolve the interactions of three proteins would require more organisms than have ever lived on earth.

Asking for six mutations isn't too unreasonable either. One recent study testing the evolution of the interaction of an amphioxis insulin receptor with a mammalian insulin receptor required seven mutations. According to Behe and Snoke, getting such an interaction within a hundred million generations would require over 10^{25} organisms.

Is evolution by gene duplication a likely mechanism? Their modest conclusion is that these results are "prohibitive:"

> "The lack of recombination in our model means it is most directly applicable to haploid, asexual organisms. Nonetheless, the results also impinge on the evolution of diploid sexual organisms. The fact that very large population sizes—10^9 or greater—are required to build even a minimal MR feature requiring two nucleotide alterations within 10^8 generations by the processes described in our model, and that enormous population sizes are required for more complex features or shorter times, seems to indicate that the mechanism of gene duplication and point mutation alone would be ineffective, at least for multicellular diploid species, because few multicellular species reach the required population sizes."

Other considerations and counterpoints

Good scientists don't just question the assumptions of others, they question their own assumptions. Behe and Snoke acknowledge that there are a number of good points which can be raised against their model.

Perhaps the first such objection is that they specified their winning mutations before they ran the simulation. In the real world, such winning mutations might not be specified, and the duplicate gene just searches out "protein-space" until it finds something useful. For this model, it means that even if the needed binding structure is pre-specified, other duplicated genes might also be capable of finding the final structure.

They also note that just because they have ruled out this particular pathway to creating biological structures, there may be other more plausible mechanisms. For example, they cite one pair of researchers who discuss the concept of "subfunctionalization," wherein a protein might be used to perform two functions within a cell. If the gene duplicates, one copy might be able to do the primary function, while the other becomes tightly tailored to perform the secondary function. Other mechanisms of transformation could include insertion and deletion of longer sequences of DNA into the genome. Perhaps these mechanisms will one day be amenable to closer scrutiny. For now, Behe and Snoke seem to have ruled out an important—and very commonly invoked—method of evolving biological complexity through gene duplication. If they are right, then, as Behe stated recently,[11] intelligent design may extend much deeper into the cell than previously thought.

Questions & Answers about IDEA's Mission Statement

By IDEA Center Staff

In late May, 2004, a controversy arose on some internet forums over the fact that the IDEA Center's mission statement has changed several times since our founding. It was alleged that we are an organization whose activities are primarily religious in nature, and that our interest in scientific questions is secondary at best. The IDEA Center would like to take this opportunity to clarify our position, respond to questions, and rebut some of the incorrect allegations.

The most serious of the charges can be reduced to this: In January of 2004, the IDEA Center removed from its mission statement a phrase stating that we believed the identity of the designer to be the God of the Bible. Some took this to imply that the Center was attempting to obscure a covert religious agenda. To address these claims, this article will address four questions:

1) What is the religious affiliation of the IDEA Center?
2) Has our mission statement ever changed?
3) Has the public characterization of our religious views changed?
4) To what extent is the IDEA Center a "religious" organization?

[11] As stated by Dr. Behe at a talk given at the Darwinism, Design, and Democracy V Conference in Albuquerque, NM.

1) What is the religious affiliation of the IDEA Center?

The leadership of the IDEA Center is composed of Christians who believe that the designer of the universe and of life is the God of the Bible. To understand why we acknowledge this affiliation, we must return to something we have long-called the "IDEA Philosophy." The IDEA Center's primary interest is in exploring and discussing intelligent design theory. ID is not dependent upon any religious premises. Why, then, would we want to inject our nonscientific "religious beliefs" into the conversation? This is because, at the core of the "IDEA philosophy," is the concept of admitting one's "bias." Since the founding of the original IDEA Club at UCSD, we have encouraged people to be open about their philosophical predispositions. We encourage others to admit their biases, and we want to set an example by doing so ourselves. We have always encouraged such on our website, and leadership of the IDEA Center has never shrunk from identifying the designer.

Everyone has a bias, whether they recognize it or not. At the IDEA Center, we spend most of our time focusing on scientific issues, but we want people to know our positions, both scientific and religious, in accordance with our founding philosophy. The effects of our bias upon the nature of our activities are minimal in that discussions relating to religious questions such as the identity of the designer are peripheral to our main focus of discussing scientific issues. But because we want to make it clear that we in fact have our own bias, we are explicit about our religious beliefs. Yet, in practice, IDEA Center activities are, for the most part, scientific in nature, which is appropriate since intelligent design is a purely scientific theory owing no allegiance to any particular religious doctrine.

