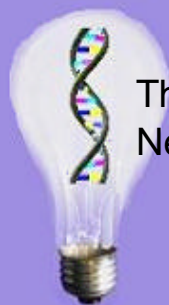
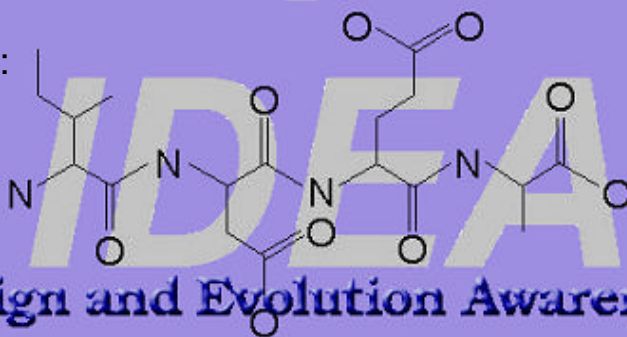


# The Light Bulb



The Biannual  
Newsletter of:



Volume II  
Issue 1  
Summer, 2003

Intelligent Design and Evolution Awareness (IDEA) Center

## Pseudogenes or Pseudoscience?

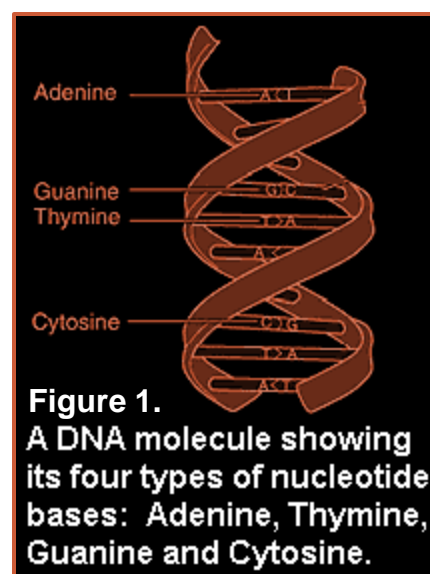
By Casey Luskin

***An up-to-date look at the debate over  
“junk-DNA” and “sub-optimal” design.***

### Introduction

When determining a feature topic for The Light Bulb, we often banter about what will most benefit readers. Though we may desire to devote newsletter space for writing articles in response to articles criticizing activities of the Center, the best newsletter covers topics of current interest that will serve readers. After a recent article in the eminent scientific journal *Nature* and articles in various intelligent design and creationist publications, the issue of “pseudogenes” and “junk-DNA” is a hot topic. Importantly, the scientific issues at stake in the debate over “pseudogenes” raise vital theological questions at the core of the intelligent design – evolution debate. First, however, a short biology lesson is in order.

Although the biochemistry of life is exceedingly complex, the basic processes by which the information of DNA (see Figure 1 at right) is converted into the



**Figure 1.**  
A DNA molecule showing  
its four types of nucleotide  
bases: Adenine, Thymine,  
Guanine and Cytosine.

biomatter of proteins can be summarized briefly. Genes are a portion of DNA which contain a sequence of nucleotides that code for a protein. A protein is a biomolecule composed of amino acids which performs some function in the cell. To make a long and elegant story short, the nucleotide language of DNA is “transcribed” into a similar molecule, messenger RNA (mRNA). Transfer RNA (tRNA), which carries amino acids, then binds to mRNA and the amino acids attached to the tRNA are linked, forming a protein. This process is called translation (see Figure 2 on page 2 for details).

This simple sounding process involves a host of other biomolecules that allow these fundamental biochemical processes to take place. It bears the marks of design if for no other reason than the fact that it contains many necessary parts which are fine-tuned to perform a specific function (see the “Quote Qua Quote” on page 6). But what happens when we encounter biomolecules that seem to perform no function? Therein lies this debate.

### Contents

#### Science Resources:

|  |       |
|--|-------|
| Feature: Pseudogenes or Pseudoscience? | Pg. 1 |
| Origins News Updates                   | Pg. 4 |
| “Quote Qua Quote”                      | Pg. 6 |

#### Field Reports:

|   |        |
|---|--------|
| IDEA Center News and Events                   | Pg. 3  |
| “Design vs. Darwin: A Scientific Controversy” | Pg. 5  |
| Radioheads Discuss Intelligent Design         | Pg. 10 |
| IDEA Club Spotlight                           | Pg. 10 |

#### Opportunities for Involvement:

|                                |        |
|--------------------------------|--------|
| IDEA Course <i>Reloaded</i>    | Pg. 11 |
| Think Again Conference         | Pg. 11 |
| Registration / Membership Form | Pg. 12 |

For more information, please visit:

**[www.ideacenter.org](http://www.ideacenter.org)**

IDEA Center Phone: (858) 337-3529  
P.O. Box 17424 Fax: (858) 569-8184  
San Diego, CA 92177 E-mail: [info@ideacenter.org](mailto:info@ideacenter.org)

## What is a Pseudogene?

"Pseudogenes" are portions of DNA which look like a normal gene but for some reason are not transcribed and translated into proteins. Pseudogenes may even have a similar DNA code to other known genes which biologists have already studied. The difference from "normal" genes is that pseudogenes are not "expressed" into proteins because of the presence of a "stop-codon" or other genetic marker preventing the biomolecular machinery of transcription and translation from converting all, or part of the pseudogene's DNA into a protein. Thus, to some eyes, "pseudogenes" appear to be "defective" copies of genes.

Pseudogenes have been called by some biologists a type of "junk-DNA," which is DNA that is thought to not perform any function. Ever since scientists began to understand the molecular biology of genetics, it became apparent that only about 3% of our DNA is genes that code for proteins. Many evolutionists assumed that the rest of 97% of "non-coding DNA" is "junk," a mere evolutionary relic of ancient discarded genes. Pseudogenes are said to be functionless stretches of "junk-DNA," which evolutionists use to make two claims:

- 1) Functionless "junk-DNA" is in itself evidence of a long evolutionary history of randomly duplicated genes that were shuffled, mutated, and discarded to sit there, performing no function today.
- 2) Not only is "junk-DNA" evidence of evolution, but it is evidence against intelligent design because an intelligent designer would not create functionless biomolecules like "junk-DNA."

In both cases, the validity of the evolutionists' argument is dependent on the DNA actually being functionless. Most often, the DNA is assumed to be functionless simply because no function has yet been directly discovered. But, as the old adage goes, absence of evidence does not equal evidence of absence. As our knowledge of biology explodes, perhaps our understanding of "junk-DNA" will change as well.

### Are pseudogenes really junk? Assessing Statement #1.

Thankfully, it is possible to indirectly test if a given piece of DNA might have a function. In organisms, mutations are always occurring at a constant rate. While "deleterious" or harmful mutations tend to get "selected out," most mutations are actually neutral: they do not have any ultimate effect upon the survivability of an organism. Natural selection is "blind" to such neutral mutations and so they accumulate at a constant rate. If pseudogenes truly are non-functional, then they should accumulate these neutral mutations at a constant rate, since the pseudogene can mutate without having any repercussions for survival.

