Life on Another Planet-Just Around the Corner?

In late April [2007], a group of European scientists made an announcement that created quite a stir in the mainstream media. For the first time, a planet which could potentially support life has been discovered outside of our solar system. One newspaper headline read "Scientists find potentially habitable planet—Discovery a big step in search for life in universe"{1}. Such an announcement raises important questions:

> *Is this newly discovered planet really a likely host for life?*
>
> *Does this discovery imply that the earth is not unique is its ability to support complex life as promoted by most proponents of Intelligent Design?*
>
> *If this planet does (or did) host life, would that detract from or support our belief in a transcendent creator?*

By considering these questions, we realize that this discovery provides more support for the theory of Intelligent Design than for Darwinism.

A Potentially Habitable Planet?

This planet orbits the red dwarf star, Gliese 581 and has been designated as 581 c. It cannot be seen from earth. It was detected by examining the effect its gravity had on the light emanating from its star. Based on that data, these scientists projected that this planet may have temperatures between 32 and 104 degrees. With this temperature range and at 1.5 to 2 times the diameter of earth, it might be able to hold liquid water. In addition, its red dwarf star appears to be quite old and stable, suggesting that its planets may have been around

for billions of years. Thus, some of the characteristics necessary for a naturalistic explanation of life may be associated with this planet.

However, a habitable planet requires much more than "just add water"{2} plus time. Further analysis of Gliese 581 c indicates that it probably has many characteristics unfavorable to life. Examples include:

> *It does not rotate around its axis, meaning one side is always in the sun while the other side remains in constant darkness. Some scientists are now suggesting that its surface temperatures will be much hotter than the original estimates.*
>
> *Since it orbits a red star with lower levels of electromagnetic radiation than our sun, this greatly limits the effectiveness of photosynthetic reactions.*

Uniqueness of Earth

On the Reasons To Believe Web site{3}, astrophysicist Hugh Ross has posted several articles identifying characteristics of our galaxy and earth that are necessary for life. In one paper{4}, he estimates the probability of the universe having a planet like earth exhibiting all 322 characteristics identified as critical for life. A high level analysis of the list in his paper indicates that Gliese 581 c may satisfy 112 of these characteristics (primarily because it exists in the same universe and galaxy as earth). Gliese 581 c is the first out of 220 planets identified outside our solar system that exists in the habitable temperature zone.{5} That leaves at least 210 questions unanswered such as:

> *Does it have a large enough moon to create tidal patterns?*
>
> *Does it have just the right size, protecting planets to reduce the number of asteroid hits?*

Does it have the right thickness of crust?

Does it have the right atmosphere?

Does it have the right mixture of minerals?

Using the probability estimates for each remaining characteristic, a conservative estimate for the probability that this planet could support life is 1 in 10^{199} (1 with 199 zeros after it). Please remember that this extremely low probability (essentially zero) is simply to have a planet that is habitable. It does not include the similarly minuscule probability of even the simplest life forms arising from inorganic matter. As renowned astrophysicist Stephen Hawking stated, "I expect there will be planets like Earth, but whether they have life is another question. We haven't been visited by little green men yet."{6} Since we can be virtually certain that this planet does not support any life, we may not want to spend the effort to travel to it—especially, when with current technology, it would take over 400,000 years to reach this planet.

Life on another planet—What would it mean?

Would finding life on another planet be a victory for Darwinism and proponents of naturalistic evolution as the sole force behind life as we know it? Quite the contrary! Given the extremely small probability of finding another habitable planet in our universe, multiplied by the equally small probability of life generating spontaneously on a habitable planet, finding life on another planet would have to be considered a miracle.

In other words, finding even the simplest life forms on another planet would greatly increase the scientific evidence for intelligent design. Only a transcendent intelligent

designer would be able to overcome those long odds to create life in multiple places in the universe. The theological implications of such a discovery would depend upon the nature of the life forms and will be left for future ponderings.

Bottom Line

The discovery of Gliese 581 c is an interesting event in astronomy which, if anything, further supports our view that the earth is very likely unique in its ability to support complex life. If life is ever discovered on another planet, it will further strengthen the position of intelligent design as the best theory to explain the evidence.

Notes

1. *Dallas Morning News*, April 24, 2007.

2. Jay Richards, Acton Institute, formerly with The Discovery Institute, the institutional home of the Intelligent Design movement.

3. www.reasons.org

4. Hugh Ross, "Probability for Life on Earth, 2004 April Update", Reasons to Believe, 2004.

5. It is interesting to note that Ross's paper allocated a probability of 1 in 1,000 to that same factor, which is the same order of magnitude as 1 out of 220. So if we used 1 out of 220 instead, the calculated probability would be less than 1 in 10^{198}.

6. *Dallas Morning News*, April 24, 2007.

Stem Cells for Everyone: A Breakthrough?

As far as dramas go, the stem cell saga contains all the elements of a juicy prime-time soap opera. The excitement, the promises, the characters, the politics, the lies, the scandal, the moneythe only thing missing is sex, but thats the point, isnt it?

On November 20, 2007, the journals *Science* and *Cell* announced a truly major discovery. It was a way to convert human skin cells taken from a simple skin biopsy into *stem cells* that behave like an *embryonic stem cell*but the byproduct is not an embryo and can in no way become one.{1} This has the effect, say many, of sidestepping the ethically troublesome practice of creating then destroying human embryos in order to treat diseases.

This new method is efficient. One biopsy can produce 20 stem cell lines, and can be taken from the patient himself, eliminating the risks associated with tissue rejection. We hear about stem cell breakthroughs all the time; how is this one different? Is this method ethical? Will it save as many lives as embryonic stem cells promise to? Is this the end of the stem cell controversy?

The Saga

Stem cells are simply cells that make other cells. Their job is to be a cell factory. By analogy, think of a rose. From the stem of the rose grows leaves, the flower, and thorns. The thorns dont produce flowers, the leaves dont produce thorns, and the flower doesnt produce leaves, but the stem does. The stem is versatile; it can make many parts of the plant. Stem cells operate the same way. Some stem cells are more versatile than others. In other words, some stem cells can make many

types of cells and others can only make one type of cell.

The history of embryonic stem cells dates back to the 1950s when two scientists isolated a teratoma from a mouse. A teratoma is a tumor that is composed of various types of cells from hair cells to eye cells to teeth to nails, so the scientists aptly named it a *teratoma*, or monster. When investigating this tumor, the scientists found that the stem cells that produced this array of cell types had very similar properties of embryonic cells. Thus began the investigation into embryonic stem cells.{2}

Before the term stem cells had become popular, bone marrow transplants had been used to treat patients with leukemia. Whenever a patient receives a bone marrow transplant from a donor, they are really receiving a type of stem cell therapy. At this point, scientists could only use bone marrow stem cells for very specific cell replacement. These stem cells were not very versatileat least that was the theory at the time. Since then, bone marrow stem cells have been found to be quite versatile, and can be coaxed into becoming a variety of cells. Scientists have now found a variety of adult stem cells throughout the body and have been using them in humans to cure or alleviate a number of diseases or conditions (see www.stemcellresearch.org for a complete list).

Another breakthrough with stem cells arose from tissues such as umbilical cord blood, placental tissue, amniotic fluid and even menstrual bloodall obtained without harming the life of the baby at any stage of development. Each of these stem cells are a little more versatile than the adult stem cells, meaning that they can become two or three different types of cells, and in many cases the donor/recipient need not be an exact match. The National Cord Blood Program is just one group that allows parents to put their babys umbilical cord blood in a bank so that he or she could use it for therapy sometime in the future, or they can donate the umbilical cord for others to use. See www.nationalcordbloodprogram.org for a list of

patient success stories.{3}

If these are *adult* stem cells, then what are *embryonic* stem cells? These are cells removed from the eight-day-old embryo. When these cells are removed, the embryo dies. These cells produce almost all of the cells in the human body, and therefore are the most versatile stem cells. You may have heard of these cells as being pluripotent. That simply means that they are very versatile. Some scientists believed that embryonic stem cells (ESC) research was where time, money and resources should go since we know that these cells have the potential to become any cell type.

Numerous success stories of treatments with adult stem cells have been under-reported by the media, while the supposedly cure-all ESC were hypedeven though they have shown no actual success in humans. Ironically, adult stem cells have been saving patients lives for years (bone marrow transplants), while ESC scientists have yet to control the growth rate of the ESC. In what shouldnt be a surprise to anyone, ESC tended to form grotesque tumors (teratomas) composed of various cells found in the body.

Debate over the ethics of using embryos became heated within the political arena. The individuality and dignity of the embryo came into question. Scientists wanted unfettered research{4} so that all options can be explored to cure diseases, while others considered the embryo a very vulnerable life that has the right to be protected from experimentation. Both sides claimed to be arguing for the good of humanity.

These debates, however, have taken a slightly different turn with the recent discovery of converting skin cells into pluripotent stem cells mentioned above.

Skin Cells

As mentioned, now scientists have isolated human stem cells that are as versatile as embryonic stem cells, but no embryos were used to obtain these stem cells. While more studies are needed to confirm that these cells act like ESCs in the human body, they behave just like ESCs in the lab.

There are a few concerns with this procedure. One of the biggest concerns is the way these stem cells are made. Both research groups had to use a type of virus to insert the right code into the skin cells to tell it to become a stem cell. This virus may be harmful to humans. However, both scientists are researching safer methods for coaxing the skin cells into stem cells.{5}

So is this method ethical? I strongly believe the answer is yes. As Leon Kass, former head of the Presidents Council on Bioethics, stated in a *National Review Online* symposium, Reprogramming of human somatic cells to pluripotency is an enormously significant achievement, one that boosters of medical progress and defenders of human dignity can celebrate without qualification.{6} Sanctity of life advocates can celebrate because no embryos are created or destroyed for research.

Both scientists who first published on this new discovery, Dr. James A. Thomson from the U.S. and Dr. Shinya Yamanaka from Japan, said that this research could not have been done without the knowledge that we already had from embryonic stem cells. And Thomson, who was one of the first scientists to remove a stem cell from a human embryo,{7} has specifically stated that embryonic stem cell research should continue.{8} We must keep this point in mind, but we must also remember that, contrary to what some in the scientific community are saying, both scientists had more than just economic reservations about using embryos in their research:

> *Thomson: If human embryonic stem cell research does not make you at least a little bit uncomfortable, you have not thought about it enoughI thought long and hard about whether I would do it.{9}*

> *Yamanaka: When I saw the embryos, I suddenly realized there was such a small difference between it and my daughtersI thought, we cant keep destroying embryos for our research. There must be another way.{10}*

Is This Match Point?

Most people agree that this changes the political and scientific culture of the stem cell debate. Surprisingly, some major players have come around.

Jose Cibelli, research scientist whose successful primate cloning was overshadowed by the skin cell announcement states, If their method is as good as the oocyte (the cell that forms a human egg)we will be no longer in need of the oocytes, and the whole field is going to completely change. People working on ethics will have to find something new to worry about.{11} Even Ian Wilmut, the scientist famous for creating Dolly the Sheep [see Probe article], decided to abandon cloning and work with reprogramming cells instead. As the Britains *Telegraph* reports, The scientist who created Dolly the sheep, a breakthrough that provoked headlines around the world a decade ago, is to abandon the cloning technique he pioneered to create her. I decided a few weeks ago not to pursue nuclear transfer, Prof Wilmut said.{12}

Several of the participants of *National Review Online* Symposium agree that this removes the ethical concerns from researching pluripotent cells, and, pragmatically, this seems to be significantly more efficient than cloning embryos to remove stem cells. Case closed? Not quite.

Not all agree that this is the end of using embryos to extract stem cells. As Wesley Smith, bioethicist, vocal ESC critic and Discovery Institute fellow, points out on his blog, www.bioethics.com:

> *If anyone thought that the pro-human cloners would fold up their tents and steal away after the news was released that patient-specific, pluripotent stem cells had been derived from normal skin cells, they just dont understand how fervently some scientists and their camp followers want to clone human lifeand how hopeful some are that the stem cell issue can be the vehicle that wins the culture war.{13}*

Recall that we are dealing with scientists careers and, for the most part, scientists with a utilitarian worldview. A scientist whose worldview is dictated by whatever is for the greater good and has built his entire career and reputation around embryonic stem cell research is not going to readily abandon it. To see the interplay of both career and worldview choices, Dr. Hans Keirstead, neurobiologist and stem cell researcher at the University of California-Irvine, had this to say in an interview for the *Arizona Daily Star*:

> *I do think a great deal of this work could be done with the skin-cell derived stem cells. But wed have to start completely over, from scratch, and we are not going to slow down to do that, not at this point.*

It is my personal feeling its a very ethical decision to use this tissue [Embryonic Stem Cells] to end human suffering, to better human life, than to destroy it.{14}

Conclusion:

As Christians, we operate within an ethical framework dictated by Gods word. Although the Bible does not mention stem cells, it *does* make clear that we are made in Gods image (Genesis

1:26, 27), that God knew us and knit us together within our mothers womb (Psalm 139: 13-16), and how God called prophets before they were even born (Isaiah 49:1; Jeremiah 1:4-5). God values the life of the unborn. We do not always have the privilege of seeing ethical decisions vindicated in our lifetime, but we can be confident that God is sovereign over all things.

