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Heather graduated magna cum laude from the University of Texas at Dallas with a B.S. in chemistry and a minor in government and politics. She received her M.S. in chemistry, also from UTD; her research was in organic synthesis and materials. She interned at Probe Ministries prior to graduate school and now serves with Probe as a Research Associate. Her interests involve science and culture issues, including bioethics, origins, and the environment. She is currently working on a M.A. in bioethics from Trinity International University. She is married to David, another former Probe intern and teacher at Trinity Christian Academy. You can find Heather's updates on her web site: www.hz-probe.ministryhome.org.

PROBE PUBLICATIONS

Amniotic Stem Cells
Healthcare and the Common Good
Human Embryonic Stem Cells Go to Human Trials
A Meaningful World
Michael Moore's Sicko Healthcare Perspective
The Mitchell Report: Christian Response to Steroids in Sports
Personhood and Origins
The Spiritual Brain
The Texas State Board of Education and Public School Content (David Zeiger as co-author)

PUBLICATIONS

"Amnionic Stem Cells." The Conservative Voice (www.theconservativevoice.com – now townhall.com), January 10, 2007
"Can ID Contribute to Our Understanding of Genetics?" by Raymond G. Bohlin and Heather Zeiger *Salvo*, Issue 4 Winter 2008.
Book Review: "A Meaningful World," *Areopagus Journal*, vol. 7, no. 6, November-December 2007.

LECTURES

A Christian View of the Mind and Brain
Evidence for the Existence of God
Genetic Engineering
Origins
Personhood
Stem Cells
Teaching Bioethics in the Church
Worldviews

The Texas State Board of Education and Public School Content

The Facts

The Texas State Board of Education is a group of fifteen individuals, representing various districts in Texas. One of their roles is to decide on standardized, statewide guidelines

on public school contents for grades K-12. These guidelines are delineated in the Texas Essential Knowledge and Skills (TEKS), which dictate the content for every subject for every grade level that students must master in order to graduate from a Texas accredited public school. Importantly, these guidelines also dictate what textbooks are approved for classrooms and selection criteria for universities. While these guidelines are not enforceable in the private school setting, private schools that are college preparatory must consider these guidelines in determining student advancement and subsequent collegiate eligibility.

The old draft of the TEKS, which was approved in 1998, states that students are expected to "analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information."{1}

The new draft of the TEKS, set for final approval in March 2009, states in the parallel section that students are expected to "analyze and evaluate scientific explanations using empirical evidence, logical reasoning, and experimental and observational testing."{2} This line is in the introduction to the Biology class content under "scientific processes." The content portion of the biology class has various topics listed, and what students are required to master within each of these topics. Topics include *Cells and Cellular Processes*, *Molecular Genetics and Heredity*, *Evolution and Populations*, *Classification and Taxonomy*, *Biochemistry*, *Systems and Homeostasis*, *Ecosystems*, and *Plants*. Under each of these topics are specific items that students need to know.

The Contentious Issues

Those are the facts of the issue as best as we can describe them. However, these changes have created more than a little uproar from various groups that have a vested interest in how evolution is taught. The lines divided as such: advocates of

the unquestioned teaching of evolution in public schools who were in favor of the new wording, and advocates of questioning certain aspects of evolutionary theory who were in favor of keeping the wording “strengths and weaknesses” within the TEKS. Many people that were for the new wording said that there were no weaknesses to evolutionary theory, or accused the other side of using this language of “weaknesses” to somehow smuggle creationism into the classroom. Many people who wanted to keep the strengths and weakness language intact accused the other side of censorship and subversively teaching an ideology and abridging academic freedom.

The Texas State Board of Education hosted a public hearing on Wednesday, January 21 (2009), where they welcomed testimony from individuals. The hearing would close at 12:40 p.m., no matter how many testifiers were left on the schedule. With a list of nearly a hundred, the Board only got through thirty testifiers. Some provision was made for trading up and testifying earlier, and the Board members invited select individuals to testify at the public hearing. However the majority of people there to be heard, including me (spot thirty-nine), and my husband (a science teacher who has taught both in public high school and private middle school and was spot sixty-three) went unheard. While each testifier had a three-minute time limit, an obviously divided Board asked several questions, either for clarification or to be on public record for having asked.

Whatever one may read or hear in the media, most of the testimonies on both sides were articulate and intelligent, and the testifiers fielded their questions remarkably well. If you look at the audience, you might think it looked like a rally; the room was a bit of a zoo. But the testimonies were certainly at a higher level than some kind of emotionally-charged, rah-rah pep rally. Whether we agreed with them or not, we thought each testifier made good points.

Testimonies

While we do not necessarily agree with everything below, we have summarized the main points presented by each side.