This prediction was tested over ten years ago. A study analyzed the DNA sequence of a pseudogene shared by humans, chimpanzees, orangutans, gorillas, and Old World monkeys, such as the baboon. As might be expected, genes vital to survival in these species show little variability, because they must perform a specific function. Conversely, functionless "pseudogenes" which should have no bearing on survival, should have no unexpectedly high levels of similarity because neutral mutations should have accumulated in them since the species supposedly diverged some 30 million years ago. Yet, this study found that a certain pseudogene had half as many differences among the primates as it should if they were constantly accumulating neutral mutations! The high level of similarity implies that this pseudogene performs some yet-unknown function in the cell. This type of evidence, however, is merely a "smoking gun" and not direct evidence of pseudogene functionality.

Yet, just this past year, UCSD and Japanese researchers did find direct evidence for functionality of a pseudogene in a mouse. A *Nature* story stated that evolution has led researchers to believe that "[p]seudogenes' are produced from functional genes during evolution, and are thought to be simply molecular fossils." Though the supposed lack of function of pseudogenes causes them to be commonly cited as supposed evolutionary relics that are evidence for common ancestry, the article continued that, "[t]he unexpected discovery of a biological function for one pseudogene challenges that popular belief." This "pseudogene" apparently regulates mRNA on a different chromosome.

Up to this point, evolutionists had assumed that pseudogenes were non-functional because of the predictions (statement #1, above) of evolution. The prediction had discouraged what could have been promising biological research into the role of pseudogenes. The article ends with a profound question that both evolutionists and design theorists ought to take seriously: "Might the pseudogene copies of other functional genes be similarly useful?"

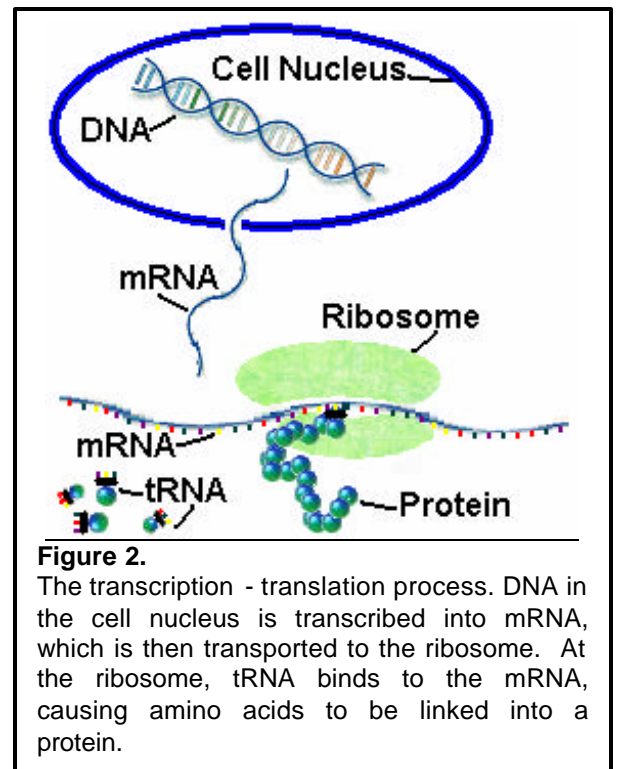


Figure 2.

The transcription - translation process. DNA in the cell nucleus is transcribed into mRNA, which is then transported to the ribosome. At the ribosome, tRNA binds to the mRNA, causing amino acids to be linked into a protein.

# IDEA Center News and Events:

## No upcoming IDEA Conferences? Think Again!

On July 26<sup>th</sup>, 2003, the IDEA Center is co-sponsoring the "Think Again: Intelligent Design in the Universe" conference at Carlsbad Community Church. Keynote speakers include author and intelligent design biochemist Michael Behe, philosopher J.P. Moreland, and theologian H. Wayne House. For more information, including how to register, please see page 11 and 12 or visit the Conference website <http://www.ideacenter.org/thinkagain/>.

## IDEA Course Reloaded to Begin September, 2003

The IDEA Course *Reloaded* will be the second IDEA Course of 2003. This ten-week course on intelligent design theory and creation - evolution issues will be taught by Center staff and Faith Seminary faculty. For more details about the class, please see page 11 or visit the class website at <http://www.ideacenter.org/idclass.htm>.

## Center Welcomes Two new staff members

We heartily welcome two new staff members: Geneve Huxley and Joanna Maurer. Geneve Huxley is a certified public accountant and will serve as our Chief Financial Officer. (She is also the sister of staffer Ryan Huxley, but we won't hold that against her). Joanna Maurer, our new Director of Development, is an attorney who has worked extensively in fundraising in the UC system.

## IDEA Club Chapter Updates

Since the inception of the Center almost 2 years ago, 7 IDEA Clubs have been founded. This past school year there were 6 active chapters. Here are some highlights:

- The IDEA Club at the University of Texas, Dallas hosted a few meetings, including 2 videos with discussions and has begun to build membership.
- Now in its 4<sup>th</sup> year, the IDEA Club at the UC San Diego hosted a Roundtable Discussion on objections to intelligent design that drew over 25 students from all sides of the debate. They also composed an extensive rebuttal to an ID-skeptic at UCSD at: <http://www-ac.s.ucsd.edu/~idea/stasisobj.htm>.
- The Vanderbilt IDEA Club hosted an event featuring an evolutionary biology professor discussing ID.
- IDEA Club at Long Beach City College hosted a video night and discussion.
- The IDEA Club at Baraboo, Wisconsin has shown over 8 different videos and built a strong membership at its monthly meetings. They plan to participate in the county fair, and helped create excellent T-shirts for the Center! See Spotlight page 10.
- The IDEA Club at Cal State Sacramento discussed the "icons of evolution" and engaged a CSUS evolution class through their fliers. They are in a membership-building phase, but

managed to attract a fair number of new students to the club by the year's end.

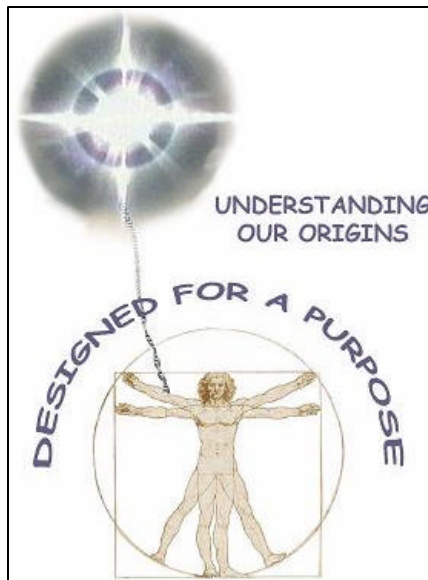
- A new chapter is also forming at the University of Oklahoma. Their leadership is already established, and we are excited about this club!

We're always looking for students or others interested in starting IDEA clubs. For more information, please contact us at [info@ideacenter.org](mailto:info@ideacenter.org).