Notes:

1. Takahashi, Kazutoshi, et al, Cell 131, 861-872, November 30, 2007; Yu, Junying, et al Sciencexpress, www.sciencexpress.org, (fee/registration to access full article) November 20, 2007.
2. From teratocarcinomas to embryonic stem cells and beyond: a history of embryonic stem cell research Solter, *Davor Nature Reviews* 326, vol. 7, April 2006.
3. See list of references from Family Research Council, www.frc.org/get.cfm?i=IS06H01. See also www.stemcellresearch.org/facts/asc-refs.pdf for a sampling of peer reviewed research articles.
4. This case history [of ESC research] again reinforces the old truism that unfettered basic research driven only by scientific curiosity is usually the best way to discover things of enormous practical value Solter, *Davor Nature Reviews* 326, vol. 7, April 2006.
5. Two Major Studies Show: Human Pluripotent Stem Cells without Cloning or Destroying Embryo analysis by Maureen Condic, Ph.D. from www.stemcellresearch.org/statement/pptalkingpointsweb.pdf.
6. National Review Online NRO Symposium, nationalreview.com, Brave New Future.
7. Thompson, James A. et al, *Science* 282, 1998.
8. Standing in the Way of Stem Cell Research by Alan I. Leshner and James A. Thomson *Washington Post*, 12-0-07, pg. A17.
9. Man Who Helped Start the Stem Cell War May End It by Gina

Kolata, *New York Times,* Nov. 22, 2007.
10. Risk Taking Is in His Genes by Martin Fackler, *New York Times*, 12-11-07.
11. Vogel, Gretchen, and Holden, Constance , Field Leaps Forward with New Stem Cell Advances *Science* 318, 23 November 2007, p. 1224.
12. Dolly creator Prof Ian Wilmut shuns cloning by Roger Highfield, *Telegraph* 11/16/07, www.telegraph.co.uk.
13. 'Lead Into Gold:' Stem Cell Counter-Attack by Wesley Smith. Posting for November 27, 2007 www.bioethics.com.
14. Human embryonic stem-cell work must go on, says researcher by Carla McClain, *Arizona Daily Star*, 11-28-2007.

Redeeming Darwin: The Intelligent Design Controversy

Dr. Bohlin, as a Christian scientist, looks at the unwarranted opposition to intelligent design and sees a group of neo-Darwinists struggling to maintain the orthodoxy of their position as the evidence stacks up against them. In this article, he summarizes what's happening in academia and the lack of sound scientific basis for their attacks agains intelligent design proponents.

What's All the Fuss?

There's a strange phenomenon popping up around the country. Scientists are stepping out of their laboratories and speaking to the media about something that has them quite concerned. It's not the threat of a new flu pandemic; it's not the threat of nuclear weapons proliferation, or even the possible threat of global warming. It's something called Intelligent Design.

In this article we will explore what has so many people upset about Intelligent Design. To do that we will need to establish just what ID is and what the major complaints are about evolution that may be answered by a theory like ID. We will take a closer look at some of the most common examples of ID from astronomy and biology. Then we will take a closer look at the cultural confusion and reaction to this rather simple hypothesis.

So what are scientists and journalists saying? A *Baltimore Sun* reporter put it this way: "In the border war between science and faith, the doctrine of 'intelligent design' is a sly subterfuge—a marzipan confection of an idea presented in the shape of something more substantial."{1}

In other words, Intelligent Design is little more than a sugar cookie promising more than it can deliver.

A science journal editorial said this: "The attack on Darwinism by supporters of Intelligent Design is a straightforward attack on science itself. Intelligent Design is not science because it proposes a supernatural designer as explanation for evolutionary change."{2}

Uh-oh! Science and the supernatural indeed rarely go well together, at least over the last 150 years. But is that what ID actually says? We'll explore that a little later but for now let's find out what's really at stake in this debate over evolution and Intelligent Design.

One college textbook said this: “Evolution is a scientific fact. That is, the descent of all species, with modification, from common ancestors is a hypothesis that in the last 150 years or so has been supported by so much evidence, and has so successfully resisted all challenges, that it has become a fact.”{3}

Let’s look at a few reasons why some scientists are skeptical of the confidence shown by so many other scientists about Darwinian evolution.{4}

Is There Scientific Proof for Evolution?

Evolution is always portrayed as a slow gradual process. Organisms are portrayed as so well adapted to their environment that they could only afford to change very slowly. But one of the most dramatic events in earth history is something called the Cambrian explosion. The Cambrian is a period of earth history that many earth scientists and paleontologists estimate to have begun over 540 million years ago.{5}

Instead of slow steady evolutionary change, we see a sudden burst of change. The subtitle to a *Time* magazine article put it this way: “New discoveries show that life as we know it began in an amazing biological frenzy that changed the planet almost overnight.”{6}

For most of the previous 3 billion years of earth history only single-celled organisms were found. “For billions of years, simple creatures like plankton, bacteria and algae ruled the earth. Then, suddenly, life got very complicated.”{7}

So the appearance of most of the major categories of animals happened in a very short period of time, some say less than five million years, when it should have taken tens and maybe even hundreds of millions of years. One geologist who helped pinpoint the very short time frame of the Cambrian explosion

expressed this challenge: “We now know how fast fast is. And what I like to ask my biologist friends is, how fast can evolution get before they start feeling uncomfortable?”{8}

The evolutionary process that biologists study in nature today is far slower than what is found in the Cambrian explosion. This is evidence that doesn’t fit the theory. Yet the Cambrian explosion is left out of most textbooks.

Another problem for evolution is its dependence on mutations to bring about major changes in organisms. But for all our studies of mutations we haven’t seen much change. The late French evolutionist, Pierre Paul Grasse, said, “What is the use of their unceasing mutations? . . . a swing to the right, a swing to the left, but no final evolutionary effect.”{9}

Mutations only produce alternate forms of what already exists. New functions don’t suddenly arise by mutations.

Evidence for Intelligent Design, Part One

Intelligent Design is an intellectual movement that challenges Darwinism and its dependence on random/chaotic processes coupled with selection. If people are not alerted to the fact that Darwinism is less than sufficient, then other theories are wasting their time. They will never get a fair hearing.

Intelligent Design is also a scientific research program that investigates the effects of intelligent causes, which are effects of high specificity coupled with extremely small probabilities.

Now that was a mouthful. What do I mean by high specificity coupled with small probability? Think of the lottery. Someone always wins the lottery despite the long odds. So improbable things do indeed happen.

But let’s make this specific. Let’s say your sister wins the lottery. Now that is someone you specifically know; but again

someone always wins the lottery so the fact that it's your sister doesn't warrant any special attention.

Now let's make things a bit *less* probable and much *more* specific. Let's say your sister wins the lottery not once but three weeks in a row. Now what are you thinking? Like most people you're thinking something is not right. The same person doesn't win the lottery three weeks in a row.

You suspect cheating. You suspect Intelligent Design. Someone with a clever mind is somehow manipulating the lottery.

In astronomy, it has been assumed for several decades that our earth is not likely to be very special. As huge as the universe is, with billions of galaxies, each with billions of stars, surely there are thousands if not millions of planets like ours that are suitable for life.

But lately, more and more planetary astronomers, astrophysicists, cosmologists, and philosophers are realizing that earth is actually quite unique. The recipe for earth is more than just a planet plus mild temperatures plus water.

Our earth is 93,000,000 miles from the sun. Five percent closer and we would be a hothouse like Venus with no chance for life. If we were twenty percent farther away, we would be a frozen wasteland like Mars. We're just right. Liquid water is necessary for life and our earth has an abundance all year long.

Evidence for Intelligent Design, Part Two

It's really quite amazing to realize that biologists universally recognize the design of living things. Oxford biologist and atheist Richard Dawkins said on page one of his book *The Blind Watchmaker*: "Biology is the study of complicated things that give the appearance of having been designed for a purpose."{10}

Now notice he said, “give the appearance of having been designed for a purpose.” Living things certainly look designed, but according to Dawkins, it’s an illusion. He spends the rest of his book trying to show how mutation and natural selection, the “blind watchmaker,” has created this illusion.

But he does admit things look designed. Well, if it looks designed, maybe it is.

Michael Behe introduced the concept of irreducible complexity in his book *Darwin’s Black Box*. Something is irreducibly complex if it is composed of two or more *necessary* parts. Remove one part and function is not just impaired but destroyed. His well-known example is a mousetrap.

A mousetrap is composed of five integral parts: the platform to which everything is attached, the hammer which does the dirty work, the spring which provides the force, the holding bar to keep the hammer in tension, and finally the catch to keep the holding bar in tenuous position. Remove any one of these parts and the mousetrap is not just less efficient; it ceases to function at all. All five parts are necessary. You can’t build a mousetrap by natural selection by adding one piece at a time because it has no function to select until all five parts are together.

Behe showed that the cell, Darwin’s “Black Box,” is filled with irreducibly complex molecular machines that could not be built by natural selection. In Darwin’s time, scientists could only see the cell under very low power microscopes that told little about what was going on inside. It was a black box. Over the last fifty to sixty years, the cell has been revealing its secrets. We have discovered a maze of complexity and information.

If it looks designed, maybe it is!

ID, Science, Education, and Creation

The legitimacy of Intelligent Design as science was at the heart of a recent federal court case, pitting a group of parents and students against the school board from Dover, Pennsylvania. The Dover School Board adopted a policy that mandated a statement be read before all biology classes, indicating that evolution was a theory that needed critical evaluation and that intelligent design was a rival theory that students could seek information about from the library.

Judge Jones not only struck down the policy as unconstitutional, he went further to declare that ID is not science and was motivated purely by religion since it was just a repackaged creationism. His written opinion was scathing. This of course delighted proponents of evolution and many have declared that ID now is dead.

Judge Jones claimed that ID simply is not science and is religiously motivated; therefore it should not even be mentioned in a high school science classroom.

The first question that should occur to you is, Why does a federal judge with no training in science use his courtroom as a means of determining what is and is not science? This problem has been referred to as the demarcation problem. How do we demarcate science from non-science? People putting down ID often refer to it as "pseudo-science" or simply "unscientific." But philosopher of science Larry Laudan writes, "If we would stand up and be counted on the side of reason, we ought to drop terms like 'pseudo-science' and 'unscientific' from our vocabulary; they are just hollow phrases which do only emotive work for us."{11}

Judge Jones claims that ID has been refuted by mainstream scientists. He cites the work of Kenneth Miller in particular. This is rather strange indeed. For ID to be refuted means that it has been tested by science and found wanting. If it is

testable scientifically to the degree that it can be refuted, then it is science after all. This logical contradiction does not seem to occur to Judge Jones.

ID uses empirical data to demonstrate the plausibility of a design inference. It's as scientific as Darwinism.

Notes

1. Baltimore *Sun*, August 13, 2006.
2. *Cell*, January 13, 2006.
3. Douglas Futuyma, *Evolution* (Sinauer Assoc., Sunderland, Mass., 2005), xv.
4. To learn more about Intelligent Design and Evolution visit our website, probe.org, or call us at 1-800-899-PROB, for information about our new DVD based small group curriculum, "Redeeming Darwin: The Intelligent Design Controversy." Once again we have teemed up with EvanTell to produce a small group curriculum designed to inform the church about Intelligent Design and how to use a conversation about this controversial topic to share the gospel.
5. Meyer, Stephen C., Marcus Ross, Paul Nelson and Paul Chien, 2003, *The Cambrian explosion: Biology's Big Bang in Darwinism, Design, and Public Education*, John Angus Campbell and Stephen C. Meyer, eds., East Lansing, Michigan: Michigan State University Press, pp. 323-402.
6. *Time*, December 4, 1995 (cover).
7. Ibid., 67.
8. Samuel Bowring, *Time*, 1995, 70.
9. Pierre-Paul Grassé quoted in *The Natural Limits to Biological Change*, Lane P. Lester and Raymond G. Bohlin, Richardson, Texas: Probe Books 1984., p. 88.
10. Dawkins, Richard, *The Blind Watchmaker: Why the Evidence of Evolution Reveals a Universe without Design*, Nerw York, New York: Norton, 1986.
11. Larry Laudan, (1983) "The demise of the demarcation problem," in Michael Ruse (ed.) *But Is It Science?*, Amherst, Prometheus, 337-350.