For the Proposed Wording and Against "Strengths and Weaknesses" Wording

- *The old wording does not provide guidance to teachers, especially new teachers.*
- *Students are not necessarily capable of analyzing evolutionary theory, or are not necessarily capable of evaluating the current research.*
- *Academic freedom refers to the university level, and students do not have the same freedoms of speech as adults.*
- *The current draft has more specific wording.*
- *There is a possibility of litigation as has happened in other states.*
- *Students could fall behind if they are taught supposed weaknesses in evolutionary biology.*
- *"Strengths and Weaknesses" wording would block the publication and adoption of good textbooks. In fact, it could result in the adoption of subversive Creationist books designed to exploit this flaw in educational guidelines.*
- *These weaknesses are pseudoscience, or these weaknesses are from sources that engage ifn pseudoscience (no satisfactory definition of pseudoscience was given).*
- *The word "weaknesses" has changed in meaning due to the use of it for P.R. by certain Creationist groups, and therefore should not be included in the TEKS.*
- *Warning that people may doubt the integrity of Texas education if strengths and weaknesses are allowed.*
- *"Strengths and weaknesses" is inaccurate because there are*

no weaknesses. These supposed weaknesses are false and misleading information. Teaching weaknesses is likened to teaching that Grant surrendered to Lee.

• It's better to get your information from the National Academy of Sciences than from "creationist" sources [quotes are mine].

• The peer review literature does not argue whether evolution happened, it is just researching how it happened. Whether it happened is not in question.

Against Proposed Wording and For "Strengths and Weaknesses" Wording:

• Even within the "strengths and weaknesses" wording, there has been silencing of students, and some teachers are intimidated to even broach the subject. Examples were cited by two of the testifiers.

• Cases of scientific hoaxes were cited by several people, including Piltdown Man and Haeckel's Embryos. These are significant because many evolutionists will not admit these were hoaxes/errors. While they could be examples of how theories grow and change (something they agree is part of science and should apply to evolution), they instead go unaddressed and worry those who respect true scientific research and achievement.

• No one area of science has answers to everything, so there are always weaknesses in theories.

• There has been no litigation in the last twenty years with the wording "strengths and weaknesses" and to say that this encourages pseudoscience, brings up the question as to whether Texas has been engaging in pseudoscience for the last twenty years.

• Standards should promote academic diversity and critical

thinking. Some of the great minds in science were non-conformists.

• Children begin thinking abstractly at young adolescence, and their abstract and cognitive abilities continue to develop through high school. This stresses the importance of including critical thinking skills in the TEKS. Teaching strengths and not weaknesses does not promote abstract thinking.

• Teaching strengths and weaknesses is more honest.

• Examples were cited of students who did learn strengths and weaknesses and it worked well.

• Real science deals with strengths and weaknesses of a theory; why should evolution be held to a different standard?

• We should not proclaim high school students too dumb to understand (my note: two of the testimonies were given by high school seniors).

• "Evolution" is a tricky term because when someone says "evolution" they may mean three different things, one of which is a fact and two of which are conjecture: 1) Microevolution (fact), 2) Common Descent (theory), 3) Natural Selection acting on mutations is how things evolve (theory). Student should distinguish this.

• Scientific consensus is only one part of science, the conclusion part. Students need to also know the scientific process.

• There is a difference between scientific law, theory and hypothesis.

• All theories are refined in the scientific process. Evolution does not have testable postulates. (This testimony was cut off due to time, but he was going to distinguish between origins and operations science).

Assessment

My husband David is a science teacher who has taught high school science in public school and now teaches middle school science in a private, college-preparatory school. I have two degrees in science and am a research associate at Probe Ministries. Here is our assessment of the TEKS:

The wording "strengths and weaknesses" seems very intentionally omitted from the proposed version, which is suspect, but neither one of us can say definitively that it was left out in order to promote a particular agenda of misleading students or indoctrinating them by evolutionist advocates. "Analyze and evaluate" does convey something different than "analyze, review, and critique" and it does seem to be a very subtle difference that allows for slightly less freedom of discussion within the classroom; however, with this language, by itself, there may still be opportunity to have a rigorous discussion of weaknesses, especially if it falls under the category of "evaluating." Its omission from the TEKS however, as one Board member pointed out, does communicate something as well, so we are skeptical of the perceived freedom with this language.

Another, and what I think is a blatant problem with the evolution curriculum, is in the specific wording within the evolution content section. Within the TEKS Biology section, there are several topics that the students must cover. Within each of those topics are specific things that they must master. In the TEKS proposed draft, the evolution section of high school biology requires students to:

> *A. Identify how evidence for common ancestry among groups is provided by the fossil record, biogeography, and homologies including anatomical, molecular, and developmental;*
>
> *B. Recognize that natural selection produces change in populations, not individuals;*

C. Describe the elements of natural selection including inherited variation, the potential of a population to produce more offspring that can survive, and a finite supply of environmental resources resulting in differential reproductive success;

D. Recognize the relationship of natural selection to adaptation, and to the development of diversity in and among species; and

E. Recognize the effects of other evolutionary mechanisms including genetic drift, gene flow, mutation, and recombination.[{3}]

The action verb at the beginning of each of these points is important because each verb is intentionally chosen, and from an educator's perspective has a technical meaning. According to Bloom's taxonomy of educational activities, verbs such as "describe," "define," or "identify" represent a low level of cognizance, while words such as "explain," "recognize," "illustrate" and "predict" are mid-level, and words such as "compare" "analyze," "interpret" are higher level of cognizance.[{4}] In *all* of the other science concepts taught in biology, students are asked to "compare," "investigate," "predict," "analyze," and "interpret." However, evolution is kept at a purely definitional level, meaning that even though the proposed TEKS include "analyze and evaluate" within the general scientific process section, there is no opportunity to do this when the students get to the evolution section; they are only required to essentially memorize definitions or memorize what fossils lead to common descent. Many testifiers claimed that students were free and in fact encouraged to discuss evolutionary theory. They said the "strengths and weaknesses" language was being replaced by the better, more specific "analyze and evaluate." This is intentionally misleading. The general standards do read that way, but the evolution section itself is exempt from this rigid treatment

in the new TEKS.