## Any Publicity is...

Here's the latest that people are saying about the Center:

- The IDEA Conference 2002 was reviewed in *Reports of the National Center for Science Education* (RNCSE) in their Nov/Dec, 2002 and Jan/Feb 2003 issues. The reports were highly critical of the conference for its content and made numerous attempts to discredit the qualifications of speakers and de-emphasize conference successes. However, as they say in advertising, "Any publicity is good publicity."
- An article about the IDEA Conference 2002, "Intelligent design debate becomes personal," was also published in the December 2002 issue of *Research News and Opportunities in Science and Theology*. Authored by co-president Casey Luskin, the article detailed the debate during the panel discussion between conference speakers Jay Wesley Richards and Paul Nelson and NCSE director Eugenie Scott. A letter-to-the-editor exchange between Scott and Luskin ensued in the April, 2003 issue.
- Another article, "The World as Mousetrap," was written about the IDEA Conference in the December, 2002 issue of *San Francisco Faith*, a Catholic magazine. Author Joe Marti praised the conference for its support of academic freedom and showed a strong support among some Catholics for intelligent design theory.
- Staff members Ryan Huxley, Casey Luskin, and Scott Uminsky were on the air with Michael Law during "The Grapevine" on KPRZ 1210 am from November 11<sup>th</sup> - 13<sup>th</sup> 2002 discussing the Intelligent Design Debate at Hillsdale College. See page 10 for a full report.
- The Center has been referenced in Breakpoint Articles by Chuck Colson and Phillip Johnson, including, "Intelligent Design, Freedom, and Education" (5/9/03).



## Intelligent Design: Wear it out!

Tired of trendy, overpriced clothes, that are *un*-intelligently designed to look worn, old, and tattered? Shop no more: IDEA Center t-shirts are in! Thanks to Ralph Krainik, founder of the IDEA Club at Baraboo, WI, the T-shirts promote awareness of intelligent design and inform people about the Center. To help cover costs and raise funds, we request a \$15 donation per shirt. The back design (at left) features Leonardo Da Vinci's "Vitruvian Man," designed through binary code and DNA. The IDEA Center website is listed on both sides. To order yours, please e-mail us at [info@ideacenter.org](mailto:info@ideacenter.org) or see the form on page 12.



## Brief Origins News Updates:

**Monkeying Around:** In evolution – creation lore, prominent British evolutionist and agnostic, Thomas Huxley, once challenged that given enough time, six monkeys on typewriters could produce the works of Shakespeare. A recent CBS News article, “Monkey Theory Proven Wrong,” reports that British scientists who left a functioning computer in a monkey enclosure found that before urinating and defecating on the keyboard, “the lead male got a stone and started bashing ... it.”<sup>1</sup> Some of the more scholastically inclined eventually produced 5 pages of text, “primarily of the letter S.”<sup>1</sup> Shakespeare may have to keep waiting.

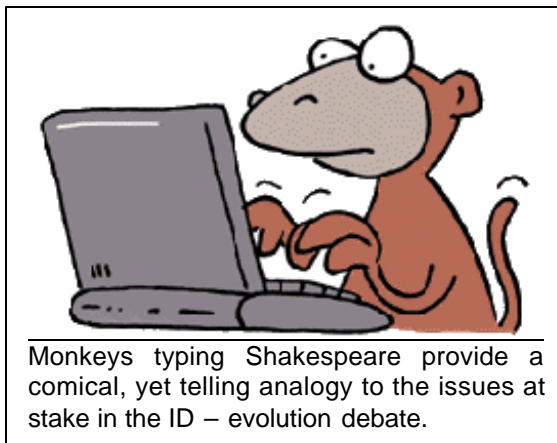
**Chimps 'n Humans II:** Previously we reported that the commonly cited 98% similarity statistic for human and chimpanzee DNA is actually closer to 95%. Another study reported that differences between the human and chimp genomes are much larger when one considers insertions and deletions (“indels”).<sup>2</sup> The authors stated, “our perceived sequence divergence of only 1% between these two species appears to be erroneous, because this work [...] puts both species much further apart.”<sup>3</sup>

**Trashing Junk DNA, Part III:** “Junk-DNA” is looking less and less junky. In addition to the functional pseudogene<sup>4</sup> discussed in the feature article, other notes include:

1. Authors of a *Nature* paper who sequenced the mouse genome found that 3% of non-coding portions of the mouse and human genomes are similar, indicating functionality.<sup>5</sup> This means that there is more functional non-coding DNA than coding DNA! Authors speculated that non-coding DNA may regulate other genes. One leading author said, “My goodness, there’s lot more that matters in the human genome than we had realized.”<sup>6</sup>
2. The New York times reports that “huge stretches of DNA that do not contain protein-coding genes and have been considered ‘junk’ actually code for ... RNA”<sup>7</sup> which plays a large role in gene regulation.
3. A study by Harvard microbiologists found that as much as 20% of introns (non-coding DNA inside of a gene) in plants, animals, and fungi are found at similar chromosomal loci.<sup>8</sup> Under evolution, this implies these introns persisted at similar locations for hundreds of millions of years, which is extremely unlikely if these

non-coding introns are purely functionless and randomly inserted pieces of “junk-DNA.”

**Fruit Flies in Darwin’s Ointment:** A research study looking at the ability of fruit flies to evolve resistance to severe environmental changes found that fruit fly populations subject to “intense selection for over 30 generations” “[lack] the ability to evolve further resistance.”<sup>9</sup> This seems to imply that even under extreme “selection pressure,” there are inherent genetic limits to the amount of change possible in an organism.



**Genes Planted by Design?** A paper shows that similar genes appear in plant species which evolutionists believe are distantly-related, implying they were not inherited through common

descent.<sup>10</sup> To preserve evolution, evolutionists say that bacteria took genes from one plant and inserted them into another, thus explaining the presence of the same gene in “distantly-related” species, but not “closely-related” ones. The details are vague, but it is the only “epicycle” to keep the genomic evidence from unequivocally pointing towards common design of similar genes in unrelated organisms.

**NCSE Produces “Project Steve:”** The National Center for Science Education has produced “a tongue-in-cheek parody of a long-standing creationist tradition of amassing lists of ‘scientists who doubt evolution’ or ‘scientists who dissent from Darwinism’”<sup>11</sup> by compiling a list of “Steve’s,” “Stephens,” “Stephanies” etc. that support evolution. Though witty, the project has deeper implications. The Director of the NCSE, Eugenie Scott, has said that science is not a democracy, and that numbers or popularity contests do not decide what is right. ID proponents agree, for they do not “amass” such lists to imply that macroevolution is therefore false. Rather, ID proponents are merely trying to rebut the fallacious counter-argument that Darwinists use when they argue, “No scientists doubt evolution, therefore only evolution should be taught.” Just as the NCSE would agree, this argument is fallacious because popularity contests—even among scientists—should not decide what is true. ID proponents only wish to show that scientists do support our side, and then allow the evidence—not a list of scientists—speak for the truth itself. Only a fair presentation of evidence can allow the truth to be revealed.