Darwinism and Truth

Darwinism and the Fact/Value Split

Nancy Pearcey writes in her book *Total Truth* that Christians must counter the effects of our secular culture and mindset by developing a consistent and comprehensive biblical worldview.{1} In the middle chapters of her book, she demonstrates how Christians should do this with the question of origins.

Earlier in her book she notes that our society has divided truth into two categories. She calls this the sacred /secular split or the private/public split or the fact/value split. They are different ways of saying the same thing. Religion and moral values are subjective and shoved into the upper story where private opinions and values reside. And in the lower story are hard, verifiable facts and scientific knowledge.

There is another key point to this split. The two spheres should not intersect. In other words, it would be bad manners and a violation of logic to allow your personal and private choices and values to intersect with your public life. As the popular saying goes, that would be "shoving your religion down someone's throat."

Ray Bohlin's review of Pearcey's book provides further explanation for how this idea plays out in society.{2}

Darwinists accept this split and have even tried to convince Christians that in this way religion is safe from the claims and conclusions of Darwinian evolution. But a brief glance at

the best seller list shows that evolutionists regularly invade this upper story of values with their harsh criticism.

In *The God Delusion*, Richard Dawkins says that religious belief is psychotic, and arguments for the existence of God are nonsense. Sam Harris echoes that sentiment in his bestselling book, *Letter to a Christian Nation*. Daniel Dennett, in his book *Breaking the Spell*, believes that religion must be subjected to scientific evaluation.

Nancy Pearcey shows that Darwinism leads to naturalism. And this is a naturalistic view of knowledge where "theological dogmas and philosophical absolutes were at worst totally fraudulent and at best merely symbolic of deep human aspirations."{3} In other words, if Darwinian evolution is true, then religion and philosophical absolutes are not true. Truth, honesty, integrity, morality are not true but actually fraudulent concepts and ideas. If we hold to them at all, they were merely symbolic but not really true in any sense.

Daniel Dennett, in his book *Darwin's Dangerous Idea,* says that Darwinism is a "universal acid" which is his allusion to a children's riddle about an acid that is so corrosive that it eats through everything including the flask that holds it. In other words, Darwinism is too corrosive to be contained. It eats through every academic field of study and destroys ethics, morality, truth, and absolutes. When it is finished, Darwinism "eats through just about every traditional concept and leaves in its wake a revolutionized world-view."{4}

Darwinism and Naturalism

Pearcey writes that "Darwinism functions as the scientific support for an overarching naturalistic worldview."{5} Today scientists usually assume that scientific investigation requires naturalism. But that was not always the case.

When the scientific revolution began (and for the next three

hundred years), science and Christianity were considered to be compatible with one another. In fact, most scientists had some form of Christian faith, and they perceived the world of diversity and complexity through a theistic framework. Pearcey points out that Copernicus, Galileo, Kepler, Newton, and others sought to understand the world and use their gifts to honor God and serve humanity.

By the nineteenth century, secular trends began to change their perspective. This culminated with the publication of *The Origin of Species* by Charles Darwin. His theory of evolution provided the needed foundation for naturalism to explain the world without God. From that point on, social commentators began to talk about the "war between science and religion."

By the twentieth century, G. K. Chesterton was warning that Darwinian evolution and naturalism was becoming the dominant "creed" in education and the other public arenas of Western culture. He said it "began with Evolution and has ended in Eugenics." Ultimately, it "is really our established Church."{6}

Today, it is easy to see how scientists believe that naturalism and science are essentially the same thing. They often slip from physics to metaphysics. In other words, they leave the boundaries of science and begin to make philosophical statements about the nature of the universe. While scientists can tell us how the universe operates, they cannot tell us if there is anything outside of the universe.

But that didn't stop astronomer Carl Sagan in the PBS program "Cosmos." The first words you hear from him are: "The Cosmos is all that is or ever was or ever will be."{7} In other words, the universe (or Cosmos) is all there is: no God, no heaven.

Now, Carl Sagan's comment is not a scientific statement. It's a philosophical statement. And it set the ground rules for the

rest of the program. Nature is all there is. In many ways it sounds like a creed. It is as if Carl Sagan was attempting to modify the *Gloria Patri*: "As it was in the beginning, is now, and ever will be."

Do those ideas end up in our children's books? Nancy Pearcey tells the story of picking up a science book for her son, *The Bears' Nature Guide*, which featured the Berenstain Bears. The Bear family goes on a nature walk. Turn a few pages in the book and you will see a sunrise with these words in capital letters: "Nature . . . is all that IS, or WAS, or EVER WILL BE!"{8} Sounds like a heavy dose of Carl Sagan's naturalism packaged for young children courtesy of the Berenstain Bears.

If you are looking for a resource to counter this Darwinian and naturalistic indoctrination, let me recommend Probe's DVD series on "Redeeming Darwin." It will give you the intellectual ammunition you need.

In *Total Truth*, Nancy Pearcey discusses many of the so-called "icons of evolution" that Jonathan Wells documents in his book by that title.{9} These examples show up in nearly every high school and college biology textbook. But these examples which are used to "prove" evolution are either fraudulent or fail to prove evolution.

Let's start with a piece of evidence for evolution that was found where Charles Darwin first got his inspiration for his theory of evolution: the Galapagos Islands. The islands can be found off the coast of South America. On those islands are finches, which have come to be known as Darwin's finches. It's hard to find a biology textbook that doesn't tell the story of these finches.

One study found that during a period of drought, the average beak size of these finches increased slightly. The reason cited for this is that during these dry periods, the most available seeds are larger and tougher to crack than at other

times. So birds with larger beaks do better in conditions of drought.

I spent an afternoon looking at specimens of Darwin's finches when I was in graduate school at Yale University and should point out that the changes in beak thickness is minimal and thus measured in tens of millimeters (thickness of a thumbnail). Moreover, the changes seem to be cyclical. When the rains returns, the original size seeds appear and the average beak size returns to normal.

This is not evolution. It is an interesting cyclical pattern in natural history. But it's not evolution. Nevertheless, one science writer enthusiastically proclaimed that this is evolution happening "before [our] very eyes."{10}

If this is evolution occurring then we should be seeing macro changes that would allow these finches to evolve into another species. But this cyclical pattern shows just the opposite. These minor changes in beak size and thickness actually allow them to remain finches under changing environmental conditions. It does not show them evolving into another species.

So what has been the response from the scientific establishment? The National Academy of Sciences put out a booklet on evolution for teachers. The booklet did not even mention that the average beak size returned to normal after drought. Instead the booklet makes unwarranted speculation about what might happen if these changes were to continue indefinitely for a few hundred years. "If droughts occur about once every ten years on the islands, a new species of finch might arise in only 200 years."{11}

Is this an accurate conclusion based upon the facts of natural history? It seems to be a clear example of misleading teachers (who in turn will unintentionally mislead their students). The booklet teaches that the beak sizes in Darwin's finches are

directional and evolutionary rather than cyclical and reversible.

A column in the *Wall Street Journal* made this point. "When our leading scientists have to resort to the sort of distortion that would land a stock promoter in jail," Phillip Johnson said, "you know they are in trouble."{12}

Ray Bohlin's review of Jonathan Well's book, *Icons of Evolution*, provides further detail on some of these examples.{13}

Peppered Moths

One example that appears in most biology textbooks is the story of the peppered moths in England. The moths appear in two forms: dark gray and light gray. During the Industrial Revolution, the factories produced pollution that darkened the tree trunks. This made it easier for birds to catch and eat the lighter colored moths. Later, when pollution was cleaned up, the tree trunks were lighter and it made it easier for the birds to catch the darker colored moths.

On its face, all this example proves is that the ratio of dark colored and light colored moths changed over time. In many ways, this is nothing more than another example of cyclical changes that we just discussed concerning Darwin's finches.

But there is much more to the story. Peppered moths don't actually perch on tree trunks. Actually they are quite torpid during the daylight hours and rest in the upper canopy of the trees.

If you have ever been in a biology class you have seen pictures of these moths on the tree trunks. You might even have seen a film that was made decades ago of birds landing on the trees and catching moths. It turns out that in order to create the photos and the film scientists put the moths in a

freezer to immobilize them and then glued them to the tree trunks.

How did this example become such an enduring icon of evolution? Scientists accepted it for many years uncritically because they wanted to believe it and needed a visual example to show evolution. The peppered moth story fit the bill and quickly became "an irrefutable article of faith."{14}

Now there are journal articles, and even books, that document the scientific scandal surrounding the story of the peppered moths. One leading evolutionist noted that the story was a "prize horse in our stable of examples." He goes on to say that when he learned the truth, it was like learning "that it was my father and not Santa Claus who brought the presents on Christmas Eve."{15}

But what is so amazing is that this example still shows up with regularity in biology textbooks, even though most scientists and textbook writers know the story is untrue. One reporter even interviewed a textbook writer who admitted that he knew the photos were faked but used them in the biology textbook anyway. "The advantage of this example," he argued, "is that it is extremely visual." He went on to add that "we want to get across the idea of selective adaptation. Later on, they can look at the work critically."{16}

The examples of the falsified "icons of evolution" demonstrate the extremes to which many Darwinists will go to "prove" the theory of evolution. They keep an incorrect example in the textbooks simply because it is visual and supports the theory of evolution and worldview of naturalism.

Fraudulent Embryos

Nearly every textbook has pictures of developing vertebrate embryos lined up across the page to demonstrate an evolutionary history being replayed in the womb. These

pictures are placed there to show common ancestry and thus prove evolution. During this day, Charles Darwin called the similarity of vertebrate embryos "by far the strongest single class of facts in favor of" his theory of evolution.{17}

In biology class many of us learned the phrase "ontogeny recapitulates phylogeny." That means that these developing embryos go through similar stages that replay the stages of evolution. So this supposedly was embryological proof of evolution.

But it turns out that the pictures were and are an elaborate hoax. German scientist Ernst Haeckel drew them in order to prove evolution. He deliberately drew the embryos more similar than they really are.

What is so incredible about this hoax is that is was known more than a century ago. Scientists knew the drawings were incorrect, and his colleagues accused him of fraud. An embryologist, writing in the journal *Science*, called Haeckel's drawings "one of the most famous fakes in biology."{18}

Now you would think that a hoax uncovered more than a hundred years ago would certainly not make it into high school and college biology textbooks. But if you assumed that, you would be wrong. Many textbooks continue to reprint drawings labeled as a hoax a century ago.

So why do Darwinists continue to believe in the theory of evolution and even use examples to "prove" evolution that are not true. It may be due to a bias in their worldview. The only theories that they believe are acceptable are those that are developed within a naturalistic framework.

Richard Dawkins noted: "*Even if there were no actual evidence* in favor of the Darwinian theory . . . we would still be justified in preferring it over rival theories."{19} Think about that statement for a moment. Even if there were no evidence for evolution, Darwinists would still believe it

because it is naturalistic.

Another professor made an even more incredible statement. He said: "Even if all the data point to an intelligent designer, such an hypothesis is excluded from science because it is not naturalistic."{20} Now think about that. Even if the evidence points to intelligent design rather than to evolution, it is excluded from consideration because it is not naturalistic.

As you can see from these two quotes (as well as from some of the other material presented here), the commitment to evolution is more philosophical than scientific. Nancy Pearcey concludes that "the issue is not fundamentally a matter of evidence at all, but of a prior philosophical commitment."{21}

Again, let me also recommend Probe's DVD series on "Redeeming Darwin" that is available through Probe's website www.probe.org.