Similarly to the IDEA Center, IDEA Clubs spend most of the time on scientific issues. However, another fundamental component of the IDEA philosophy is that "any question can be asked." IDEA Clubs deal primarily with scientific issues, but strictly speaking, they are not science classrooms. They are open discussion forums where our goal is to encourage all forms of dialogue (while remaining focused on science), and not to limit or stifle inquiry. Thus, we expect that questions or discussions about the identity of the designer may occasionally arise. Since these are fundamentally religious questions, and because the IDEA Center leadership share religious beliefs on this issue, we also require that IDEA Club leaders be Christians. By such a requirement, we achieve consistency in the IDEA Center and IDEA Club leadership, while welcoming club members of any philosophical persuasions.

As seen in our current mission statement, the IDEA Center believes there is empirical evidence supporting the conclusion that life was designed and that is how we promote ID theory. Although this theory may be consistent with our religious beliefs, it in no way relies upon them. The conclusion of design flows straightforwardly from the evidence. Questions about the identity of the designer, however, cannot be addressed via the data and scientific investigation. Thus, we believe that such questions belong to the province of religion.

Concerning what is permissible for debate at IDEA Clubs, we want to reemphasize that the Clubs are not science classrooms. Indeed, our position with respect to education is that discussions of the identity of the designer are <u>not</u> appropriate in a public school setting. To ensure that religion is not advocated, it is important for teachers to recognize that the identity of the designer is a religious topic, and, as such, inappropriate in a science classroom. ID theory does not purport to identify the designer because it is not a topic addressable by the data. Leading design theorist William Dembski makes this point explicitly:

> "Intelligent design is modest in what it attributes to the designing intelligence responsible for the specified complexity in nature. For instance, design theorists recognize that the nature, moral character and purposes of this intelligence lie beyond the competence of science and must be left to religion and philosophy."[12]

While a fundamentally religious topic such as the identity of the designer of life and the universe should be excluded from public school curricula, if handled properly, it could become an intriguing epistemological exercise. To demonstrate that the identity of a designer is beyond the reach of scientific knowledge, a teacher could explain that "the only commitment [of ID theory] is that the design in the world be empirically detectable" and that "this is not a matter of being vague but rather of not pretending to [have] knowledge that we don't

[12] William Dembski, (*The Design Revolution*, pg. 42)

have."[13] The teacher could then explain that science is a "particular way of knowing" where "[e]xplanations that cannot be based upon empirical evidence are not a part of science" because "[t]he statements of science are those that emerge from the application of human intelligence to data obtained from observation and experiment."[14] If science's methods of "knowing" cannot reveal the designer's identity, then this issue is simply beyond the scope of science. Students could be referred to their families or religious leaders for further inquiry into the identity of the designer, and encouraged to investigate other sources of knowledge, such as history or philosophy.

It should be mentioned that we are not making a value judgment between religious and scientific knowledge. We reject Stephen Jay Gould's "non-overlapping magisteria" (NOMA) model in which science and religion are completely separate realms, and which so often results in a diminished value of non-scientific knowledge. Scientific knowledge is NOT the only possible "way of knowing" but simply another, different, way. That said, it would be difficult to overstate the practical importance of science and its role in shaping our culture. For more on this topic, we highly recommend the article "Intelligent Design Theory and The Relationship Between Science and Religion", which is available online at ideacenter.org/contentmgr/showdetails.php/id/1130.

2) Has our mission statement ever changed?
It definitely has. Contrary to numerous reports by our detractors, this was not the result of an intricately plotted scheme by IDEA Center leadership to disguise our religious beliefs, but a reaction to the course of events and an attempt to clarify the aims of our fledgling organization. This is explained below

When the IDEA Center formed in 2001, it borrowed its mission statement entirely from that of the original IDEA Club at UCSD. Like the UCSD club, there was nothing in our mission statement affirming a particular religious viewpoint. Soon after our formation, IDEA Center leadership felt a desire to be more explicit about our "bias," such that our bias might be carried over into IDEA Clubs as well. Thus, beginning in early 2002, we included a phrase in our mission statement stating we "Hold, through other arguments, that the identity of the designer is the God of the Bible."

At the time of our first regular Board meeting in the summer of 2003, there was general agreement that the new addition to our mission statement could lead to confusion and obscure the scientific goals of the organization. The debate over ID and evolution is highly contentious and fraught with charges that intelligent design proponents are intent upon advancing their religious viewpoints at the expense of honest scientific inquiry. The IDEA Club at UCSD was founded by science majors who wanted to investigate scientific issues, and these core convictions were at the foundation of the IDEA Center as well. The IDEA Center's Board knew our organization was science-oriented, but concluded that well-intentioned statements of bias-disclosure in the mission statement might make people think we dealt primarily with religious questions. As a result, we felt it would be more effective, and less confusing, to put such statements elsewhere on our website, rather than in the mission statement. Accordingly, at the January, 2004 board meeting, we removed the statement about our religious beliefs from our mission statement.