**References:** 1. “Monkey Theory Proven Wrong” by Brian Bernbaum in *CBS News* at <http://www.arn.org/docs2/news/monkeysandtypewriters051103.htm> (May 9, 2003). 2. “Comparative sequencing of human and chimpanzee MHC class I regions unveils insertions/deletions as the major path to genomic divergence” by T. Anzai *et al.* in *PNAS* 100:7708-7713 (June 24, 2003). 3. “Driving man and chimp apart” by Cathy Holding in *The Scientist* at <http://www.biomedcentral.com/news/20030626/01> (June 26, 2003). 4. “An expressed pseudogene regulates the messenger-RNA stability of its homologous coding gene” by S. Hirotsune *et al.* in *Nature* 423:91-96 (May 1, 2003). 5. “Initial sequencing and comparative analysis of the mouse genome” by A. T. Chinwalla *et al.* in *Nature* 420:520-562 (December 5, 2002). 6. Dr. Eric Lander as quoted in “Junk DNA’ Contains Essential Information” by Justin Gillis in *The Washington Post* at <http://www.washingtonpost.com/wp-dyn/articles/A9055-2002Dec4.html> (December 4, 2002). 7. “RNA Trades Bit Part for Starring Role in the Cell” by Andrew Pollack in *The New York Times* at <http://www.nytimes.com/2003/01/21/science/21RNA.html> (January 21, 2003). 8. “Large-scale comparison of intron positions among animal, plant, and fungal genes” by A. Fedorov *et al.* in *PNAS Early Edition*, 10.1073/pnas.242624899 at <http://www.pnas.org/cgi/content/abstract/242624899v1> (October 15, 2002). 9. “Low Potential for Climatic Stress Adaptation in a Rainforest *Drosophila* Species” by A. A. Hoffmann *et al.* in *Science* 301:100-102 (July 4, 2003). 10. “Widespread horizontal transfer of mitochondrial genes in flowering plants” by U. Bergthorsson *et al.* in *Nature* 424:197-201 (July 10, 2003). 11. Information about “Project Steve” can be found on the NCSE website at <http://www.ncseweb.org/>.

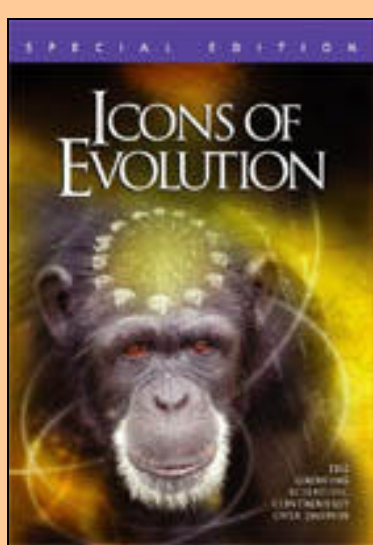
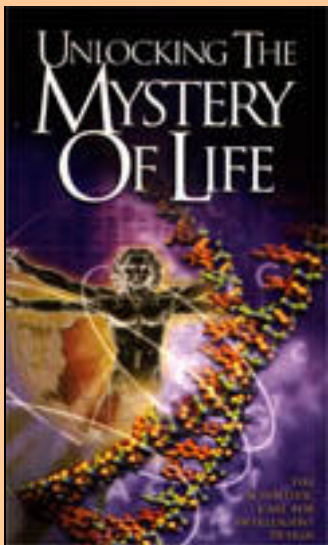
# Design vs. Darwin: A Scientific Controversy

By Ryan Huxley & Casey Luskin

This May the IDEA Center supported a public showing of two intelligent design videos at the “Design vs. Darwin: A Scientific Controversy” series. The series introduced San Francisco Bay Area locals to intelligent design (ID) theory and problems with the theory of evolution through two excellent videos: *Unlocking the Mystery of Life* and *Icons of Evolution* (see below). The videos were followed by a speakers panel which included biochemist Dr. Robert Baffi, physicist Dr. Bert Massie, Professor Stephen J. Huxley of the University of San Francisco, and Dr. Joanne Salcido, also a biochemist. Additionally, the panel included the IDEA Center’s own Ryan Huxley.



“Design vs. Darwin: A Scientific Controversy” Speakers’ Panel on May 8, 2003.



These videos -- *Unlocking the Mystery of Life* and *Icons of Evolution* -- are excellent teaching tools for presenting evidence for intelligent design and problems with evolution.

*Unlocking the Mystery of Life* is a stunning presentation of intelligent design theory through computer graphics and interviews with scientists in the intelligent design movement.

*Icons of Evolution* is a documentary based on the true story of a high school biology teacher who was “reassigned” after using mainstream articles to teach problems with common lines of evidence used to support evolution—the “icons.”

These tools are so effective that we provide free copies to all IDEA Club chapters because of their quality, content, and ability to communicate important information. To purchase, we recommend you visit Access Research Network online store at <http://www.arn.org/arnproducts/vidinfo.htm>

On the first night, after a crowd of about 225 viewed *Unlocking the Mystery of Life*, Dr. Massie discussed comments made by prominent pro-evolution scientists. Massie noted that the creation-evolution debate is actually a cultural war in which science is often co-opted to support philosophical naturalism under the guise of evolutionary science. However, Massie encouraged listeners not be sidetracked by the worldviews that may clash in the debate. Attention should be focused on the scientific observations and what insights those observations provide. Dr. Massie believes there is evidence for design in all areas of science, but as a physicist he observed that biology seems to be particularly opposed to ID. Massie suggested ID is appropriate to be taught in schools because no supernatural claims are made about the designer.

The second evening saw about 140 people view *Icons of Evolution*, a documentary including scientific critiques of many of the popular “icons” used to support evolution. Following the video, Dr. Baffi presented on what he thought Darwin might think about ID if he were alive today and had the benefits of our understanding of molecular biology. Dr. Baffi noted that “Implicit in life is control. Regardless of its level of organizational complexity, no living system can exist without precise mechanisms for controlling its activities. These show all the hallmarks of Intelligent Design.” Dr. Baffi cited a schematic of the Krebs’ Cycle control in a cell (See page 6).

Dr. Baffi concluded saying that though some still consider a reaction between a mix of random chemicals a plausible means for the origin of life, he believes that “It is a romantic notion to believe that out of the primordial soup of the oceans random chemical reactions resulted in the organization of information, structure and function to the extent that exists within living systems.” Dr. Baffi made the important point that “Control systems utilized by all living systems are extremely complex and sophisticated and are indicative of Intelligent Design.”

Dr. Baffi offered the following quote describing how shifts in scientific thought take place:

There is a complicated hypothesis which usually entails an element of mystery and several unnecessary assumptions. This is opposed by a more simple explanation which contains no unnecessary assumptions. The complicated one is always the popular one at first, but the simpler one, as a rule, eventually is found to be correct. This process frequently requires 10 to 20 years. The reason for this long time lag was explained by Max Planck. He remarked that 'Scientists never change their minds, but eventually die.'

J.H. Northrop

Following Dr. Baffi was a discussion of the underlying metaphysical premises behind many pro-evolution arguments. Many early evolutionists promoted their theory not necessarily through scientific evidence for evolution, but rather through negative theological claims of what God would or would not have created. One such example comes from Darwin himself, who wrote:

I cannot persuade myself that a beneficent and omnipotent God would have designedly created the Ichneumonidae [a large family of parasitic wasps] with the express intention of their feeding within the living bodies of caterpillars.