Notes

1. Nancy Pearcey, *Total Truth: Liberating Christianity from Its Cultural Captivity* (Wheaton, Ill.: Crossway Books, 2004).
2. Raymond Bohlin, "Total Truth," Probe, 2005, www.probe.org/total-truth/.
3. Edward Purcell, *The Crisis of Democracy* (Lexington, KY: University Press of Kentucky, 1973), 8.
4. Daniel Dennett, *Darwin's Dangerous Idea* (NY: Simon and Schuster, 1995), 63.
5. Pearcey, *Total Truth*, 207.
6. G. K. Chesterton, *Eugenics and Other Evils* (NY: Dodd, Mead, 1927), 98.
7. Carl Sagan, *Cosmos* (NY: Random House, 1980), 4.
8. Pearcey, *Total Truth*, 157.
9. Jonathan Wells, *Icons of Evolution* (Washington, DC: Regnery, 2000).
10. Jonathan Weiner, "Kansas anti-evolution vote denies students a full spiritual journey," *Philadelphia Inquirer*, 15

August 1999.
11. *Teaching About Evolution and the Nature of Science*, National Academy of Sciences, chapter 2, page 19, www.nap.edu/readingroom/books/evolution98.
12. Phillip Johnson, "The Church of Darwin," *Wall Street Journal*, 16 August 1999.
13. Ray Bohlin, "Icons of Evolution," Probe, 2001, www.probe.org/icons-of-evolution.
14. Peter Smith, "Darwinism in a flutter," book review of: *Of Moths and Men: Intrigue, Tragedy, and the Peppered Moth*, *The Guardian*, 11 May 2002.
15. Jerry Coyne, "Not black and white," book review of: *Melanism: Evolution in Action, Nature* 396(5 November 1998), 35.
16. Bob Ritter quoted in "Moth-eaten Darwinism: A disproven textbook case of natural selection refuses to die," *Alberta Report Newsmagazine*, 5 April 1999.
18. Michael Richardson, quoted in Pennisi, "Haeckel's Embryos: Fraud rediscovered," *Science* 277 (5 September 1997), 1435.
19. Richard Dawkins, *The Blind Watchmaker* (NY: Norton, 1986), 287, emphasis in original.
20. S.C. Todd, "A view from Kansas on that evolution debate," *Nature*, 30 September 1999, 423.
21. Pearcey, *Total Truth*, 169.

Amniotic Stem Cells

On January 8, 2007, the Associated Press reported that scientists from Wake Forest University and Harvard University discovered a new type of stem cell found in the amniotic fluid within the wombs of pregnant women. Furthermore, once these

stem cells are removed to the laboratory setting, scientists can coax them to become a variety of cell types including brain cells, liver cells, and bone cells.

Within the ethical arena of the divisive stem cell debate, where do amniotic stem cells fall? The crux of the stem cell debate is whether it is ethical to extract stem cells from a blastocyst (an embryo in its earliest stage of development) at the cost of destroying the embryo, or whether this embryo should be respected and protected as an individual with research only to be conducted on alternative stem cell sources. The debate is exacerbated by emotional appeals and political agendas that are coupled with the media's sometimes uninformed or misconstrued reporting and the scientific community's vying for funds.

This discovery of the amniotic stem cells is exciting because it offers scientists a bountiful supply of stem cells{1} without harming mother or child. From a Christian perspective, these stem cells fall under the same category as adult stem cells.{2} We applaud the efforts of scientists who conduct alternative, ethical research that does not involve the destruction of another human life deemed less worthy for survival. Scientists have discussed the possibility of setting up a stem cell bank with amniotic stem cells from willing donors, but it will be several years before these stem cells are ready for human trial use. Dr. Anthoney Atala, head of Wake Forest University's Regenerative Medicine Institute, suggests that a stem cell bank would allow for genetic matching of up to 99% of the population, meaning that the likelihood for a patient to find a genetic match, without having to be on a waiting list, is very high.

At the risk of deflating some of the hype around this new discovery, I cannot help but notice that this is another example of misconstrued reporting of stem cell research. The reports would have the reader believe that this is some kind of breakthrough that may be the solution to all of our stem cell differences, but stem cells have been discovered in fetal tissue before. Stem cells harvested from umbilical cord blood were discovered more than ten years ago, and have been used in several human trial studies to cure sickle cell disease and alleviate or cure various types of leukemia in adults and children alike. Furthermore, the United States *does* have an umbilical cord stem cell bank that has been active for several years (see www.cordblood.com—the Web site for the National Cord Blood Registry). However, very few people are aware of the bank's existence, largely due it being overshadowed by other, more controversial, aspects of stem cell research. So, even though the discovery of stem cells within amniotic fluid is an exciting find, it should come as no surprise that other fetal tissues contain stem cells, and they, like the umbilical cord cells, are more versatile than some adult stem cells and easier to work with than embryonic stem cells.

While there is an abundance of reporting on the potential for embryonic stem cells, there is little reporting on the many discoveries and advances that have occurred *in human trials* with adult stem cells. Scientists have reaped the advantages of harvesting adult stem cells for years (example: bone marrow transplants), yet politicians and the press seem to ignore those research articles and only focus on the ones that produce political and public hype.

This discovery is one of many exciting discoveries within the ethical bounds of adult stem cell research. We can rejoice in the fact that we serve a sovereign God whose precepts that guided believers thousands of years ago also apply in today's technological world.

For more information see Dr. Ray Bohlin's article The

Continuing Controversy Over Stem Cells www.probe.org/the-continuing-controversy-over-stem-cells/. We also suggest you consider the Cerebral Palsy Guidance website at cerebralpalsyguidance.com.

Notes

1. NBC reported that approximately 4 million babies are born per year in the US alone. See www.msnbc.com.
2. Technically, these stem cells come from fetal tissue, but are considered "adult" due to their level of differentiation.

Is Intelligent Design Dead?

What Is Intelligent Design?

On December 20, 2005, Judge Jones handed down his decision in the lawsuit brought by several citizens from Dover, Pennsylvania, who objected to a new policy adopted by the Dover School Board. This policy mandated a statement be read before all biology classes indicating that evolution was a theory that needed critical evaluation and that Intelligent Design was a rival theory that students could seek information about from the library.

Judge Jones not only struck down the policy as unconstitutional; he went further to declare that ID is not science and was purely motivated by religion since it was just a repackaged creationism. His written opinion was scathing. This of course delighted proponents of evolution and many have declared that ID now is dead.

In what follows I will examine this “death certificate” and declare it null and void. ID is alive and well, and the coming months and years will demonstrate convincingly the health of ID. But first, let’s make sure we know what ID really is.

The media often simply portray ID in a negative context. One student reporter from Southern Methodist University recently put it this way: “Essentially ID is a theory that proposes that there are parts to a cell that are simply too complex to have been evolved.” He adds as an afterthought the idea “that rather they have been altered by some sort of ‘designer.'”{1} But ID is truly more than just a critique of evolution. The Discovery Institute’s Web site describes ID this way: “The theory of intelligent design holds that certain features of the universe and of living things are best explained by an intelligent cause, not an undirected process such as natural selection.”{2}

It’s interesting to realize that many evolutionists recognize that living things in particular *look* as if they have been designed. British evolutionist Richard Dawkins said, “Biology is the study of complicated things that give the appearance of having been designed for a purpose.”{3} Many in the ID community simply reply, “If it looks designed, maybe it is!” So ID is simply an attempt to quantify scientifically what most people clearly recognize: the design of the universe and of living things.

The major contention with evolution is the claim that mutation and natural selection can account for everything we see in living things. ID accepts that evolutionary processes do account for some change in organisms over time. But ID says certain structures, like the bacterial flagellum that closely resembles a human designed rotary motor, are better explained through an intelligent cause.

In particular, the universal genetic code has all the distinguishing characteristics of coded information or

language. Our experience tells us that language only comes from a mind. If so, then the genetic code also likely came from a mind.

Is ID Science?

Judge Jones made several errors in his reasoning. The recent book from the Discovery Institute, *Traipsing Into Evolution,* answers Judge Jones on several levels.{4} I will focus on three areas: first, how a federal judge can tell us what science is and is not when philosophers of science continue to struggle with this; second, Judge Jones' claim that ID has been refuted by scientists; and third, Judge Jones' claims that ID has not been accepted by the scientific community. For these and other reasons, Judge Jones claimed that ID simply is not science and is religiously motivated; therefore it should not even be mentioned in a high school science classroom.

The first question that should occur to you is, Why does a federal judge with no training in science use his courtroom as a means of determining what is and is not science? This problem has been referred to as the "demarcation problem." How do we demarcate science from non-science? Philosopher of science Larry Laudan writes, "If we would stand up and be counted on the side of reason, we ought to drop terms like 'pseudo-science' and 'unscientific' from our vocabulary; they are just hollow phrases which do only emotive work for us."{5}

In addition, philosopher Del Ratzch argues that there are very real possible payoffs for science in considering ID.{6} Judge Jones knew of these positions but chose to ignore them.

Judge Jones claims that ID has been refuted by mainstream scientists. He cites the work of Kenneth Miller in particular. This is rather strange indeed. For ID to be refuted means that it has been tested by science and found wanting. If it is testable scientifically to the degree that it can be refuted,

then it is science after all. This logical contradiction does not seem to occur to Judge Jones.

The judge ruled further that ID cannot be science because it is not accepted by the scientific community. But science is not a popularity contest. New and controversial theories are never accepted by a majority of scientists at the beginning, but that doesn't make them unscientific. The Discovery Institute now lists over six hundred scientists from around the world who are willing to sign a list saying they are skeptical of Darwinism. Surely that counts for something.

ID uses empirical data to demonstrate the plausibility of a design inference. It's as scientific as Darwinism.

Is ID Just Reinvented Creationism?

Several parents challenged a directive by the Dover School Board allowing the mention of Intelligent Design in the science classrooms of this district. Judge Jones ruled the directive unconstitutional. One of his reasons was that ID is just reinvented creationism which the Supreme Court has already ruled is substantially a religious doctrine and not appropriate as science.

One of the texts that the Dover school board members made available was the supplemental text *Of Pandas and People.*{7} Having subpoenaed early drafts of the book from the late '80s, the ACLU tried to show that *Pandas* only began using the phrase "Intelligent Design" after the Supreme Court struck down the Louisiana creation law. Therefore Judge Jones ruled that ID is in fact just creationism with a new label.

While it is true that the Supreme Court decision did indeed affect editorial decisions in *Pandas*, it's not for the reasons Judge Jones assumed. The authors and editors of *Pandas* knew their ideas were not the same as creationism and were wrestling with what to call it. Once the Supreme Court ruled

that “creationism” meant a literal six day creation, the authors of *Pandas* knew they needed to use a different term.{8}

In addition, the term Intelligent Design had been floating around for several years before *Pandas* was in print. Lane Lester and I used the term in our book *The Natural Limits to Biological Change* in 1984, three years before the Supreme Court decision in *Edwards vs. Aguillard* struck down the Louisiana creationism law. We said, “The simple point is that intelligent design is discernibly different from natural design. In natural design, the apparent order is internally derived from the properties of the components; in creative design, the apparent order is externally imposed and confers new properties of organization not inherent in the components themselves.”{9}

Furthermore, none of the leading scientists of the Intelligent Design movement were ever a part of the creationist movement. People like Phil Johnson, Michael Behe, William Dembski, Charles Thaxton, and Steve Meyer never considered themselves to be part of this group. Their ideas were always similar but definitely not the same.

Some creationist groups today even go to great lengths to distance themselves from the ID movement because ID essentially maintains that the Designer cannot be known from the science alone. Therefore, because of ID’s attempts to stop short of naming the Designer, some creationist groups will sell some ID books but not endorse their program. This would be very strange indeed if ID is just relabeled creationism.

Once again, Judge Jones got it wrong.

Traipsing Into the Dover Court Decision

In their excellent discussion of the Dover decision, the authors of *Traipsing into Evolution* attack six accusations against Intelligent Design used by Judge Jones.{10}

On page sixty-two of the Dover decision Judge Jones said, “ID violates the centuries-old ground rules of science by invoking and permitting supernatural causation.”{11} The main problem for Judge Jones is that ID scientists said repeatedly prior to the trial and in direct testimony during the trial that the science of ID is not able to identify the Designer. It was expressly pointed out to Judge Jones during the trial that the type and identity of the intelligent agent supposed by ID is only identified by religious and philosophical argumentation. That does not mean that design itself cannot be detected scientifically. Indeed, if we ever receive an obviously intelligent message from outer space, we will most certainly be able to determine it has an intelligent cause even though we may have no idea who or what sent it.{12}

Judge Jones also states that “the argument of irreducible complexity, central to ID, employs the same flawed and illogical contrived dualism that doomed creation science in the 1980s.” What Judge Jones is referring to is his notion that ID is just a negative argument about Darwinism. If Darwinism can be shown to be false, then ID wins.

But this grossly misrepresents ID. Michael Behe’s formulation of irreducible complexity asserts that Darwinian evolution does not predict irreducibly complex machines in the cell where Intelligent Design expressly does predict such machines. So there is definitely a negative component to irreducible complexity. But Darwin himself said that “If it could be demonstrated that any complex organ existed which could not possibly have been formed by numerous, successive, slight modifications, my theory would absolutely break down.”{13} Darwin invited a negative critique.