I was particularly unimpressed with Terrence Stutz's article from the *Dallas Morning News*, in which he labeled the board members who wanted to include "weaknesses" as being aligned with "social conservative groups that in past have worked to cast doubt on science-based theories on the origins of life,"{5} when really, most of the testifiers and Board members that wanted "weaknesses" left in the TEKS, including my husband and myself, are arguing for academic freedom and free inquiry. The way evolution is handled in the proposal does nothing to promote even an analysis and evaluation, let alone an atmosphere of inquiry on a theory that is supposed to be the cornerstone of biology. {6}

The Vote and Results:

The Texas State Board of Education had a preliminary vote Thursday, and it was tied 7-7, which means that, so far, "strengths and weaknesses" language will not be in the next version of the TEKS (it requires a majority). However, the board has until March to make its final decision, and make a final vote.

While "strengths and weaknesses" is not in the current draft of the TEKS, the board did vote on some amendments that ask students to "analyze and evaluate" specific aspects of evolutionary theory, bringing the evolution science concepts up a notch (or two) on Bloom's scale.

According to *Evolution News and Views*,{7} the wording change is as follows:

> *(7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to:*
>
> *(A) analyze and evaluate how evidence of common ancestry among groups is provided by the fossil record,*

biogeography, and homologies including anatomical, molecular, and developmental;

(B) analyze and evaluate how natural selection produces change in populations, not individuals;

(C) analyze and evaluate how the elements of natural selection including inherited variation, the potential of a population to produce more offspring than can survive, and a finite supply of environmental resources result in differential reproductive success;

(D) analyze and evaluate the relationship of natural selection to adaptation, and to the development of diversity in and among species; and

(E) analyze and evaluate the effects of other evolutionary mechanisms including genetic drift, gene flow, mutation, and recombination.

Furthermore, the Board passed an amendment that asks students to "Analyze and evaluate the sufficiency or insufficiency of common ancestry to explain the sudden appearance, stasis, and sequential nature of groups in the fossil record."{8} Unfortunately, media coverage on these particular amendments are scarce. We would consider these amendments a success, especially since they address the issue of low-level cognizance in the evolution requirements. Now they are at a level that seems much more appropriate for high school biology, and we feel will promote good critical thinking and intellectual inquiry. We also believe that these amendments will better serve to prepare our students for the intellectual rigor and higher level thinking skills that they will need at the collegiate level.

Public Testimony

Heather Zeiger, M.S.
Research Associate, Probe Ministries

I went to Texas public schools for junior high and high school. I knew then that I was going to pursue a career in science, and ended up choosing chemistry my senior year. I graduated in 1999, and at the time, I had received some education in evolutionary biology. That education mostly consisted of memorizing facts and definitions, but gave no indication that there was anything more to be discussed. By way of example, one of the things we learned in biology was the Miller Urey experiment. We learned that this was the prevailing theory on how life began, and this is how it worked. There was no further discussion on chemical origins, and as far as I knew from what I was taught in the public high school, scientists agreed that this was how it happened. Except . . . it turns out that there were and still are many questions about chemical origins. In fact, as I later learned, there is an entire field of study in which chemists deal with the very fundamental questions of how life began. There is more than a little contention among those who believe that life came from an RNA-based world and others who believe that it was originally metabolic. There are still others who think that life beginning from purely chemical processes may not even be possible under our current theories.

What was presented as a boring little tidbit in our biology books, actually is an entire field of inquiry. Chemical origins is just one area of evolutionary theory; and as we all know there are evolutionary biologists still researching these issues, which means that there are still challenges or unexplained parts of the theory to be investigated. The students that go into science, the ones I've worked with, are fascinated by the unexplained parts of a theory, by the mysteries. I think is a disservice to our children and to the scientific community to gloss over the places where a theory

needs more work. We should encourage students to go on and become the next scientist to answer these questions in evolutionary theory. While the proposed draft does discuss strengths and limitations, in science, in general, it does not leave the evolution section open to this, but keeps it at a definitional level. I therefore contend that the Biology TEKS, science concept seven (evolution) should be phrased in such a way that would go beyond the less interesting part of science, identification and description of terms. And hopefully, this will open classroom instruction to analysis and discussion of current strengths and weakness within this important theory.