Such arguments are based upon the *personal views* of these evolutionists, and are theological, rather than scientific. In other words, such arguments are actually based upon metaphysical claims that are not open to scientific inquiry. This method of argumentation is also exemplified by noted evolutionist paleontologist, the late Stephen J. Gould:

Orchids manufacture their intricate devices from the common components of ordinary flowers, parts usually fitted for very different functions. If God had designed a beautiful machine to reflect his wisdom and power, surely he would not have used a collection of parts generally fashioned for other purposes. Orchids were not made by an ideal engineer; they are jury-rigged from a limited set of available components. Thus, they must have evolved from ordinary flowers.


Stephen J. Gould (emphasis added)

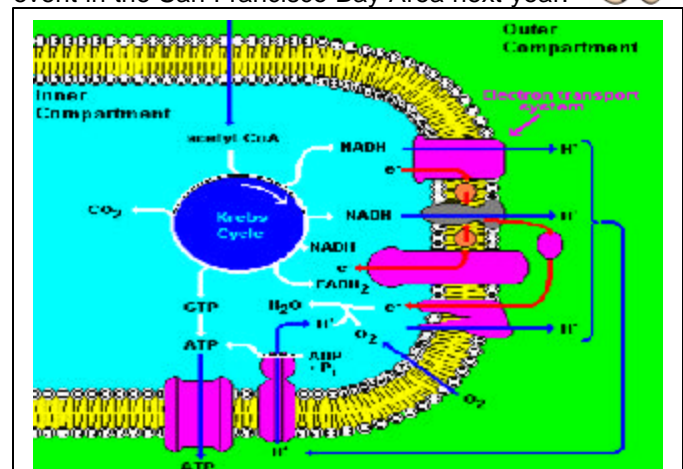
When confronted with such theological objections, it is appropriate to give a theological answer. The IDEA Center has found it helpful to respond with a theological discussion of the Biblical answer to the "problem of evil."

See "Pseudogenes and Pseudoscience" article (page 7) for more information.

On the second evening, Ryan Huxley was asked during the panel discussion why punctuated equilibrium (PE) was not offered as a viable revision to the traditional gradualism of evolutionary theory. Ryan noted that while PE is consistent with the fossil record (i.e. it acknowledges gaps), the rapid rate of change required seems inconsistent with population genetics. Evolutionist paleontologist Steven M. Stanley recognizes this regarding whale evolution:

Given a simple little rodent like animal as our starting point, what does it mean to form a bat in less than ten million years, or a whale in little more time ... If an average chronospecies lasts nearly a million years ... then we have only ten or fifteen chronospecies to align, end-to-end, to form a continuous lineage connecting our primitive little mammal with a bat or a whale. This is clearly preposterous ... A chain of ten or fifteen of these might move us from one small rodent like form to a slightly different one ... but not to a bat or a whale!

This two-evening event was successful and even spurred a local high school student to write a speech on ID for a class. There has been discussion of having another similar event in the San Francisco Bay Area next year. 



The KREBS Cycle is a process whereby energy is created for the cell to use. This 10-step process is fundamental to all life, and bears the hallmark information content of intelligent design.

## Quote Qua Quote

It's nice to talk about replicating DNA molecules arising in a soupy sea, but in modern cells this replication requires the presence of suitable enzymes. Furthermore, DNA by itself accomplishes nothing. Its only reason for existence is the information that it carries and that is used in the production of a protein enzyme. At the moment, the link between DNA and the enzyme is a highly complex one, involving RNA and an enzyme for its synthesis on a DNA template; ribosomes; enzymes to activate the amino acids; and transfer-RNA molecules. Yet selection only acts upon phenotypes and not upon the genes. At this level, the phenotype is the enzyme itself. How, in the absence of the final enzyme, could selection act upon DNA and all the mechanisms for replicating it? It's as though everything must happen at once: the entire system must come into being as one unit, or it is worthless. There may well be ways out of this dilemma, but I don't see them at the moment.

Frank B. Salisbury, "Doubts about the Modern Synthetic Theory of Evolution," *American Biology Teacher*, Sept. 1971, pg. 338.

**Continued from Page 2**

Thus, it appears that for pseudogenes, research is now beginning to uncover that they may indeed have a function, indicating that statement #1 is false: pseudogenes are not clear evidence of a long evolutionary history producing useless genetic junk, as they may play an important role in the cell. Evolutionary expectations may have slowed acceptance of this idea, but some prominent mainstream scientists are beginning to agree.

For example, this past June 10, leading evolutionist and origins of life researcher Gerald Joyce stated in a talk at UC San Diego that he believes that “junk-DNA” really codes for an RNA-based “secret society” that is a vital part of our metabolism. Joyce believes the concept of “junk-DNA” to be essentially obsolete. Given that Joyce is an expert and runs a large lab devoted to the study of RNA, his voice and unique perspective on these matters ought to be taken seriously.

**Would a designer create “Sub-optimal Design?” Assessing Statement #2.**

The second statement claims that, “an intelligent designer would *never* create functionless biomolecules like “junk-DNA.” This claim is more difficult to empirically assess because it deals with the less scientific question of, “would, or what wouldn’t a designer produce?”

In science, theories are confirmed or disconfirmed comparing the data to predictions that the theory makes. A prediction of a scientific theory must be generally true for the theory under all circumstances, such that it can be confirmed through repeated experimentation by any scientist. In intelligent design theory, some claims about what designers produce are true in all circumstances, but some are not. In other words, there are some characteristics of designers which are universal among all possible intelligent agents, and some characteristics which are particular to only a subset of intelligent agents. Although it is clear that specified complexity is always the product of design, because designers may act with intentions unknown to us, it can sometimes be difficult to make broad scientific claims about what a designer would or would not produce in all situations. Such non-universal claims about what a designer would or would *not* create something enter us into the realm of theology and philosophy. To assess whether a claim about a designer is philosophical or scientific, we must turn to philosophy.

The Greek philosopher Aristotle realized that we can explain the origin of any object or entity through various “levels” of causation. Often called Aristotle’s “four causes,” these ideas have been the bedrock of introductory philosophy courses for the past 2000 years. A brief look at these four causes will help show how they are relevant to this discussion.

**Final Cause:** Final causes are the ultimate purpose for the existence of something. The final cause asks “what is a thing’s meaning or reason for existence in the grand scope of reality?” For example, if we ask, “why are there chairs?” the final cause would be “because people need something to sit in.” In the case of chairs, their final cause is not necessarily moral or religious, however final causes very often are of a moral or religious nature. For example, if you ask a Christian, “Why do humans exist?,” the traditional answer is “To know God personally and glorify Him.” Final causes thus can have strong moral and religious implications, as they tend to account for a metaphysical reason for existence.