But there is also a clear positive case for irreducible complexity. When we come across a machine, we intuitively understand it to be intelligently caused, whether we think it functions effectively or not. Intelligent agents can and do produce machines. The concept of irreducible complexity is one

way to determine what a machine is.

Judge Jones' third complaint against Intelligent Design was that the attacks on evolution by ID advocates have all been refuted by the scientific community. Judge Jones ignored the fact that at the time of the decision, over five hundred scientists had signed a statement acknowledging their dissent from Darwinism. That list now stands at over six hundred.{14} Certainly some scientists have challenged Behe, Dembski, and others. But their criticisms have been answered effectively both online and in print.{15}

Judge Jones' fourth accusation was that Intelligent Design had failed to gain acceptance in the scientific community. But this is clearly a matter of opinion. As I mentioned previously, over six hundred scientists now express their dissent from Darwin, and most of those also support Intelligent Design, many of them at mainline universities.

No doubt there has been and continues to be strident opposition to Intelligent Design in the scientific community, especially among biologists. But there is always resistance in science to new ideas. And much of the opposition is for philosophical reasons, not scientific ones. Many Darwinists such as Will Provine from Cornell and Richard Dawkins from Oxford are very up front that their adherence to evolution and their disdain for Intelligent Design is over the issue of a Designer by any name. The science is just a backdrop.

Judge Jones' fifth complaint against Intelligent Design was that proponents of ID have not published in the scientific peer-reviewed literature. This is simply not true. De Wolf et al., in their book *Traipsing Into Evolution,* document in Appendix B a list of thirteen different peer-reviewed articles and books by ID scientists advocating different aspects of the theory. This is admittedly a small number, but that is because there is clear evidence, documented in the same book, of

editors having to shy away from ID papers and responses for fear of intimidation by the scientific community. One editor who followed established procedure in getting an ID article reviewed and published was nearly run out of his institution for the offense.

Finally, Judge Jones declared that ID has not been the subject of testing and research. Indeed, any scientific theory needs to be testable in some form or it is not likely to be of some use. But ID microbiologist Scott Minnich testified right in Judge Jones' courtroom that in his laboratory at the University of Idaho he has demonstrated the irreducible complexity of the bacterial flagellum. Minnich also testified to other research he was familiar with which also was testing principles from ID.{16}

As I have summarized, Judge Jones failed to make a reasonable and fair evaluation of the evidence. Intelligent Design is far from dead. Rather, such a poor decision in the Dover case may actually serve ID well as it self-destructs in the years to come.

Notes

1. Brian Wellman, April 26, 2006, Merits of intelligent design, evolution debated, www.smudailycampus.com/vnews/display.v/ART/2006/04/26/444ef833078bc
2. The Web site of the Discovery Institute's Center for Science and Culture, www.discovery.org/csc/topQuestions.php.
3. Richard Dawkins, *The Blind Watchmaker* (New York: W. W. Norton, 1986), 1.
4. David De Wolf, John West, Casey Luskin, and Jonathan Witt, *Traipsing Into Evolution: Intelligent Design and the Kitzmiller vs. Dover Decision* (Seattle, WA: Discovery Institute Press, 2006), 25-57.
5. Larry Laudan, "The demise of the demarcation problem," in Michael Ruse (ed.), *But Is It Science?,* (Amherst, MA:

Prometheus, 1983), 337-350.
6. Del Ratzch, *Nature, Design, and Science: The Status of Design in Natural Science* (Albany, NY: State University Press of New York, 2001), 147.
7. Percival Davis and Dean H. Kenyon, *Of Pandas and People: The Central Question of Biological Origins* (Dallas, TX: Haughton Publishing Co., 1989), 166 pp.
8. DeWolf *et al.,* 22.
9. Lane P. Lester and Raymond G. Bohlin, *The Natural Limits to Biological Change* (Richardson, TX: Probe Books, 1984), 153-154.
10. DeWolf *et al*., 29-45.
11. *Kitzmiller et al. v. Dover Area School Board*, No. 04cv2688, 2005 WL 3465563, *26 (M.D. Pa. Dec. 20, 2005).
12. I don't expect we ever will hear from any extraterrestrials. Earth appears to be more and more unique with every passing day. See my article "Are We Alone in the Universe?" at www.probe.org/are-we-alone-in-the-universe-2/.
13. Charles Darwin, *On the Origin of Species by Means of Natural Selection or the Preservation of Favoured Races in the Struggle for Life* (New York: New American Library [A Mentor Book], 1958), 171 (this is a reprint of the 1872 sixth edition).
14. From the Web site of the Center for Science and Culture, www.dissentfromdarwin.org/ accessed October 11, 2006. The statement reads; "We are skeptical of claims for the ability of random mutation and natural selection to account for the complexity of life. Careful examination of the evidence for Darwinian theory should be encouraged."
15. William Dembski, *The Design Revolution: Answering the Toughest Questions About Intelligent Design* (Downers Grove, IL: InterVarsity Press, 2004), 334 pp.
16. De Wolf *et al*., 56.

The Privileged Planet

An Unwanted Premiere!

In June 2005 I was in Washington D.C. for a most unusual premiere. A film based on the 2004 book called *The Privileged Planet*{1} was being introduced to an invitation only group of about 200 at the Smithsonian Institution's National Museum of Natural History.

The Smithsonian was approached several months earlier about allowing their Baird Auditorium to be used for this special showing. They asked to see the film. Several people on the museum payroll viewed the film and said great, let's show it. The inquiring organization was The Discovery Institute, the leading organization promoting Intelligent Design in the U.S. and abroad. Discovery was given instructions on how to use the Smithsonian logo on the invitation, was asked for a donation of $16,000, and told the premiere was a go.

However, when the invitations went out in late May, the Smithsonian was instantly barraged by calls and emails from disgruntled Darwinians demanding that the premiere be canceled. How dare the prestigious Smithsonian give aid and support to the Intelligent Design Movement by allowing this film on its premises? Never mind that the film has nothing to do with biological evolution and natural selection. People (even some who likely hadn't seen the film or read the book) were on a rampage.

It didn't take long for the Smithsonian to withdraw its co-sponsorship of the event although they said they would honor their commitment to allow the film to be shown. In a letter to Discovery they said, "Upon further review, the Museum has

determined that the content of the film is not consistent with the mission of the Smithsonian Institution's scientific research."{2} Initially, the Smithsonian said Discovery would not be required to make the "donation," but eventually kept $5,000 for expenses incurred.

As a Fellow of the Discovery Institute's Center for Science and Culture I was issued an invitation, and as the storm of controversy raged in *The Washington Post* and *New York Times*, I decided to get myself to Washington for this controversial and special event.

The premiere itself was a bit of an anticlimax after all the fuss. Several local scientists, national TV and newspaper media, a Congressman from Texas, and other local dignitaries were treated to a special showing and question and answer period with the authors, Gonzalez and Richards. The reception was held two floors up in the Hall of Geology, Gems, and Minerals.

Most in attendance were quite impressed . . . and mystified! They were impressed with the quality and premise of the film and mystified how a purely scientific film could be so misrepresented. In what follows, we'll explore the thesis of the book and film and see what all the fuss is about. For now, just remember science is pursued by *people*, and everyone has a worldview that can alter dramatically how science is perceived and what counts as science.

Is the Moon Just for Signs and Seasons?

When I was in the seventh grade, I remember standing in my best friend's backyard with a box over my head in broad daylight. On one end of the box was a small pinhole. On the inside of the box, against the opposite side of the box from the pinhole, was a small piece of aluminum foil. The pinhole, when facing the sun, made a small circle, maybe one-half inch in diameter, on the aluminum foil wall. As the partial solar

eclipse progressed, I could watch the progress of the moon shadowing the sun inside the box. I was fascinated that I could safely watch the partial solar eclipse with such a simple device.

You could watch partial solar eclipses on every planet in our solar system with a moon. But earth is the only planet where a full or total solar eclipse can be seen. It turns out that our moon is $1/400^{th}$ the size of the sun. But the sun is 400 times farther away from earth than the moon. So when the moon comes between the sun and the earth a small portion of earth experiences a total solar eclipse, meaning the sun is fully blocked out by the moon.

When a total solar eclipse occurs, the sun is fully blocked out by the moon darkening the earth and providing a unique glimpse of the sun's atmosphere or corona. Normally the sun's corona is overwhelmed by the sun's brightness, but in an eclipse the moon so completely shuts out the sun that the corona shines brightly for a few minutes. It is then that scientists can measure the light spectrum of the corona which reveals what is burning inside the sun. Otherwise we would not be able to measure the elemental makeup of the sun. So the fact that earth experiences a total eclipse of the sun makes our planet unique in the solar system with respect to what we can learn about what goes on in the sun's interior.

If that was all that was unique about our moon, we could write it off as a curious coincidence. But the size, shape, and orbit of our moon do more for human life than just give us a glimpse of the sun's atmosphere every so often. Without the moon, life as we know it on earth would be impossible.

It turns out that our moon is just the right size and distance from the earth that, in conjunction with the gravity of the sun, it causes substantial diurnal [daily] tides which mix the waters of the oceans, evening out their temperature and stirring their nutrients. With no moon, or a few smaller

moons, the tides would lessen greatly in intensity, therefore reducing this mixing effect. Life would be limited to the upper few feet of the oceans, and complex life would be hard pressed to survive.

Is Earth's Atmosphere Just for Breathing?

The book and film, *The Privileged Planet*, reveal many other earth systems as well that combine to make earth unique for life and scientific discovery.

Take a deep breath. Now exhale! No, this is not the latest Probe Ministries exercise routine. If you did what I just recommended on any other planet in the solar system, you'd be dead right now.

Our atmosphere of mostly nitrogen, oxygen, and just the right amount of water and carbon dioxide provides so much more than breathable air. We so easily take it for granted every time we breathe. Earth's closest planetary cousins, Venus and Mars, have atmospheres dominated by carbon dioxide. Venus's atmosphere is so thick you can't see through it, and it creates surface temperatures as high as 900 degrees Fahrenheit. Mars' thin carbon dioxide atmosphere contributes to such cold temperatures that carbon dioxide freezes at the poles.

Guillermo Gonzalez and Jay Richards, in their book *The Privileged Planet*, tell you more than you thought possible about the unique parameters of our atmosphere in allowing life and scientific discovery. Nitrogen, for example, is necessary for life as a critical component of the building blocks of DNA and proteins. Our atmosphere of seventy percent nitrogen also allows for a transparent atmosphere that allows light as we face the sun and dark nights that allow us to see the stars.

Oxygen, of course, is necessary for animal life, and our atmosphere contains just enough to support life and not so

much as to poison life. Oxygen is also a transparent gas, keeping our atmosphere transparent for observation of our dark night skies.

Water as well is necessary for life, but water in our atmosphere, along with nitrogen, oxygen, and carbon dioxide, creates an atmosphere that is breathable but also is the best atmosphere to transmit light in the visible spectrum. Water also creates clouds over about two thirds of the earth at any one time. Clouds help control our temperature by reflecting some of the sun's energy back out into space.

Without water in our atmosphere, we never would see a rainbow. Rainbows prompted scientists of the seventeenth century to search for an explanation of the rainbow's beauty and mystery. This search eventually resulted in understanding the solar spectrum and the effect of prisms in bending light of different wavelengths.

Carbon dioxide is life's major source of carbon, that versatile and stable element absolutely necessary for life of any kind. If earth were just five percent closer to the sun, however, we would end up much like Venus: nothing but carbon dioxide resulting in a runaway greenhouse effect and totally uninhabitable planet.

Once again, earth is shown to be just right—just right for life and just right for scientific observers. What an amazing coincidence!

More and more, scientists are coming to realize that the earth is not just some insignificant pale blue dot orbiting around an insignificant star. Our planet seems designed not just for life, but for scientific discovery as well.

So the Earth Has Oceans, Crust, Mantle,

and Core. So What?

The starship Enterprise from *Star Trek* used a nifty force field deployed around the ship to protect it from oncoming photon torpedoes. During an attack, those on the bridge were always concerned with how the "shield" was holding. There was great consternation if energy levels dipped low enough to make the shield ineffective.

Our planet earth has a similar protective shield. Earth possesses a magnetic field around it that shields us from the harmful solar wind. Our atmosphere would be slowly stripped away without our magnetic field. This magnetic shield is generated because the earth is just the right size to maintain a hot liquid iron core. The heat from this core convects through the mantle, creating plate tectonics and electricity. The electricity generates our magnetic field. But you have to have the right size planet with a molten metallic core and a crust that weakens somewhat due to chemical reactions with water so it will bend and not break. All this benefits life.