Texas State Board of Education
Public Testimony
David Zeiger
Texas SBEC Certified Science Composite Teacher for Grade 9-12

My name is David Zeiger and I am a certified composite science teacher for grades nine through twelve. I taught Chemistry and Physics for two years in Garland ISD, and now I teach seventh grade Life Science at Trinity Christian Academy, a private college preparatory school in Addison. In my relatively brief tenure as a science teacher, I have had to come to terms with a simple discouraging fact: most of my students will not love science as much as I do, let alone become researchers, engineers, doctors, nurses, or even science teachers. In fact the National Science Foundation found that in 2000 only one third of college students earn bachelor degrees in science and engineering.{9}

Therefore, when I read the TEKS as the guiding structure for my curriculum, I have to ask what my job as a science teacher truly is. Am I wasting my time with two-thirds of my students? Memorizing the parts of a plant, reeling off the periodic table, or calculating using laws of motion; are these things that students are going to use again? Do I even want them to memorize a chart with the strengths and weaknesses of evolutionary theory? No. The things that every student can

take with them are how to gain information from their environment, whether that environment is a job training manual, a relationship with their spouse, or a new technique for hammering a nail; how to test that new information against their previous experience and training; and most importantly, how to be flexible enough to change their ideas when it turns out they were wrong.

Those important methods of learning are included in the TEKS for non-biology science classes and in the non-evolution biology standards. When teaching science other than the evolutionary theory, students are asked to "compare," "predict," "investigate," "explore," "explain," "analyze," "interpret," and "model," activities from the whole range of cognizance. But, the proposed recommendations on evolution use language that refer to and limit the students to the simplest level of cognitive learning: memorization.

If we don't teach the simple fact that every theory has weaknesses, we don't teach young people true science. If we don't teach them to find and evaluate those weaknesses, we don't teach them to be humble in their search for truth. And if we don't teach them how to keep or reject those theories, we leave them as prey to whoever has a stronger opinion than they do.

Please keep teaching students to analyze and evaluate scientific theories. Critical reasoning is one of the few things I know all my students will need and use every day of their lives.

Notes

1. 1998 TEKS, Section 112.43, (c), (3), (A).
2. Section 112.43 (c), (3), (A) of proposed TEKS
3. Proposed 2009 TEKS Section 112.43, (7)
4. www.teachervision.com
5. Terence Stutz, "Texas Board of Education votes against

teaching evolution weaknesses," *Dallas Morning News*, January 24, 2009. tinyurl.com/bncw55
6. Theodosius Dobzhansky, "Nothing in biology makes sense except in the light of evolution," *American Biology Teacher* 1973, volume 35, pp. 125-129.
7. www.evolutionnews.org/2009/01/recap_texas_board_of_education.html
8. Ibid.
9. www.nsf.gov/statistics/seind04/c2/c2s3.htm

Human Embryonic Stem Cells Go to Human Trials

January 23, 2009

Just when we all thought that perhaps the wind in the sails of the human embryonic stem cell debate had abated, Geron Inc. announced that it was approved by the FDA to conduct an experimental procedure on human subjects who have suffered from a recent spinal cord injury. The procedure would involve the injection of neural cells derived from human embryonic stem cells into a spinal cord injury site. The patients would receive two months of immune suppressant drugs and will be closely monitored for a year. The stem cells were obtained from some of the oldest lines of human embryonic stem cells that were left over from in vitro fertilization procedures.

What if this doesn't work?

There are many human embryonic stem cell researchers who are worried about Geron doing the first human trials. Dr. Kessler, chairman of neurology and director of the stem cell institute

at Northwestern University, is quoted in the *New York Times* as being skeptical that Geron's technique will work on human patients. In trials with mice, Geron showed that mobility increased in the tails and legs of mice with moderate spinal cord damage. Also, the mice showed no formation of tumors, a problem with embryonic stem cell therapies. However, the mice had "moderate injuries," and Kessler is skeptical that alleviating moderate injuries in mice will translate in the severe injuries in humans.

For those of us who are against the use of embryos for research purposes, this would be another example of the difficulty of using embryonic stem cells. This is just one more reason why more research and research dollars should be focused on adult stem cells. Adult stem cell research has been successfully used in humans for years, and is not ethically contentious.

As Christians, we also need to be mindful and prayerful of the fact that there are many people who have placed hope in embryonic stem cell research. The media has portrayed embryonic stem cells as the panacea for everything from spinal cord injuries to diabetes to Alzheimer's. We need to be sensitive to the pain and disappointment that this could be for many people who have had to deal with permanent injuries or debilitating conditions.

What if this works?

First of all, even if this particular trial works, the scientists at Geron say that there is still many years of work to do. All they are testing now in Phase I clinical trials is if it is safe. Testing for efficacy comes later.