**Efficient Cause:** The efficient cause is the mechanism or method by which something is created—the “how.” Returning to the chair example, the efficient cause of a chair might be a woodworker. The efficient cause has great importance in the intelligent design - evolution debate, which is essentially a debate over the efficient cause of life—“*how* did life arise?” Evolutionists, even theistic evolutionists, would claim that our efficient cause is the Darwinian mechanism—mutation and selection. In contrast, design theorists claim our efficient cause is some combination of intelligent design and evolution (microevolution). Questions about the efficient cause thus look to universal predictions of the two theories which allow us to determine which mechanism was involved in the production of a biological structure.

| Type of Cause   | Nature of Cause   | Type of Objection to ID |
|-----------------|---|-------------------------|
| Final Cause     | Moral or religious reason for the existence of a thing. | Theological             |
| Efficient Cause | The mechanism or method by which a thing is created.    | Scientific              |
| Formal Cause    | Essence, structure, or building design of a thing.      | N/A                     |
| Material Cause  | The matter of which a thing is composed.                | N/A                     |

**Formal and Material Cause:** These lower levels of causation are less important here. Formal causes ask about the pattern, essence, or physical structure of a thing. The formal cause of a chair is the shape into which it is made so people can sit in it. The formal cause of a human is more complicated, and would include our physical, mental, emotional, and spiritual construction. A material cause is the physical matter from which a thing is made. Thus, the material cause of a chair could be wood, or plastic. More specifically, it could be atoms and molecules. A human’s material cause would be cells, proteins, and biomolecules, etc.

In assessing the claim “a designer wouldn’t design...” we must determine a claim is against a final cause or an efficient cause. Objections to final causes, the moral or religious reason something exists, lie outside of the realm of science. These theological objections can be answered through theological explanations, and are not relevant questions for the science of intelligent design. However, some objections could deal with the efficient cause. Let’s try to distinguish between the two.

## Distinguishing between “Final” and “Efficient” Objections to Design

At the Hillsdale College Intelligent Design debate (see page 10), Darwinist philosopher Michael Ruse objected to intelligent design because he claimed a designer would not create people with the disease sickle-cell anemia. At first glance, this appears a moral objection, saying that morally speaking, a designer would not create people with diseases. Such an objection would be a clear example of the “problem of evil” objection. This age-old objection states that a kind, loving, all-powerful God would not create a world with disease, pain, and other evil characteristics (such as red lights and moldy bread). This is clearly an objection that deals with the final cause, as it asks, “why, in the moral sense, would a designer create?”

The science of intelligent design theory quickly disposes with such moral objections through the simple observation that even things with an evil moral purpose can be intelligently designed. Torture chambers and electric chairs, terrible as they may be, are full complex specified information. Though some designers do not create evil, such as the God of the Bible, such a claim is not true for all designers in general, and thus does not attack the scientific theory of intelligent design. This shows how questions about final causes are not typically applicable to the science of intelligent design theory, because designers can create for a variety of different metaphysical reasons, though their products are still designed. Having addressed the scientific issue, such theological objections still beg for theological answers.

Most religions attempt to provide solutions to the problem of evil at some level. Volumes have been written by religious commentators on this subject, as coping with evil is a fundamental struggle with which all human beings must contend. We all lose loved ones, we all experience pain and loss. In writing an intellectual explanation for the “problem of evil” Christian author C.S. Lewis prefaced his discussion saying:

[T]he only purpose of the book is to solve the intellectual problem raised by suffering; for the far higher task of teaching forgiveness and patience I was never bold enough to suppose myself qualified, nor have I anything to offer my readers except my conviction that when pain is to be borne, a little courage helps more than knowledge, a little human sympathy more than much courage, and the least tincture of the love of God more than all.

Lewis drives at the crucial human element involved in all discussions of the “problem of evil,” but there is still the intellectual side. Harsh though it may seem, many philosophers believe there is no logical conflict between believing in an all-powerful and all-loving God and accepting the existence of evil in the world. Famous Oxford philosopher Richard Swinburne wrote, “It seems to be generally agreed by atheists as well as theists that what is called ‘the logical problem of evil’ has been eliminated, and all that remains is ‘the evidential problem.’” In other words, the problem can be solved, but it is sometimes difficult to accept.

Christianity solves the “problem” by explaining that evil is ultimately not the fault of God, but rather is the result of human sin and the sin of evil spiritual beings. Both groups have rebelled against God, who is fundamentally loving and good. God thus did not create the physical or spiritual world full of evil, but His creations, in their own free will, chose evil. Additionally, though the world chose evil, Christianity teaches that God has redeemed it from evil. An analogy is that humanity was on a boat with God, and it was safe, dry, and happy. Humanity chose to jump off the boat into the swirling ocean, incurring the consequence of imminent drowning. Yet, while drowning in this ocean of evil, God in His mercy has thrown us a life-ring, Jesus Christ, if we choose to grab on to him. This is the essence of the Christian solution to the problem of evil.

Though it is easy to dispense with moral objections such as the one made by Ruse, there is another form that is less blatantly theological. Ruse objected that God would not create disease. While Ruse may have been arguing that God would not morally create the evils of disease, another possibility is that Ruse is simply claiming that as far as designing an organism is concerned, it is sub-optimal design to produce something that easily might die. Thus, Ruse might say, we would not expect any designer to create something which functions below the optimal level. This objection hits closer to the efficient cause, because a firm statement can be made that designers tend to create things that are functional. A similar objection was made by Stephen J. Gould, saying that the “panda’s thumb” is poorly designed to grasp the bamboo upon which pandas feed. Phillip Johnson describes the crux of such arguments:

‘The Panda’s Thumb,’ relies on a few selected examples and a spectacularly shallow theology to establish the ‘fact of evolution’ ... Gould thinks that a supernatural designer could have found a more elegant solution to the panda’s need for an efficient bamboo stripping tool; therefore the thumb is not designed; therefore it is the product of evolution.

Johnson points out that even when arguing the design is “sub-optimal,” one is still making a theological objection about the intention of the designer, and assuming that a designer must create something with 100% energetically efficiency. This objection is also theological because all designers may not intend for all aspects of their designs to perform at the highest possible levels. My state-of-the art laptop must recharge its batteries once every 3 hours. I’d like it to never need recharging. Heck, I’d like to be able to type 2000 words per minute, fly like a bird, and be able to have fried-egg sandwiches every day without having to fear a heart attack. But just because I could have been designed to do certain things “better” or more energetically efficient does not mean that I was not designed to perform the functions I can perform. Once again, this issue

**The science of intelligent design theory quickly disposes with moral objections through the simple observation that even things with an evil moral purpose can be intelligently designed. Torture chambers and electric chairs, terrible as they may be, are full complex specified information ... Having addressed the scientific issue, such theological objections still beg for theological answers.**

has boiled down to the "problem-of-evil" argument stating that an all-knowing, all-loving, all-powerful God (i.e. the Designer) cannot coexist with evil (i.e. sub-optimality). This is a theological objection, for such "flaws" or "imperfections" may ultimately have moral causes (remember the Biblical cause of evil in the world). However this objection can be resolved scientifically by showing that engineers are often forced into compromises in functionality when designing, and that they do not always have pure energetic efficiency in mind when they design.

Every engineer realizes that when designing a machine, one must act within design constraints. Sometimes one aspect of the functionality of a machine must be compromised in order to allow for another more crucial design parameter to be met. The final result is a machine that has overall optimal design, though perhaps functioning at a lower than possible level of performance with regards to some particular aspect of functionality.