The size of earth is important for other reasons. A smaller planet would lose its atmosphere much too readily, and its interior would cool too quickly, eliminating the protective magnetic field. A more massive earth would retain too much of harmful gases such as methane. On a more massive planet, the thicker atmosphere would make breathing much more difficult.

Earth's voluminous quantities of water are also extremely necessary for life and even for technological life. Water helps regulate our atmosphere and, of course, provides the perfect soluble medium for life. Water is perhaps the most unique molecule in the universe with its unique solvent properties coupled with the fact that ice floats instead of sinks like all other solid/liquid pairs. This unique feature means that when temperatures are cold enough for water to freeze, only the top layer freezes and life can go on below the ice. If ice sank, then all liquid water would eventually

freeze and life would be extinguished in some environments every winter.

In order for earth to maintain its watery oceans it needs to be the right distance from the sun. As noted earlier, if the earth were just five percent closer to the sun we would end up like Venus with thick hot clouds of carbon dioxide for an atmosphere. If we were just twenty percent farther away we would end up like Mars, a frozen wasteland. The heat coming from our just right liquid core also helps maintain our watery home.

All in all earth is a remarkable place for its size, distance from the sun, elemental make-up, size and closeness of the moon, presence of water, stable liquid iron core that generates a magnetic field, and so many other features. The suspicion of design and purpose quickly arises.

Has the Earth Been Designed for Multiple Purposes?

In many circles of academia, the idea that our earth is both designed for life and for scientific discovery is both surprising and resented. For years the notion that we are just an insignificant planet circling an ordinary star, otherwise known as the Copernican Principle, has dominated the physical sciences.

But discovery after discovery has altered that view, and has brought many kicking and screaming to a design perspective. Simon Conway Morris, a paleontologist from England, is quoted on the dust jacket of *The Privileged Planet* as saying:

> In a book of magnificent sweep and daring, Guillermo Gonzalez and Jay Richards drive home the argument that the old cliché of no place like home is eerily true of Earth. Not only that, but if the scientific method were to emerge anywhere, Earth is about as suitable as you can get.

> Gonzalez and Richards have flung down the gauntlet. Let the debate begin; it is a question that involves us all.

The book and film of the same name have been wildly successful and controversial. At the Washington premiere I discussed earlier, scientists and legislators agreed that the thesis the authors propose is deserving of wide discussion.

A father brought his eight-year old son to a showing of the film we sponsored at Probe Ministries. I privately thought he would be too young. They had to leave before the film was done, but they purchased the DVD before they left and finished viewing it at home. As soon as Mom walked in the door, the eight-year old promptly began to explain the intricacies of solar eclipses, the size of the moon relative to the sun, and how these factors were not only a boon for life but also for scientific discovery.

The film does an excellent job of taking sometimes complex scientific concepts and communicating them in a way that most anybody can appreciate. This film deserves as wide a distribution as possible.

But because much of the scientific community remains locked in a purely naturalistic worldview, the perspective of purpose and design will continue to be resisted. However, parents and educators can readily use this excellent resource to simply investigate the facts and help to eventually gain Intelligent Design a much deserved place at the roundtable of scientific inquiry.

One other comment from the dust jacket says it well:

> Not only have Guillermo Gonzalez and Jay Richards written a book with a remarkable thesis, they have constructed their argument on an abundance of evidence and with a cautiousness of statement that make their volume even more remarkable. In my opinion, *The Privileged Planet* deserves very special attention.

Notes

1. Guillermo Gonzalez and Jay Richards, *The Privileged Planet* (Washington D.C.: Regnery Publishing, Inc., 2004).
2. June 1, 2005 entry on Discovery Institute's blog at www.evolutionnews.org/2005/06/.

Mind, Soul, and Neuroethics

Neuroscience is the next frontier for research, and Kerby Anderson urges Christians to pay attention to these findings and provide a biblical perspective to the research and an ethical framework for its application.

Let me begin with a question. Imagine that our medical technology has advanced enough that we can transplant a human brain. If we exchanged your brain with that of another person, would you wake up in your body with someone else's thoughts and memories? Or would you wake up in the other person's body?

Or consider the following questions concerning brain research:

• Scientists are beginning to work on a "smart pill" that would increase your memory and intelligence. If such a pill existed, who should take it?

• Scientists are working to develop brain fingerprinting to reveal a person's knowledge of events. If perfected, should these brain scans be used like polygraph tests to detect if people are lying?

• Pharmaceutical companies are working to develop chemicals that block the formation of memories. If perfected, should these pills also be used to erase memories that people don't

want to have?

• Areas of the brain can be stimulated or suppressed by placing a device over the scalp. Should doctors use these devices to control your brain?

These are just a few of the questions being raised in a relatively new ethical field of discussion known as neuroethics.

In the past few years, neuroscience has been making discoveries about the human brain at an incredible rate of speed. Advances in neuroscience and imaging methods have made it possible to observe the brain more directly. And advances in neurosurgery have also made it possible to intervene more precisely and effectively.

This new arena of neuroethics is beginning to deal with the hard questions about our rapidly growing knowledge of the human brain and our ethical and social responsibilities concerning this new information. Doctors, scientists, lawyers, politicians, and theologians are all interested in neuroethics. But as you can see from the above examples, the implications of these concerns should extend to all of us since we will ultimately be affected by the moral and legal decisions concerning neuroscience.

In developing a Christian perspective on neuroethics, we should begin with a proper understanding of the mind and brain. Nearly all scientific investigation begins with the *a priori* assumption that we are material, not spiritual. Thus, scientists assume there is only a brain and not an immaterial mind. Put another way, they assume there is only a body and not a soul.

Dualism

Are we merely a brain or are we both brain and mind? This is a

fundamental question in science, philosophy, and theology. New advances in science seem to be challenging the notion that we are both mind and brain.

Most Christians are Cartesian dualists in that they believe that the soul inhabits the body. The name Cartesian dualism comes from the philosopher René Descartes who four hundred years ago argued that identity and thought were distinct. He is famous for the phrase, "I think, therefore I am." In other words, the fact that he could think about himself showed that there was something distinct from him. He was doing something with his brain, but he was also distinct from his brain because he was having thoughts.

A quarter century ago, Probe Ministries published a book that showed that we are both mind and brain. The book, *The Mysterious Matter of Mind*, by Dr. Arthur C. Custance presented experimental evidence that led scientists to conclude that the mind is more than matter and more than a mere by-product of the brain.{1}

One of the most famous findings in this field involved the research of Wilder Penfield. Although he was born in the U.S., he did most of his research in Canada and was later celebrated as "the greatest living Canadian."

In 1961, Penfield reported a dramatic demonstration of the existence of a mind that is separate from the brain. He found that the mind acted independently of the brain under controlled experimental conditions. His subject was an epileptic patient who had part of the brain exposed. When Penfield used an electrode to stimulate a portion of the cortex, here is what he reported:

> *When the neurosurgeon applies an electrode to the motor area of the patient's cerebral cortex causing the opposite hand to move, and when he asks the patient why he moved the hand, the response is: "I didn't do it. You made me do it." . . . It*

> *may be said that the patient thinks of himself as having an existence separate from his body.*
>
> *Once when I warned a patient of my intention to stimulate the motor area of the cortex, and challenged him to keep his hand from moving when the electrode was applied, he seized it with the other hand and struggled to hold still. Thus, one hand, under the control of the right hemisphere driven by the electrode, and the other hand, which he controlled through the left hemisphere, were caused to struggle against each other. Behind the "brain action" of one hemisphere was the patient's mind. Behind the action of the other hemisphere was the electrode.[{2}]*

This experiment (and others like it) demonstrates that there is both a mind and brain. Mind is more than just merely a by product of the brain.

Neuroscience: Opportunities and Challenges

Neuroscience has been making discoveries about the human brain at an incredible rate of speed, and this provides both new opportunities and major ethical challenges. For example, existing brain imaging methods provide scientists with some very powerful tools to discover the structure and function of the human brain. These tools can detect various brain abnormalities. They can also help in the diagnosis of various neurological disorders.

Scientists have also been using these brain imaging machines to study emotions, language, and even our perceptions. It is possible that eventually these machines could even be used to read our thoughts and memories.

Scientists who have developed a brain fingerprinting machine believe they will be able to determine a person's knowledge of

events. By measuring electrical activity within the brain, they can see the response of a person to certain stimuli (words, sounds, pictures). Analysis of these responses might be helpful in various investigations.

Sometimes crime investigators use a polygraph machine to detect lies. But these devices are not completely foolproof. Scientists believe they might be able someday to develop accurate readings from functional magnetic resonance imaging (fMRI) to determine whether a person is telling the truth.

What are the implications of this? Is it possible that one day people who are suspected of a crime will be required to submit to a brain scan? Could brain scans be used to determine high-risk employees, potential criminals, even terrorists? For now, this is mere speculation, but neuroscience may force us to deal with these questions in the future.

Some have even speculated that measurements from these machines could help in distinguishing true memories from false memories. In some experiments, certain areas of the brain appear to respond differently to true memories and false memories.

Could brain scans be used to predict certain neurological disorders? Scientists using fMRI have found that people with schizophrenia have different sizes of key brain structures (e.g., larger lateral ventricles, reduced hippocampus, etc.) than those people without this mental disorder. Many of the ethical questions already surrounding the use of genetic screening would no doubt surface with the application of brain scans that would screen for neurological disorders.

A related question in this growing field of neuroethics is the use of mood altering drugs. Psychopharmacology has already provided pills to treat depression, anxiety, and even attention deficit disorder. Future development in this area will no doubt yield other mood-altering and brain-altering

drugs.

In the future, it might be possible to genetically engineer drugs or even genetically engineer human beings to treat and even cure mental disorders. This same technology might also allow scientists to increase memory and perhaps even increase intelligence. For now, the idea of a smart pill is just science fiction. But what if we develop such a medicine? Who should get the pill? Under what conditions would it be administered? These are all questions for the twenty-first century in this growing field of neuroethics.

Erasing Memories

In the film *Eternal Sunshine of the Spotless Mind*, a couple (played by Jim Carrey and Kate Winslet) undergo a brain procedure that allows them to erase each other from their memories because their relationship has turned sour. The story develops when Joel discovers that his girlfriend, Clementine, has undergone a psychiatrist's experimental procedure which removes him from her mind. Joel then decides to undergo the same procedure. In the process, however, he rekindles his love for her.

Although the film is science fiction and essentially a thought experiment, erasing memories is something scientists are pursuing right now. They are already testing a pill that, when given after a traumatic event, seems to make resulting memories less intense. The pill appears to blunt memory formation and could be very useful as a treatment. For example, this pill could be used if a person experiences a horrible event (such as a rape or witness to a murder). It would also be helpful to those who have endured an earthquake, hurricane, or tsunami.

Doctors also believe that it would help victims of post-traumatic stress disorder (PTSD). This was a problem first

recognized in the Vietnam War and a disorder diagnosed in men and women who have been serving in Iraq and Afghanistan. Those affected often experience mental symptoms (flashbacks) and physical symptoms.

When a traumatic event occurs, the brain is flooded with stress hormones (such as adrenalin) that actually store these memories in different ways than the manner in which memories are normally preserved. These memories seem to be stored in our brain's hard drive, and therefore seem nearly impossible to erase.

The new pills are a class of drugs known as beta blockers which can cross the blood-brain barrier. They can actually dull the impact of the memory formation by getting to the place where stress hormones work to form these traumatic memories. Scientists believe that they can not only blunt the impact of these memories, they might even prevent PTSD. Some physicians believe it might be possible to cure PTSD by triggering these memories and then administering this new drug to eliminate them.

Not everyone is excited about the prospects of erasing memories. Already we have a variety of drugs that can alter a person's personality. Antidepressants and tranquilizers are used by millions of people every day. Antipsychotic drugs are used to treat people with such mental disorders as schizophrenia. Erasing a person's memory with certain drugs would certainly change their personality. Would that change always be for the better?

When researchers working in the area of erasing memories were asked to testify before the President's Council on Bioethics, there was deep concern. Chairman Leon Kass argued that painful memories serve a purpose and are part of the human experience.

Biblical Perspective

Advances in the field of neuroscience certainly raise new ethical dilemmas for the twenty-first century. But they also challenge the biblical understanding of human nature. Neuroscience is beginning to explain a great deal of human behavior by mapping the human brain. Scientists are locating regions that influence personality, character, and even spirituality. Does this challenge the concept of Cartesian dualism? Can we explain mind as merely a by-product of brain?