If this procedure works both safely and therapeutically, then we as Christians have the most difficult position. The fact that we believe the embryo is a person, and that it has value and dignity, does not change. Also, the fact that from a

biblical perspective it is unethical for us to decide to destroy one life to save another, and to value one life over another, does not change. But anyone who is in this position or has a child, a spouse, or a loved one paralyzed due to a spinal cord injury must make a decision, and no matter what decision they make there will likely be feelings of guilt, regret and temptations too. Consider two examples:

> *1) Your spouse is in a horrible car accident and suffers from a spinal cord injury which will likely leave him/her paralyzed. You have the option of doing embryonic stem cell therapy at the injured site, which may result in your spouse regaining some mobility. You don't think it is right to destroy an embryo because it is a person too, and is made in the image of God so it has inherent value. As you watch your spouse work with his/her injury, learning how to live life without mobility, how likely is it that you will ask yourself, "Did I do the right thing?" "If that embryo was going to die or be used in someone else anyway, why not my spouse?" How tempting would it be to carry that regret and guilt?*
>
> *2) As before, your spouse is in a horrible car accident and suffers from the same injuries. This time you elect to do the embryonic stem cell therapy. Your spouse regains some mobility, but how tempting would it be to wonder about the sacrifice that was made, and the guilt associated with compromising, or to look at your children knowing that they were embryos once too?*

These are not easy decisions. I will not pretend that even though as Christians we believe in the sanctity of human life, somehow it makes one decision any easier or the other decision any less tempting. Thankfully, we do not have to make these decisions at this time, and my prayer is that I hope we never do. It is said that a society can be judged by how they treat their most vulnerable. From the biblical perspective Jesus

said, “Truly, I say to you, as you did it to one of the least of these my brothers, you did to me” (Matthew 25:40).

To give you two additional pieces of encouragement:

1) Adult stem cells have alleviated the effects of particular types of spinal cord injury in human patients (see www.discovery.org/a/2362 for a great article that was written in 2004, but seems quite timely now).

2) Desiring to alleviate the effects of the fall, including things like spinal cord injuries, is understandable. Whether or not we find a cure within someone’s lifetime, we have hope in God’s promise that he has conquered death and we will receive a resurrected body (1 Corinthians 15).

For more information on stem cells see these two articles from Probe.org:

www.probe.org/amniotic-stem-cells/

www.probe.org/the-continuing-controversy-over-stem-cells

Personhood and Origins

Does One’s View of Origins Really Matter?

In the midst of carpools, meetings, appointments, and everything else that life throws at us, does it really matter whether someone is a Darwinist or a Creationist, or holds some position in between?

Whether we are aware of it or not, we all filter our life experiences through the lens of our worldview. Nancy Pearcey, author of *Total Truth*, describes a worldview as the "mental map that tells us how to navigate the world effectively."{1}

As technology advances, we find ourselves wading through very murky waters that deal with questions of personhood at the edges of life. Questions about embryos and human experimentation and euthanasia and physician-assisted suicide are no longer speculative theories for ethicists to ponder in their ivory towers, but something that ordinary people have to deal with either through voting or through very personal decisions. And it can be confusing—which is precisely why we need a map to guide us!

Consider this: The state of Washington recently passed a law approving physician-assisted suicide. Many are lobbying congress to vote on lifting restrictions on funding for embryonic stem cell research. Great Britain is voting on funding for research on human/animal hybrids. And many of us will have to make difficult decisions about a loved one in the hospital. Just last week, a British couple used in vitro fertilization to select from a group of their own embryos one who did not have the genetic markers for breast and cervical cancer which ran in the family, leaving the other embryos to be destroyed. One's view of origins, and particularly who man is within that view, has a profound impact on how we make decisions regarding such bioethical issues.

Characteristics of the Map

Pearcey says that every worldview, or mental map, has to answer these three questions: 1) How did we get here? 2) What happened to us? and, 3) How do we make things right? *Christian theism* answers these questions with the biblical record of:

1) Creation,
2) Fall of mankind from favor and fellowship with God,

> *3) Redemption of fallen mankind through salvation in Jesus Christ.*

Naturalism would answer these questions with:

> *1) Macro-evolution, natural selection randomly acting on chance variations, (no one to answer to)*
> *2) No right or wrong, just "survival of the fittest," (no inherent law to be held to), and the*
> *3) Evolving and passing on of our DNA (no over arching plan or ultimate meaning to life than to just continue living).*

The answers to these questions directly affect our view of personhood. Both secularists and Christians would agree that "a person" is valued as having a right to life and in the United States; we would agree with our founding Fathers that they have certain inalienable rights. But the answer to the question "What is a person and how should they be treated?" is very different under each worldview, and will guide you to very different waters.

The Christian Theism Map

From the Christian view of origins, we find that man is created in the image of God{2} and that he is a special part of creation, above all other creatures.{3} Part of being made in the image of God is that humans are more than the sum of their physical parts. People are made up of both body and mind (or soul), and these physical and spiritual components are integral to a person's identity.{4} James 2:26 says that the body apart from the spirit is dead. The story of Jesus raising Jairus' daughter in Luke 8:55 makes clear that when her spirit returned to her body, she was once again alive. Also passages about the resurrection, such as 1 Corinthians 15, make a distinction between the spirit and the body.

If people are both spiritual and physical, then their value is

not just placed in physical abilities or in their genetics. There is value beyond the body. We would still consider a disabled person, or a person in a coma, or a victim of a horrible accident as a valuable person. Even if their body became functionless or mangled, they would still be valued as a person because their value and identity entails more than the physical self. The body is important and a crucial part of their identity, but it is not the only measure.