At the scientific level, "sub-optimal design" can also be explained because designers may not intend for certain aspects of the design to operate at 100% energetic efficiency. This objection really gets at the final cause of why in the grand sense something is the way it is. Operating at less than 100% energetic efficiency does not address the question of the efficient cause, because there are many plausible reasons for why intelligent design might produce less than 100% optimal functionality with regards to all aspects of performance. Finally, this really is no different from the problem of evil objection. All one is really objecting to is the pain or deficiencies (i.e. evil) caused by the design, and assumes that the designer must never allow for such deficiencies. Indeed, genetics has revealed that we are even programmed to die! Indeed, unfortunately, many individuals with many diseases face a shortened lifespan. Does that mean we were not designed? Perhaps we were intelligently designed to die because it was not a part of the designer's final reason for creating us that we should live in these physical bodies forever. One might think that the designer is therefore cruel, but remembering that this is a theological issue, it can be pointed out that Christianity explains how "evil" in the world is ultimately not the fault of God. Objections pointing out "sub-optimality" do not address the scientific question of evolution vs. design.

### **Non-functional Design**


There is one thing that a designer would always be expected to produce in all circumstances: functionality. Thus, while something may be purposefully designed to not function at 100% energetic efficiency, designed objects are designed to function in some way, period. Thus, for all intents and purposes, functionality can be taken as a scientific prediction of intelligent design theory because observations of known designers in all circumstances reveal that they design everything for the purpose of fulfilling some function. Questions about functionality are thus questions which can tell us about the efficient cause and are thus scientifically relevant.

Though sometimes the functional purpose may be difficult to determine, for the sake of biological investigations, it seems fair to accept that non-functional structures may be taken as evidence of a natural evolutionary history against a designed origin for the non-functionality of the structure. Thus, the efficient cause of non-functional structures may be taken as evolution, because intelligently acting beings tend not to create non-functional objects.

This returns us to the question about junk-DNA and pseudogenes. Are they non-functional pieces of genetic garbage which would never have been designed, or are they simply another cog in the intelligently designed biochemistry of life, performing a function the designer intended? Well, as seen previously, the latest evidence seems to hint that they may have a biologically functional role. Some scientists are beginning to suspect that junk-DNA may play a large role in the cell, and as seen on page 4, more and more functionality for "junk-DNA" is being suspected all the time. Thus, here are some options for pseudogenes:

1. They arose through natural, evolutionary processes and are not functional.
2. They were once designed functional but now are not.
3. They were designed as non-functional in the biological sense, but were intended to become functional in the future. Creationist biologist Todd Wood notes that some pseudogenes could be, "latent genes that were never activated or previously active genes that were inactivated."
4. They were designed functional and are still functional today.

Items 1-3 assume that pseudogenes perform no biological function. Items 2 and 3 may seem to throw out the scientific prediction of intelligent design that designers always produce functional designs. However, it should be noted that in these cases the designer did produce the pseudogenes to perform some function. The prediction of intelligent design that designers produce functionality remains unscathed, for it could be possible to test the hypotheses that perhaps pseudogenes were once functional, or that they are latent genes. However, current research and trends in biology indicate that they may indeed have a function. Thus, intelligent design theory implores us to prudently adopt a "wait and see" approach to pseudogenes, as we may have good reason to believe they are functional.

The debate over pseudogenes shows how some objections to intelligent design theory are not actually objections to the scientific theory of intelligent design. Such non-scientific theological objections are by no means unfamiliar to theologians, who have been pondering what a Creator would or would not produce for thousands of years. Typically, these do not hold up when theological answers are given. Once we can determine whether an objection to intelligent design hits at a scientific or theological objection, we can begin to test between intelligent design and evolution and make progress in this debate. 

# Radioheads Discuss Intelligent Design

## IDEA Staff discusses Hillsdale College Intelligent Design Debate on the air with talk radio host Michael Law.

On November 11-13, 2002, IDEA Center staffers Ryan Huxley, Casey Luskin, and Scott Uminsky went on the radio with San Diego area talk show host, Michael Law, discussing the Intelligent Design Debate at Hillsdale College. Law is the host of "The Grapevine" in KPRZ 1210 AM in the afternoons in the San Diego area.

The debate included well-known scholars from both the Darwinist and intelligent design camps. Darwinists included philosopher Michael Ruse, physicist Mano Singham, philosopher Larry Arnhart, and paleontologist Niles Eldredge, while intelligent design proponents included biochemist Michael Behe, biologist Jonathan Wells, and mathematician and philosopher William Dembski. Mr. Law invited IDEA staff members to provide radio commentary on the 7 presentations made during the debate.

Perhaps surprisingly, Darwinist Larry Arnhart advocated that that intelligent design should be taught in schools so students will have a better understanding of these important scientific issues. Unfortunately Arnhart seemed to have simultaneously implied that intelligent design proponents do not advocate academic freedom because they advocate that schools should *stop* teaching evolution. The truth is that nearly all in the intelligent design movement advocate teaching *both* evolution *and* intelligent design so that students can learn to critically evaluate the evidence free from censorship of the evidence. This is the exact same pro-academic freedom, pro-education position advocated by Arnhart, yet Arnhart seemed to act as if he was the lone champion for the cause for academic freedom.

Regardless of who first championed a democratic ideal, it is encouraging that this Darwinist agrees that academic freedom makes for good education. Thankfully, even when they take the credit for it, when Darwinists advocate our own position, our battle is essentially won.

Michael Ruse then argued against irreducible complexity using the "stone arch" analogy, where an irreducibly complex structure can be built using scaffolding (but where did the irreducibly complex scaffolding come from?). Ruse also made theological criticisms that a designer wouldn't make people have diseases like sickle-cell anemia (see page 1 for a discussion of this theological objection to design). Later, physicist Mano Singham complained that intelligent design

does not obey general laws nor lead to deductive conclusions. Essentially, Singham argued that intelligent design is not predictive. Yet Singham's charges are far off base because intelligent design does make predictions. For details, see the IDEA Center website at <http://www.ideacenter.org/falsify.htm>.

Niles Eldredge, a paleontologist, agreed that predictions are key to making a theory scientific, and he admitted that it is indeed possible to make predictions about human design. Eldredge objected to intelligent design theory stating that one cannot make predictions about supernatural design. A similar objection had also been made by Arnhart, who claimed that intelligent design cannot infer "divine design." Yet intelligent design theory does not infer "divine design" but rather mere "intelligent design." By observing human designers, we know that intelligent agents tend to produce high levels of information when acting. This should hold true whether the designer is "natural" or "supernatural." Intelligent design theory bases its mechanism of how designers operate by observing human designers, and it assumes that all designers are intelligent. If a human designer has a property of "intelligence," this same property could be found in other non-human, or even non-natural agents. Whether natural or supernatural, intelligent agents tend to produce objects with high – information content. This rebuts the objections of Eldredge, and Arnhart and demonstrates a universal prediction of intelligent design theory.