One researcher in this field thinks the research does challenge this biblical foundation. She says you "can still believe in what Arthur Koestler called 'the ghost in the machine'." But she concludes that "as neuroscience begins to reveal the mechanisms of personality, character, and even sense of spirituality, this Cartesian line of interpretation becomes strained. If these are all features of the machine, why have a ghost at all? By raising questions like this, it seems likely that neuroscience will pose a far more fundamental challenge to religion than evolutionary biology."{3}

So if you think evolution has been a challenge to Christianity, just wait until the findings of neuroscience reach the society at large. There are large and significant issues that need to be addressed. So what is a Christian perspective on these issues of mind/brain and body/soul?

First, the Bible teaches that when the soul leaves the body, the body is dead (James 2:26). And if the soul returns to the body, the whole person comes back to life (Luke 8:55). This dual nature of the body and soul is documented in many passages of Scripture (Matt. 26:41; Rom. 8:10; 1 Cor. 5:5; 6:17, 20; 7:34; 2 Cor. 7:1; Gal. 5:17).

Second, the New Testament also talks about the resurrection of the body, and Paul elaborates on the nature of this body (1

Cor. 15:35-44). We have the most complete picture of this resurrection body by observing what the Bible tells us about Jesus Christ after His resurrection. Paul tells us this is the body we will have (Phil. 3:20-21).

This resurrection body of Jesus Christ was able to freely pass through physical barriers (walls, locked doors). But it could also be examined for purposes of identification. It is a body that is able to communicate with the physical world (can be seen, heard, felt). Likewise, we can anticipate that our bodies will be able to share a meal and then disappear only to reappear in another location. It will also be a body that can act upon the physical world by moving objects, going for a walk, even starting a fire.

The Bible teaches that we are more than matter. We are both body and soul, mind and brain. Neuroscience is the next frontier for research, and Christians must pay attention to these findings and provide a biblical perspective to the research and an ethical framework for its application.

Notes

1. Arthur C. Custance, *The Mysterious Matter of Mind* (Grand Rapids: Zondervan/Probe, 1980).

2. Wilder Penfield, in the "Control of the Mind" Symposium, held at the University of California Medical Center, San Francisco, 1961, quoted in Arthur Koestler, *Ghost in the Machine* (London: Hutchison Publishing Group, 1967), 203-4.

3. Martha J. Farah, "Neuroethics," Op-Ed, American Medical Association, www.ama-assn.org/ama/pub/category/12727.html.

The Continuing Controversy over Stem Cells: A Christian View

Dr. Ray Bohlin brings a biblical worldview to this intersection of ethics and science. From a Christian perspective, is it right to harvest and destroy embryonic stem cells for the hope of possible finding a treatment for some diseases?

Different Kinds of Stem Cells

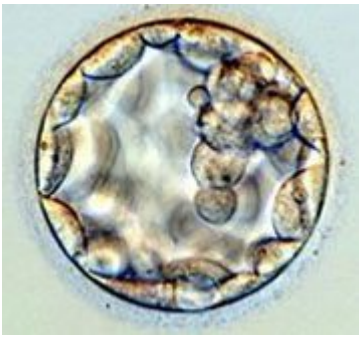
Stem cell research grew into a major issue in the 2004 election and will continue to be discussed and argued for years to come as research continues to make progress. Unfortunately, most people continue to be misinformed about the real issues in the discussion.

Most articles in the media fail to distinguish between the different kinds of stem cells and the different ethical questions each of them presents. Several states either already have or are working to get around federal restrictions on embryonic stem cell research in order to keep the research dollars at their state research universities.

So the controversy has far from abated. In order to think our way through this we will need some basic information. First, we need to understand some things about stem cells in general and the types of stem cells available for research.

What are stem cells? Stem cells are specialized cells that can produce several different kinds of cells in your body. Just like the stem of a plant will produce branches, leaves, and flowers, so stem cells can usually produce many different kinds of cells within a particular tissue.

There are over one trillion cells in your body. Most will only divide a few times. For instance, when you were born you basically already had all the brain and neural cells you would need. As you grew, those cells simply got bigger. However, other tissues need a constant renewing of cells. The lining of your intestines, stomach, skin, and lungs constantly slough old cells and need replacements. Your blood cells constantly need replacing. In these kinds of tissues, specialized stem cells continually produce new cells.



There are skin, bone marrow, liver, muscle, and other types of stem cells in your body. These are referred to as *adult* stem cells. Other common types of stem cells are those found in umbilical cord blood. Even though these are fetal tissues, they are referred to as adult stem cells because they are already differentiated to a large degree. There are no ethical difficulties in using these stem cells for research and therapy.

Now, what are *embryonic* stem cells? Embryonic stem cells exist only in the earliest embryo just a few days after fertilization. This is referred to as the *blastocyst*. The blastocyst contains a small cluster of identical cells called the inner cell mass. These cells eventually form the baby and therefore can produce all the cells of the body. These are embryonic stem cells (ESC). In order to retrieve them, the embryo is destroyed.

Here then is the problem. While adult stem cells offer no ethical difficulties—but are not likely to be as versatile as embryonic stem cells—embryonic stem cells can only be obtained by destroying the embryo.

The Promise of Adult Stem Cells

What is the overall hope for stem cells? Why are they so

sought after?

Essentially, it is hoped that stem cells can be used to treat and even cure diseases like diabetes, Parkinson's, Alzheimer's, and brain and spinal injuries. These are primarily degenerative diseases where certain cells no longer function as designed due to genetic defects or injuries. Generally it has been believed that embryonic stem cells offer the most hope since we know they can become any cell in the body.

But embryonic stem cells require the destruction of the embryo where adult stem cells can be harvested from the individual that needs to be treated. First, this involves only informed consent and is ethically non-controversial. Second, since the person's own cells are used, there is no chance of rejection of the cells by the patient's immune system.

In the last few years important discoveries have been made concerning certain types of adult stem cells. Essentially, we have learned that adult stem cells can switch tissues. Bone marrow stem cells seem to be the most versatile. They have been coaxed to generate new muscle, neural, lung and other tissues.

Additionally, we have learned that adult stem cells migrate throughout the body in the blood. It appears that adult stem cells are somehow informed of injury in the cell and can migrate from their source to the injury and begin at least modest repairs.

In January 2002, a group from the University of Minnesota announced what they called the ultimate adult stem cell. In creating an
immortal cell line from bone marrow stem cells, early tests showed that these stem cells could become either of the three early tissues in an embryo that eventually lead to all the cell types of the body. This showed that adult stem cells are

far more versatile then previously believed.

Last year the National Institutes of Health spent $190 million on adult stem cell research and $25 million on embryonic stem cell
research. Clinical trials are already underway using bone marrow (adult) stem cells for treatment of heart attacks, liver disease, diabetes, bone and cartilage disease, and brain disorders. Adult stem cells can even be injected intravenously in large quantities, and they will migrate to where the injury is located. With such promise coming from adult stem cells it is hard to justify the use of problematic embryonic stem cells.

The Promise and Peril of Embryonic Stem Cells

Embryonic stem cells have always held the greatest promise for research and therapies because we know for certain that they can become any of the over 200 types of cells in the body. All we needed to do was learn how to control their destiny and their potential for unlimited growth.

As mentioned previously, the major ethical problem with embryonic stem cells is that the early embryo, the blastocyst, must be
destroyed in order to retrieve these cells. It is my firm conviction that this earliest embryo is human life worthy of protection. Once the nucleus from sperm and egg unite in the newly fertilized egg, a biochemical cascade begins that leads inevitably to a baby nine months later as long as the embryo is in the proper environment.

But there are other problems aside from the ethical barrier. The proper chemical signals to direct stem cells to turn into the cells you want are unknown. This is certainly the goal of research. Human embryonic stem cells have been coaxed to differentiate but since nearly all of the experimental work to

date has been done with embryonic stem cells from embryos leftover in fertility clinics there are immune rejection problems. These foreign cells are treated like they were from an organ donation.

Additionally, these cells are programmed to undergo rapid cell division. In China a man with Parkinson's was treated with human embryonic stem cells which turned into a tumor (teratoma) in his brain that killed him. The power of these cells is also a source of their peril.

In summary, embryonic stem cells possess uncertain promise. They require the death of the embryo. All therapies with any kind of stem cell are experimental and may not work. Right now, too much is being promised, and coverage in the media has been biased toward embryonic stem cells and is inaccurate.

When these difficulties and question marks are considered in the light of the exciting promise of adult stem cells, which are already producing positive results in human clinical trials, the pursuit of embryonic stem cell research is questionable at best. Just recently a major U.S. journal reported that bone marrow stem cells show great promise in treating the diseased lungs of cystic fibrosis patients.{1} CF is the most common fatal genetic disorder in the Caucasian population. Adult stem cells continue to outperform embryonic stem cells.

Stem Cells and the Last Election

The first human embryonic stem cells were isolated from embryos donated from fertility clinics in 1998. Prior to that, Congress had passed—and President Clinton had signed—legislation that prohibited the use of federal money for the destruction or use of human embryos for research purposes. This was seen as worthy even for pro-choice advocates because no one wanted to go down the road of using even the earliest human life for research purposes.

When President Bush took office in January 2001, pressure had already come from the medical research community to revise this restriction so federal grants could be used to explore this promising research avenue. Adult stem cells were still viewed as being too restricted for general research use in humans. In August 2001, President Bush issued his now famous compromise
of allowing federal funds to be used to research embryonic stem cells already isolated from human embryos, but keeping in place the restriction for using federal dollars for destroying human embryos to obtain additional cell lines.

The National Institutes of Health estimated that there were already over sixty human embryonic stem cell lines isolated around the world that would be available for research purposes. The President was criticized by pro-life advocates for allowing any federal money for research on embryonic stem cell lines, and the medical research community criticized the President for not allowing federal research money for the creation of new embryonic stem cell lines. If everybody is unhappy, it sounds like a good compromise!

The events of September 11, 2001 quickly removed this controversy from the public's attention, but the 2004 presidential election
brought it back front and center. The Bush administration, supported by the President's Council for Bioethics, continued to argue against federal money for the destruction of embryos.

The Kerry campaign seized what they saw as an opening and began claiming that they would lift the ban on stem cell research. They enlisted Ron Reagan to deliver this message at the Democratic National Convention in July, 2004. Ronald Reagan had recently passed away from Alzheimer's, and many were claiming that embryonic stem cell research could bring a cure for Alzheimer's disease.

There were several problems with this message. First,

President Bush never banned stem cell research. The Administration was funding adult stem cell research at about $190 million a year and embryonic stem cell research at about $25 million a year. Private money was always legal to use, but private investors were staying away because of the ethical problems and the
lack of progress.

Second, researchers had already testified on Capital Hill that Alzheimer's was likely not curable by treating the brain with stem cells since it was considered a whole brain disease and cell replacement would not do much good. The media just couldn't get it right.

The Distortion and the Hype of Embryonic Stem Cells

Those of us who are opposed to the use of embryonic stem cells for research are routinely accused of being hard-hearted toward those whose maladies can be addressed with stem cell research. Of course, this is not the case. We fully support adult stem cell research, but even if adult stem cells prove problematic in some cases I would still not support embryonic stem cell research when the embryo must be destroyed to obtain them.

When we think about saving lives we must count the cost. Is relieving the symptoms of disease worth the cost of the lives of the weakest and most defenseless members of society? Treating embryos with careless disregard will lead to further abuses down the road.

One of the problems with embryonic stem cells was the possibility of immune rejection. To avoid this, many want to clone the affected individual and use the embryonic stem cells from the clone. But this treats the human embryo as a thing, a clump of cells. The basis of this ethic is strictly "the end justifies the means." Even the term "therapeutic" is

problematic. The subject is destroyed.

Many try to get around the destruction of the embryo problem by claiming the blastocyst is just reproductive cells and not a person. Medical mystery writer Robin Cook gave us an example in his most recent thriller, *Seizure.*{2}. In the book a medical researcher appears before a Senate committee and says, "Blastocysts have a potential to form a viable embryo, but only if implanted in a uterus. In therapeutic cloning, they are never allowed to form embryos. . . . Embryos are not involved in therapeutic cloning."{3} Hm!

Later in the epilogue, Cook, who is an MD, says, "Senator Butler, like other opponents of stem-cell and therapeutic cloning research, suggests that the procedure requires the dismemberment of embryos. As Daniel points out to no avail, this is false. The cloned stem-cells in therapeutic cloning are harvested from the blastocyst stage well before any embryo forms. The fact is that in therapeutic cloning, an embryo is never allowed to form and nothing is ever implanted into a uterus."{4}

Cook is greatly mistaken. A 1997 embryology text states plainly that "The study of animal development has traditionally been called embryology, referring to the fact that between fertilization and birth the developing organism is known as an embryo."{5} So let's be very careful and pay attention to what is said. Some are trying to manipulate the debate by changing the "facts." We must promote the incredible success and continued promise of adult stem cells while continuing to spell out the long term peril of embryonic stem cells.