The Naturalism Map {5}

From the naturalistic view of origins, popularly embodied in Darwinism, man is part of a long heritage that began with natural selection acting first on chemicals, then cells, then simple animals, and now on the current assortment of animals, including *homo sapian*. Man is considered another animal, and does not necessarily deserve any more rights or privileges than any other animal. Because the naturalistic worldview denies the supernatural or spiritual, man is seen as merely a physical being. Therefore, his value stems entirely from in his physical capabilities and genetics.

This mental map has led to such murky waters as the *eugenics movement*, through which scientists engaged in sterilization of prisoners, the intellectually weak and the poor because they wanted to improve the human race and purge "bad genes" from the gene pool. They also considered certain races as more advanced, or more evolved, than other races. The logical end of the *eugenics movement* was realized in Nazi Germany. Darwinism is not necessarily the cause of eugenics, but eugenics is an unsurprising logical possiblility under that particular worldview.

From the naturalistic view of personhood, one man can value another man based solely on his physical appearance or capabilities. Logically, from the naturalistic worldview, one can justify almost any action because "survival of the fittest" is the reigning ethic.

The eugenics movement is widely considered a black mark on American history, and many would consider it long gone with our lessons learned. However, many bioethicists, doctors and medical health professionals still practice medicine and make decisions based on a worldview and values that were used to justify eugenics. It is common to discuss a person's "quality of life" and make decisions on how to treat—or even if they should treat a patient—based on this measure. "Quality of life" criteria are often arbitrary measures of a person's worth based on how well they function physically and mentally compared to what is deemed "normal." Unfortunately, such subjective "quality of life" ratings and scales likely reflect what the doctors or authors' personally value more than the dignity or sanctity of the individual they are measuring. Quality of life measurements and our example of the Great Britain couple choosing an embryo based on its genetic markers are examples of people practicing a type of eugenics, whether they wish to call it that or not.

So Origins Does Matter. . .

These are two very different views of man, and lead to widely varying conclusions about personhood or the sanctity of human life.

The Bible may not contain the words "stem cells" or "euthanasia" but it does speak to the value and sanctity of human life. It also addresses how we should value one another and why it is so tempting to judge each other based on our own standards instead of God's standards. Whether we are talking about the Pharisee who was thankful he was not like the tax collector or the person who decides that embryos and the elderly should not continue living because they're worth more dead than alive, one person is placing a value on another person based on his own criteria of values as opposed to God's. In fact, he is putting himself in the place of God.

I am reminded of a passage when God was directing Samuel to

anoint a new king. Samuel was judging the sons of Jesse based on physical standards only, "But the Lord said to Samuel, 'Do not look on his appearance or on the height of his stature, because I have rejected him. For the Lord sees not as man sees: man looks on the outward appearance, but the Lord looks on the heart.'"{6} Samuel judged Jesse's sons based on their physical features, but God reminds him that he has standards that are beyond what man can see. The naturalistic worldview of personhood is similar to Samuel's standards of who would be a fitting king, but the Christian theistic worldview holds that it is God's standards, not man's, that dictate how we are to value a person. God values individuals despite their physical features and while we may not see their value right away (David was a young shepherd), God does. Thus, we must trust that what he values is what we should value.

Again, our worldview is like a mental map. Personally, if I had to navigate murky waters, I would rather have a map made by the Creator, himself—a God's—eye—view of the waters—than the limited perspective of someone standing right there in the middle of it. Whose map are you going to use?

Notes

1. Pearcey, Nancy, *Total Truth*, Crossway Books, 2005, p. 23. See Probe's review of *Total Truth* here: www.probe.org/total-truth.
2. "So God created man in his own image, in the image of God he created him; male and female he created them." Genesis 1:27 (ESV Bible).
3. "And let them have dominion over the fish of the sea and over the birds of the heavens and over the livestock and over all the earth and over every creeping thing that creeps on the earth." Genesis 1:26 (ESV); See also Genesis 1:28-30.
4. See Probe's article on The Spiritual Brain: www.probe.org/the-spiritual-brain.
5. For more information on Darwinism, see Probe's articles at: www.probe.org/category/faith-and-science/origins/.

6. 1 Samuel 16:7 (ESV Bible).

Healthcare and the Common Good

One of the hot topics in the presidential election campaign is healthcare and healthcare reform, but is there a Christian perspective on healthcare? If so, what is it? I had the privilege of attending the annual bioethics conference hosted by the Center for Bioethics and Human Dignity and Trinity International University this past July. Guided by this year's theme, "Healthcare and the Common Good," some of the health profession's leading practitioners discussed issues of healthcare and the health profession from a Christian perspective.

What Is "The Common Good"?

Dr. Edmund Pellegrino, chairman of the President's Council on Bioethics, began the conference by distinguishing between first-order healthcare questions and second-order healthcare questions. First-order questions in this case involve the moral or ethical implications of healthcare. These questions include: What do we do with the poor and ill? What are our moral obligations to them? By what criteria do we judge healthcare programs? And, is the healthcare system providing for basic human needs? Second-order questions, often covered by the media, include economic issues, systems, and politics. Usually, this level of inquiry seeks to answer questions like "How is healthcare to be structured?"