Some who observed that our mission statement had changed attributed those changes to conspiracy, and theorized that we had evil or deceitful motives in doing so. Two basic options are available to explain our actions: a) We could have been engaged in a conspiracy to conceal our essentially religious motivation, or b) We might have been initially overeager to define ourselves and fell into the pit of confusion we were so anxious to avoid.

The answer is "b." After two years of operations, despite the fact that our original mission statement discussed our religious beliefs, we realized that we were spending so little time discussing religious beliefs, and we really didn't need to mention them in our mission statement after all. Indeed, we came to believe that this might be a source of confusion, indicating that we were equally focused on religion and science, when, in fact, science predominates in our activities. To unveil a supposed conspiracy, one must ask if we ever started concealing our "bias"

13 William Dembski, *Commentary on Eugenie Scott and Glenn Branch's "Guest Viewpoint: 'Intelligent design' Not Accepted by Most Scientists*, http://www.designinference.com/documents/2002.07.Scott_and_ Branch.htm (last visited July 12, 2004).
14 National Academy of Sciences, *Teaching Evolution and the Nature of Science* (National Academy Press 1998), 27. *See also* John A. Moore, *Science as a Way of Knowing*, 59-60.

after we changed the mission statement. The final two questions posed at the onset of this article will deal with this more directly.

Continuing our growing pains, at our final Board of Directors meeting in 2004, we revamped our mission statement once again after we realized our old one was inadequate. This mundane transaction will be specifically taken up in the next section.

3) Has the public characterization of our religious views changed?

If we had changed our mission statement to hide our religious beliefs, it seems obvious that we would not have engaged in further public disclosure of them. For all those conspiracy theorists out there, how can they explain that our website ALWAYS continued to explicitly mention the religious beliefs of the IDEA Center Leadership ***after*** the mission statement changed in January, 2004 to remove mention of our religious beliefs. Our continual disclosure of our religious beliefs is documented in the table below, as it has appeared on our website over time:

February, 2002 – August, 2002	"The group is run by Christians, and exists under the auspices of Faith Seminary, and has a Christian religious affiliation."
November, 2002 – April, 2004	"The group is run by Christians, and has a Christian religious affiliation."
April, 2004 – present	"The leadership of the IDEA Center are Christians, who believe that the identity of the designer is the God of the Bible."

Clearly, had we been attempting to be secretive about our religious convictions, we would have erased all mention of them from the website. From the inception of our organization we have held dear the value of admitting one's philosophical position. This is why the discussion of our religious beliefs was in our mission statement, and elsewhere on our website, in the first place. Consequently, when we removed the reference to religious faith from the mission statement, we did not feel the need to do so throughout the website. Assuredly, this would not be the way to protect our beliefs from becoming known.

4) To what extent is the IDEA Center a "religious" organization?

Allegations from our critics were essentially twofold:

1) Our activities are highly religious in nature
2) We were trying to hide our religious beliefs

In deciding how to respond, we of the IDEA Center leadership opted for a thorough and deliberate approach. In this way, we felt people could understand that our interests and activities are primarily scientific and only occasionally and briefly deal with religious questions. During this process, we came to believe that what we were writing as a response fit our goals better than our mission statement at the time! So, at our final 2004 Board of Directors meeting, the Board adopted a new mission statement—longer, but more precise than the original, which is reproduced in full in the highlighted box on page 12.

Conclusion:

As is evident, the IDEA Center has always been transparent about its "bias," with respect to our beliefs about the identity of the designer. This openness has remained constant, regardless of the fluctuating content during the refinement and evolution of our mission statement. The history of our organization reveals the very antithesis of secretive behavior. In fact, some prominent Darwinists have even commended us for being open about our beliefs. We've never been covert or deceitful about this. Our new mission statement is simply our latest attempt at clarity. We hope we have succeeded in that attempt. We take seriously the basic premise that intelligent design theory cannot identify the designer and that its function is merely to scientifically support the existence of design in nature. The IDEA Center aims to provide fora where that discipline can be explored.

To call us a "religious" organization, then, is simply a category mistake. The IDEA center is primarily an organization interested in scientific questions, although we are open that we do have religious beliefs about the identity of the designer.

Whatever label you want to use—"religious," "scientific," "hybrid," or "whatever," we hope after reading this article, you will understand us better. Thanks for reading!

Addendum: *This is not intended as a full rebuttal to the allegations made by some Darwinists on the internet. The purpose of this document is to bring clarity to their primary assertions. If you have futher questions, please contact us at info@ideacenter.org*

IDEA Center Mission Statement

(As of Fall, 2004)

- The IDEA Center is an educational non-profit organization which explores and discusses the topic of "origins" from a pro-intelligent design viewpoint, focusing primarily on the scientific issues and secondarily on the religious / philosophical implications found in any scientific theory which attempts to answer the question, "how did we get here?"