Notes

1. Wang, Guoshun, Bruce A. Bunnell, Richard G. Painter, Blesilda C. Quiniones, Nicholas A. Lanson Jr., Jeffrey L. Spees, Daniel J. Weiss, Vincent G. Valentine, Darwin J.

Prockop, “Adult stem cells from bone marrow stroma differentiate into airway epithelial cells: Potential therapy for cystic fibrosis” PNAS online, www.pnas.org (accessed December 22, 2004).

2. Robin Cook, *Seizure* (New York: Berkeley Books, 2003), 429.

3. Ibid, 32-33.

4. Ibid, 428.

5. Scott F. Gilbert, *Developmental Biology*, 5th ed. (Sunderland, Mass.: Sinauer Associates, Inc., 1997), 3. Later in the same text, Gilbert clearly equates the blastocyst and embryo when he says on page 185, “While the embryo is moving through the oviduct en route to the uterus, the blastocyst expands within the zona pellucida.” Gilbert seems to have had a change of heart between his fifth edition and the sixth. In the sixth edition of his textbook Gilbert defines embryology differently. “The study of animal development has traditionally been called embryology, from that phase of organisms that exists between fertilization and birth.” This is on page 4 of the new edition and curiously leaves the word embryo out of the definition of embryology. Perhaps Cook and Gilbert know each other!

See Also:

- The Controversy Over Stem Cell Research [2001]
- Putting the Brakes on Human Genetic Engineering
- Stem Cells and the Controversy Over Therapeutic Cloning
- Probe Answers Our E-Mail: “Your Anti-Stem Cell Research Position Disregards Diabetics“

The Case for a Creator

It has been the popular belief for decades that science and Christianity are light years apart. However, as our knowledge of cosmology, astronomy, physics, biochemistry, and DNA has continued to grow, this supposed gap has all but disappeared. Lee Strobel, award-winning journalist and former atheist, explores these and many other compelling evidences in his latest book, *The Case for a Creator*. In this article we will discuss just a handful of these evidences, as presented in his book, and find out how science itself is steadily nailing the lid on atheisms coffin.{1} Lets begin with the argument from cosmology.

Cosmology

Cosmology is the study of the origin of the universe. In investigating this field of study, Lee Strobel interviews philosopher and theologian, Dr. William Lane Craig. Craig describes in great detail what he calls “one of the most plausible arguments for God’s existence, the Kalam cosmological argument.{2} This argument has three simple steps: Whatever begins to exist has a cause. The universe began to exist. Therefore, the universe has a cause.

Craig then explains that when he first began to defend the Kalam argument he anticipated that the first step of the argument, whatever begins to exist has a cause, would be almost universally accepted. It was the second point, the universe began to exist, which he believed would be more controversial. However, so much evidence has accumulated, Craig explained, that atheists are finding it difficult to deny that the universe had a beginning. So theyve begun to attack the first premise instead.{3}

One such attack was presented in the April 2002 issue of *Discover* magazine. In an article entitled Guths Grand Guess,

the author describes how quantum theory allows for thingsa dog, a house, a planetto be materialized out of a quantum vacuum. One professor is quoted as saying, Our universe is simply one of those things which happens from time to time.{4} Could such an audacious claim be valid?

Craig debunks this claim by making two very important points. First, These subatomic particles the article talks about are called virtual particles. They are theoretical entities and its not even clear that they actually exist as opposed to being merely theoretical constructs.{5} Secondly, however, these particles, if they are real, do not come out of nothing. The quantum vacuum is not what most people envision when they think of a vacuum that is, absolutely nothing. On the contrary, its a sea of fluctuating energy. This begs the question, So where does this energy come from? It must have a cause. So even quantum theory fails to explain the origin of the universe without a Creator. Rather, as Craig explains, the first cause of the universe is the transcendent personal Creator{6} of the Bible which states that In the beginning God created the heavens and the earth.

Anthropic Principle

What is called the *anthropic principle* essentially states that all seemingly arbitrary and unrelated constants in physics have one strange thing in common these are precisely the values you need if you want to have a universe capable of producing life.{7} To explore the particulars of this, Strobel interviews Robin Collins, who has doctorates in both physics and philosophy.

Collins, who has written several books on this subject, is asked to describe one of his favorite examples. He proceeds to illustrate the fine-tuned properties of gravity. He does so by comparing the range of possible gravitational force strengths with an old-fashioned linear radio dial that spans the entire

width of the known universe. He says,

> *Imagine that you want to move the dial from where its currently set. Even if you were to move it by only one inch, the impact on life in the universe would be catastrophic. . . .*
>
> *That small adjustment of the dial would increase gravity by a billion-fold. . . .*
>
> *Animals anywhere near the size of human beings would be crushed. . . . As astrophysicist Martin Rees said, In an imaginary strong gravity world, even insects would need thick legs to support them, and no animals could get much larger. In fact, a planet with a gravitational pull of a thousand times that of the Earth would have a diameter of only forty feet, which wouldnt be enough to sustain an ecosystem. . . .*
>
> *As you can see, compared to the total range of force strengths in nature, gravity has an incomprehensibly narrow range of life to exist.{8}*

Collins goes on to discuss several other constants which show a remarkable degree of fine-tuning such as the mass difference between neutrons and protons, electromagnetic forces, strong nuclear forces, and the cosmological constant. In fact, one expert has said that there are more than thirty separate physical or cosmological parameters that require precise calibration in order to produce a life-sustaining universe.{9}

It is this amazing degree of fine-tuning within physics which Collins believes is by far the most persuasive current argument of the existence of God.{10} The deeper we dig, Collins concludes, we see that God is more subtle and more ingenious and more creative than we ever thought possible. And I think that's the way God created the universe for usto be full of surprises."{11}

Astronomy

It had been said for years that there's nothing unusual about Earth. It's an average, unassuming rock that's spinning mindlessly around an unremarkable star in a run-of-the-mill galaxya lonely speck in the great enveloping cosmic dark, as the late Carl Sagan put it.{12} However, this is no longer thought to be the case. Even secular scientists are talking about the astounding convergence of numerous unexpected "coincidences" that make intelligent life possible on Earth, and in all likelihood, nowhere else in the universe.

In exploring these recent discoveries, Lee Strobel meets with Dr. Guillermo Gonzalez and Dr. Jay Wesley Richards, coauthors of the book *The Privileged Planet*. After hashing out a long list of unique characteristics of our own galaxy, our sun, and our planet, they then began to discuss another amazing coincidence: a whole new dimension of evidence that suggests this astounding world was created, in part, so we could have the adventure of exploring it.{13}

One of the more interesting examples given is that of a solar eclipse. Perfect solar eclipses have allowed scientists to do things such as determine specific properties of stars and confirm predictions associated with Einsteins theory of relativity. Such things would be extremely difficult to explore if it werent for total eclipses. However, such eclipses are unique to Earth within our solar system. Of the nine planets and over sixty moons, only Earth provides the optimal scenario for viewing an eclipse. This is possible because our moon, which is 400 times smaller than our Sun, happens to also be exactly 400 times closer. This allows for just the right conditions for a perfect solar eclipse.

What intrigues Gonzalez is that the very time and place where perfect solar eclipses appear in our universe also corresponds to the one time and place where there are observers to see them.{14} Richards adds, What is mysterious is that the same

conditions that give us a habitable planet also make our location so wonderful for scientific measurement and discovery. So we say there's a correlation between habitability and measurability.{15}

Indeed, this is exactly what we would expect if an all-loving, all-powerful God created the universe not only to sustain man but also, and most importantly, that man could find Him through it.

Information

In 1871, Darwin suggested in a personal letter that life may have originated spontaneously in some warm little pond, with all sorts [of chemicals] present.{16} However, in his day the immense complexity of living cells was virtually unknown. Today thats not the case. Modern science has revealed that cells are extremely complex and that this complexity is governed by the information packed structures of DNA. This raises the question, Where did this information come from?

To answer this question Strobel enlists the help of Dr. Stephen Meyer, who has degrees in physics, geology, history, and philosophy. During the course of their discussion, Meyer elaborates on various explanations as to the origin of information in the first living cell. After describing the virtual impossibility of simple random chance over time producing such information, and acknowledging the fact that virtually all origin-of-life experts have utterly rejected such an approach,{17} Strobel focuses Meyer in on a more recent attempt at an explanation, that which at times has been called *biochemical predestination*.

Meyer says the idea is that the development of life was inevitable because the amino acids in proteins and the bases, or letters, in the DNA alphabet had self-ordering capacities that accounted for the origin of the information in these

molecules.{18} He then goes on to explain why this notion just isnt true.

First, he notes that the kind of self-ordering we see in nature, such as that in salt crystals, is repetitive; a particular sequence is simply repeated over and over again. It would be like handing a person an instruction book for how to build an automobile, Meyer explains, but all the book said was the-the-the-the-the. You couldnt hope to convey all the necessary information with that one-word vocabulary.{19}

Secondly, and more importantly, he points out that science has demonstrated the complete absence of any attraction between the four letters of the DNA code themselves. So theres nothing chemically that forces them into any particular sequence, Meyer states. The sequencing has to come from outside the system.{20}

For Strobel, as well as many scientists, the conclusion is compelling: An intelligent entity has quite literally spelled out evidence of His existence through the four chemical letters in the genetic code. Its almost as if the Creator autographed every cell.{21}

Consciousness

Webster defines consciousness as the quality or state of being aware especially of something within oneself.{22} According to Darwinists, the physical world is all there is. Consciousness, therefore, is nothing more than a byproduct of the properties of chemicals. As far back as 1871, evolutionists believed that the mind is a function of matter, when that matter has attained a certain degree of organization.{23} Is this really true? Is the mind simply, as MITs Marvin Minsky put it, a computer made of meat?{24} Or is the Bible correct in its assertion that men and women are comprised of both material and immaterial components?

To address this question, Strobel interviews Dr. J. P. Moreland, who has degrees in chemistry and theology, and a Ph.D. in philosophy. One of the most compelling arguments presented by Moreland during this interview was the positive experimental evidence that consciousness and the self are more than simply a physical byproduct of the brain. For example, Moreland said, neurosurgeon Wilder Penfield electrically stimulated the brains of epilepsy patients and found he could cause them to move their arms or legs, turn their heads or eyes, talk, or swallow. Invariably the patient would respond by saying, I didn't do that. You did. According to Penfield, the patient thinks of himself as having an existence separate from his body. No matter how much Penfield probed the cerebral cortex, he said, There is no place . . . where electrical stimulation will cause a patient to [think]. Thats because [thought] originates in the conscious self, not the brain.{25}

As Strobel notes in agreement, it is evidence like this which has led one pair of scientists to conclude that physics, neuroscience, and humanistic psychology all converge on the same principle: mind is not reducible to matter. . . . The vain expectation that matter might someday account for mind . . . is like the alchemist's dream of producing gold from lead.{26}

Conclusion

It is evidences like these, as well as the many others presented by Lee Strobel, which has continued to persuade scientists in every field of study that there must be a Designer. Naturalistic explanations are not sufficient to explain the beauty, complexity, and design that we observe both around us and within us. Strobel, indeed, presents an amazingly strong case for a Creator.

Notes

1. Lee Strobel, *The Case for a Creator* (Grand Rapids, Mich.:

Zondervan, 2004) jacket.
2. Ibid., 97.
3. Ibid., 98.
4. Brad Lemley, “Guth’s Grand Guess,” *Discover* (April 2002) p. 35.
5. Strobel, 101.
6. Ibid., 110.
7. Ibid., 126.
8. Ibid., 132.
9. Ibid., 132.
10. Ibid., 130.
11. Ibid., 150.
12., Ibid., 153.
13. Ibid., 185.
14. Ibid., 186.
15. Ibid., 186.
16. Francis Darwin, *The Life and Letters of Charles Darwin* (New York: D. Appleton, 1887), 202.
17. Strobel, 229.
18. Ibid., 232.
19. Ibid., 234.
20. Ibid., 235.
21. Ibid., 244.
22. Merriam-Webster’s Collegiate Dictionary, 10th ed., s.v., “Consciousness.”
23. Thomas Huxley, “Mr. Darwin’s Critics,” *Contemporary Review* (November 1871)
24. Strobel, 250.
25. Ibid., 258.
26. Ibid., 272.