Dr. Pellegrino used Aristotelian philosophy to discuss the idea of common good. He describes common good as everyone being enabled to fully achieve their own perfection as men. Essentially, everyone is valuable because he is a human being, and part of giving them value is to provide for them relief from suffering and the opportunity to flourish, whether they merit it or not. Dr. Pellegrino asserts that this is similar to the biblical idea of being not only your brother's keeper, and your enemy's keeper, but also ministering physically to those who are irresponsible. As Christians we have an obligation to care for the weak and the infirmed, and we, furthermore, cannot make value judgments on the worth of someone's life because of their personal behavior.

Human Dignity

Underlying any area of bioethics based on a Christian worldview is the concept of man as a special part of creation made in God's image.{1} This means that our views on healthcare should reflect the inherent dignity of the individual. Dr. Pellegrino discussed this essential element that part of common good is valuing man because he is man, and I would add that it is expressly because he is made in the image of God.

Many of the sessions at the conference, whether they were on doctor/patient relationships or public policy, centered on this point that man is made in the image of God and that individuals should be valued as unique and important. This presupposes a theistic worldview.

During my paper session at this conference, I emphasized the importance of a worldview approach for laying the foundation of how to evaluate specific bioethical issues. This is also essential in evaluating healthcare policies and our moral obligation to the weak and infirmed. How does one's worldview affect their various views on healthcare?

As Nancy Pearcey points out in *Total Truth*,{2} every worldview answers three basic questions: Where did we come from? What happened to us (why is there evil)? And, how can things be made right? As Christian theists we would answer these questions with "Creation-Fall-Redemption." Naturalists, on the other hand, would answer with the triad "Darwinism–Evil is an illusion–Survival of the fittest." A naturalist's creation story is that of Darwinism.{3} Therefore, man is nothing more than a product of natural selection. He does not hold a unique position above other animals, and he was not specifically created with a purpose.

One's view on origins is fundamental to how man is regarded, and it determines which ethical system is used to determine right and wrong views on healthcare. The tension is between the theistic view that man has inherent dignity and worth, despite his capabilities or lack thereof, and the naturalistic view that man's worth is based on whether or not he is a burden on society as a whole.

One view places an absolute value on a person while the other places a relative value. This, in turn, determines whether or not we share a moral obligation to help the weak and infirmed.

But We Vote on Second-order Questions!

While the ethical implications on healthcare are of primary importance, usually we are asked to evaluate healthcare based on second-order questions: How much does healthcare cost? Who should get subsidized? How are they subsidized? Should healthcare and health insurance be privatized? Which candidate's plan do I agree with?

Several of the speakers at this bioethics conference addressed specific plans by candidates and their opinions about them (For more information on second-order analyses, see the *Women of Faith Blog post* which summarizes Dean Clancy's discussion on McCain/Obama Healthcare plans. See also James Capretta's

discussion on policy analysis, PowerPoint® presentation from the conference and a related article.) But the emphasis at the conference was not in endorsing one candidate over another as much as evaluating healthcare from the perspective of a Christian worldview. In other words, we first must answer the primary questions and then use that analysis to guide our views on the secondary questions in healthcare.

I came away from the conference with an understanding that there are several problems with the current healthcare system, from overuse of technology to doctor/patient relationships to how the government subsidy system works. However, these problems are really the fruits of a deeper problem having to do the worldview approach that medical health professionals, politicians, and we, as a culture, take on the issue of health and healthcare. Healthcare is becoming more and more a consumer business or a commodity, and less and less a moral obligation to help those that are weak and infirmed (or a moral obligation to help prevent people from becoming weak and infirmed).

There is no one solution; thus, no one candidate has *the* solution to all of our healthcare problems. And deciding between expanding government subsidies and privatization is not the root of the problem, so it is not the ultimate solution. As Dean Clancy, former member of the President's Council on Bioethics, pointed out in his session on "Solutions," society can achieve four levels of "happiness": 1) the ultimate good, 2) good beyond oneself, 3) personal achievement, and 4) immediate gratification.

As a culture we are stuck at levels 3 and 4 (personal achievement and gratification), and this means our priorities and decisions are stuck there. This is directly tied to our worldview. From a naturalistic vantage point, it would be logically inconsistent to move beyond levels 3 and 4. However, on a theistic worldview, 1 and 2 follow from the biblical perspective on priorities such as, "You shall love the Lord

your God with all your heart and with all your soul and with all your mind…You shall love your neighbor as yourself."{4} God is the ultimate good, and then we are to love others by doing good beyond what benefits ourselves.

What Can I Do?

We can serve a witness to our culture by modeling the biblical perspective on healthcare and human dignity. Maybe not necessarily on the voting ballot, but oftentimes this mindset is modeled on a very personal level by providing for the weak and infirmed in our churches and communities. Or by treating individuals with value, even if they are irresponsible with their health. Or through the way doctors and nurses treat their patients. These are all very tangible ways that people can see the love of Christ and may very well be one way to change some of the problems in our healthcare system from the grassroots level.