Supporting intelligent design, Michael Behe gave his usual presentation describing the irreducibly complex bacterial flagellum, and showed deficiencies in arguments put forth by Darwinists for the origin of the flagellum and the blood clotting system. Jonathan Wells outlined problems with various lines of evidence used to prove evolution, such as Haeckel's embryos and through fossil evidence. Finally, William Dembski discussed intelligent design's positive research program, showing how we can safely infer intelligent design through an "explanatory filter."

IDEA staff members Huxley, Luskin, and Uminsky enjoyed discussing these presentations for three evenings on the radio with Michael Law. Because radio host Michael Law was broadcasting from Michigan, they had the opportunity to sit alone in the radio studio in San Diego while interacting with Mr. Law. It was a good experience for all, and IDEA Center staff members are grateful to Michael Law and KPRZ 1210 AM for the opportunity to go on the air.



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## Spotlight: The Baraboo IDEA Club

In 2002, Ralph and Pamela Krainik founded the first "off-campus" IDEA Club Chapter in the community of Baraboo, Wisconsin. Since its inception, Ralph and Pam have worked hard and their club has been a great success. They have held monthly meetings at which they show and discuss videos on topics related to creation and evolution. Membership has grown significantly, and has attracted professionals including doctors and scientists. A number of people have been positively impacted through their club. Their success may be attributable to their publicity strategy post ads in the local newspaper as well as the unashamed spirit in which they talk about intelligent design. This past month, they participated in the county fair where they displayed a booth on creation and evolution. Ralph and Pam have proven that IDEA Clubs can succeed off campus, with a little hard work, publicity, and perseverance. More information can be found on their website at <http://www.geocities.com/barabooidea/>.



# Some Great IDEAS!



## Third IDEA Course to be taught in conjunction with Faith Seminary

Beginning September 15, 2003, the IDEA Center will host its third IDEA course: the "IDEA Course *Reloaded!*" It is so named because it is the second time the Center has been given the opportunity to teach the course this year. Attendees will see additions and improvements over IDEA courses of the past. The course will teach basics of the intelligent design – evolution issue, taught by IDEA staff, as well as three special guest lecturers. Topics include:

| <u>Topic</u>  | <u>Instructor</u>  |
|---|--|
| • Introduction to Intelligent Design Theory               | Steve Renner   |
| • Scientific Problems with Evolution (the "Icons")        | Casey Luskin   |
| • Exegesis of Genesis 1 and 2                             | Guest lecture Matt Tague (Pastor, Carlsbad Community Church) |
| • Three Views on Creation and Evolution                   | Guest lecture: Gordon Carle (Faculty, Faith Seminary)        |
| • Evidence for Design of the Cosmos                       | Ryan Huxley  |
| • Scientific Problems with the Chemical Origins of Life   | Casey Luskin   |
| • The Fossil Record                                       | Casey Luskin   |
| • Darwin and the Law                                      | Guest lecture: Myron Steeves (President, Newport Institute)  |
| • Advanced Intelligent Design Topics: Evolving Complexity | Scott Uminsky / Casey Luskin                                 |
| • What it means to be Human                               | Scott Uminsky  |
| • Philosophical implications of Design and Evolution      | Eddie Colanter   |

The course begins Monday September 15<sup>th</sup>, 2003 and will meet Monday evenings for 10 weeks. It will be taught in conjunction with Carlsbad Community Church ([www.3c.org](http://www.3c.org)) and Faith Seminary, and classes will take place on the church campus. For more information, or to register, please visit <http://www.ideacenter.org/idclass.htm> or see the form below.

## THINK AGAIN CONFERENCE

### Intelligent Design In the Universe – July 26<sup>th</sup>, Carlsbad Community Church

On July 26<sup>th</sup>, 2003, the IDEA Center is co-sponsoring the "Think Again Conference" at Carlsbad Community Church ([www.3c.org](http://www.3c.org)) just north of San Diego, California. Featured speakers include biochemist Michael Behe, philosopher J.P. Moreland, and theologian and legal expert H. Wayne House. The speakers will discuss the evidence for intelligent design in the universe, and the theological, legal, and social implications. Concurrent speakers include IDEA Center staff.

General admission is \$25, with a student rate of \$15. Conference registration will be available at the church on the day of the conference, beginning at 8:15 am. The conference will last from 9 am - 4 pm. **The conference will be immediately followed with a special reception with snacks and hors d'oeuvres where attendees can interact with the speakers, sponsored by the IDEA Center.** Please join us for this exciting day of learning about intelligent design in the universe!

For more information, please visit the Think Again Conference website <http://www.ideacenter.org/thinkagain/>.



Michael Behe



H. Wayne House



J.P. Moreland

Conference Speakers Include:

## Membership and Course Registration Form

This is a form to become an IDEA Center Member, to register for the IDEA Course (begins Sept 15, 2003) and / or to register for the "Think Again" Conference (July 26<sup>th</sup>, 2003). As an IDEA Center Member, you'll receive this free electronic biannual newsletter with updates about IDEA Center activities, creation-evolution resources, and science news. The IDEA Center currently exists as a non-profit organization and we humbly accept your donations. Please check any appropriate boxes below.

### Please make me an IDEA Center Member:

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- IDEA Member (free):** Receive free electronic biannual newsletter, and e-mail updates.
- Complex Member (\$25 donation):** Receive free biannual newsletter, e-mail updates, and free admission to IDEA conferences for 1 year.
- Specified Complex Member (\$100 donation):** Receive IDEA annual budget, free biannual newsletter, email updates, free admission to IDEA conferences for 1 year, and one book of your choice from the IDEA Center Catalog.
- Irreducibly Complex Member (\$500+ donation):** Receive IDEA annual budget, biannual newsletter, e-mail updates, free admission to IDEA conferences for life and any four books of your choice from the IDEA Center Catalog.
- Order a T-shirt (\$15 donation):** You'll receive a large IDEA Center t-shirt with the logo shown on page 3.

Please make any donation checks out to the "IDEA Center."

### Please register me for the Think Again Conference:

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To register for the *Think Again Conference*, please check the following box:

Yes, I would like to register for the Think Again Conference.

The Think Again Conference will take place on Saturday, July 26<sup>th</sup>, at Carlsbad Community Church. General registration fee is \$25, however students may register for \$15. Registration may be made through this form, and payment is currently being accepted for the conference.

### Please register me for the IDEA Course Reloaded:

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To register for the *IDEA Course Reloaded*, please check the following box:

Yes, I would like to register for the IDEA Course *Reloaded!*

The Course will meet for ten weeks on Mondays from 7 - 9pm, beginning September 15<sup>th</sup> through November 18<sup>th</sup> (totaling 20 class hours). The course is being taught in conjunction with Faith Seminary and can be taken for graduate credit at Faith Seminary ([www.faithseminary.edu](http://www.faithseminary.edu)). After registering for the course, course instructors will contact all registrants with payment information, and will provide more detailed class schedule and syllabus. The class is open to everyone by purchasing a "Listener's Pass" for \$25. Thanks for your interest.

Name: \_\_\_\_\_

Occupation / Academic Affiliation: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

Phone: \_\_\_\_\_ E-mail: \_\_\_\_\_

Please be sure check all appropriate boxes and mail this form to:

IDEA Center  
P.O. Box 17424  
San Diego, CA 92177