- Our activities will strive to create a warm, friendly, and open atmosphere of inquiry, dialogue, discussion, and debate in which participants of all viewpoints are respected, understood, and free to speak their personal views.

- We believe that in the investigation of intelligent design the identity of the designer is completely separate from the scientific theory of intelligent design, since a scientific theory cannot specify the identity of the designer based upon the empirical data or the scientific method alone, and is not dependent upon religious premises; nonetheless, we consider it reasonable to conclude that the designer may be identified as the God of the Bible, while recognizing that others may identify the designer in a different way.

- Our primary focus of outreach will be to help establish and help maintain Center-affiliated student-run IDEA Club chapters on school campuses. We also offer support to all individuals and organizations who desire to promote intelligent design theory regardless of their affiliation, be it scientific, philosophical, or religious.

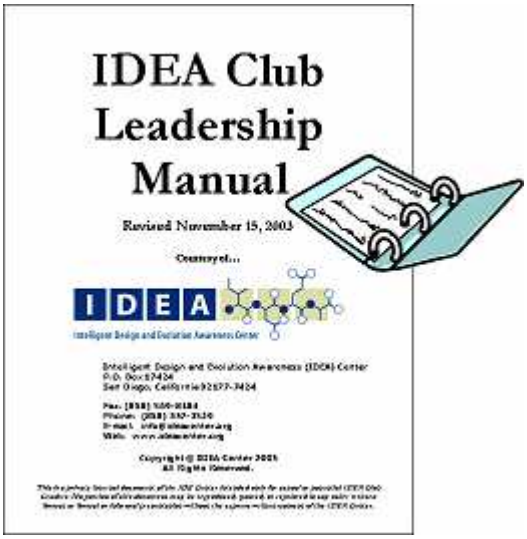
- At the heart of our advocacy is to promote intelligent design theory purely on its scientific merits. Our other advocacy goals include to challenge mechanistic and undirected scientific explanations for the origin and diversification of life, to challenge the philosophical assumptions underlying methodological naturalism, and as a final priority to explore the broader intersection of science, philosophy, education, and religion.

Improved IDEA Club Leadership Manual!

Every person who wants to form an IDEA Club, or becomes the leader of one, will receive an *IDEA Club Leadership Manual*. The manual is a "how-to" reference guide with tips and advice to help a prospective or current IDEA Club leader to deal with just about any situation that could arise. Topics covered in detail in the manual include:

- How to Start a Club
- Background on the IDEA Center
- How to Schedule Meetings and Choose Meeting Topics
- How to Start and Lead Discussions
- How to Handle Heated Meetings
- How to Create a Budget and Plan an Event
- How to Publicize Events and Meetings
- Creating a Website
- Promoting ID Amidst Critics with Love and Integrity
- Answering Common Objections to Design

If would like to request an *IDEA Club Leadership Manual* please contact Casey Luskin at casey@ideacenter.org for more information!



Please make me an IDEA Center Member:

☐ **General Member (free):** Receive free electronic semi-annual newsletter, and e-mail updates.

☐ **Complex Member ($25 donation):** Receive free biannual newsletter, e-mail updates.

☐ **Irreducibly Complex Member ($100 donation):** Receive free biannual newsletter, e-mail updates. Choose any one of these three items: 1) Free intelligent design video, 2) Free IDEA Center T-shirt, 3) Free IDEA Center Hat.

☐ **Sustaining Member ($500 donation):** Receive free biannual newsletter, e-mail updates, and annual IDEA Budget. Choose any two of these three items: 1) Free intelligent design video, 2) Free IDEA Center T-shirt, 3) Free IDEA Center Hat.

☐ **Founding Member ($1000+ donation):** Receive free biannual newsletter, e-mail updates, and annual IDEA Budget. Receive each of these three items: 1) Free intelligent design video, 2) Free official IDEA Center T-shirt, 3) Free official IDEA Center Hat. Additionally, receive an invitation to our annual Founder's Luncheon.

☐ **Order a T-shirt ($15 donation):** Please circle your preferred size: small medium large x-large

☐ **Order a Hat ($15 donation)**.

The IDEA Center is a 501(c)(3) non-profit organization capable of receiving tax-deductible donations. Please make any checks out to the "IDEA Center." Thank you for your support!

Name: _____

Occupation / Academic Affiliation: _____

Mailing Address: _____

Phone: _____ E-mail: _____

Please mail this form to:
IDEA Center / P.O. Box 17424 / San Diego, CA 92177