Notes

1. "So God created man in his own image, in the image of God he created him; male and female he created them" Genesis 1:27 (ESV).
2. Pearcey, Nancy, *Total Truth: Liberating Christianity from Its Cultural Captivity*, Crossway Books, 2004, pgs. 45-46.
3. This is referring to Darwinism as a philosophy: The presupposition that there is no God, only nature.
4. Matt 22:37, 39 (ESV).

The Spiritual Brain

Heather Zeiger keys off The Spiritual Brain *by Beauregard and O'Leary to critique the materialist position that belief in God is simply in the neurons of the material brain. The Christian worldview is non-materialist and recent experiments bear out its power of explanation over and against the materialist worldview.*

The Worldview of Neuroscience

The popular worldview held in neuroscience, or the study of the brain, is materialism. Materialism says that humans are only physical beings, which means there is no possibility of an immaterial mind or a soul. On the other hand, non-materialists would say that humans have both a physical aspect and a spiritual aspect. As Christians, we are non-materialists, and would say that we are both physical and spiritual because God, a spiritual being, created us in His image. However, our physical bodies are important because God gave us bodies suited for us.

But what if materialism were true? First, self-consciousness would just be an evolutionary bi-product; something that randomly evolved to help our species survive. Secondly, we would just be a product of our genes and our environment, so free will or the ability to make decisions would be an illusion. This implies that our thought life, our prayers, and everything that dictates our identity is nothing more than neurons firing.{1} And from this we can conclude that our beliefs are unimportant because we really can not trust them anyway. They might be caused by a misfiring neuron. But is this what the data shows us?

In this article we will be looking at some examples in neuroscience that seem to contradict materialism, and to guide us we will be using the recently released book, *The Spiritual*

Brain by Mario Beauregard and Denyse O'Leary. We will look at some experiments materialists have tried to do to explain religious experiences and their effects on the body. Then we will look at some experiments that can only be explained from a non-materialistic worldview. Finally, we will see how the data from neuroscience fits within a Christian view of the mind and brain.

The Spiritual Brain does not take a distinctly Christian perspective. So while the studies within this book do not necessarily confirm or deny that Christianity is the "best" religion, it is still useful for apologetics. First, it allows us to break through the language barrier between a materialist and a Christian by looking at data in general neuroscience terms. Second, science studies the world around us, which is God's general revelation, and while this gives us truths about the character of God and His creation, our interpretation of the data must be filtered through the lens of the special revelation of God's Word.

Is God All in Our Heads?

Is there a part of our brain that creates God? Are some people genetically predisposed to being religious? A materialist would say "yes" to these questions. However, as the book *The Spiritual Brain* shows us materialists have not been successful in proving this.

Dean Hamer, geneticist and author of the book *The God Gene*, proposed that some people are more religious than others because they have one DNA letter that is different from non-religious people.{2} While this story was touted as a breakthrough in the media, the scientific community was not amused. Hamer's experiments were not well-defined, and no one could replicate them.{3}

Another popular theory is that people that have a religious experience may be suffering from mild forms of temporal lobe

epilepsy. Basically, a misfiring in the brain causes people to be obsessive about something, like religion. These scientists speculate that people like Mother Teresa, Joan of Arc, and the apostle Paul are likely candidates for temporal lobe epilepsy.{4} Epilepsy specialists, however, do not believe that religious experiences are characteristic of temporal lobe epilepsy, and usually seizures are not associated with peace, tranquility, or religious visions. Also, temporal lobe epilepsy is quite rare, yet over sixty percent of Americans have reported having some kind of religious or mystical experience. And as we will see, many parts of the brain are involved in religious experiences, while temporal lobe epilepsy is much more centralized.{5}

Perhaps one of the strangest experiments to hit the popular media was that of the God Helmet. Neuroscientist Michael Persinger claimed that religious people were more sensitive to magnetic fields, and that electromagnetic radiation was what prompted religious experiences. He developed a helmet that produced strong electromagnetic waves. Several people who tried on the God Helmet reported having a religious or mystical experience of some sort. However, there were some fundamental flaws in the whole setup, including the fact that Persinger never published his results and did not have brain scans to back up his statements. Eventually, a group of scientists from Sweden, using a double-blind test, proved that the God Helmet was really the power of suggestion. The electromagnetic waves didn't cause the religious experiences.{6}

Experiments That Don't Mind

All of these failed experiments presumed that there is no God and there is no spiritual component to people. We have shown, however, how the evidence from neuroscience doesn't seem to fit the materialistic worldview. As we will see, some experiments reported in *The Spiritual Brain* cannot be

explained from this worldview. What we will find is that they fit nicely within a Christian worldview.

The first example is obsessive compulsive disorder therapy. Obsessive compulsive disorder, or OCD, occurs when a person has distressing or unwanted thoughts that dominate their thinking, and these obsessions trigger an urge to do some kind of ritual behavior, also known as a compulsion. The interesting thing about OCD is that the person knows that the obsession is irrational and the ritual won't really fix it, but their feelings tell them otherwise. Scientific studies have shown that the brain is actually misfiring. The part of the brain that tells a person, "There's a problem, do something to fix it," is firing at the wrong times. OCD is a clear case of a healthy mind and a malfunctioning brain.

A materialistic worldview would say that the only way to treat OCD is by *physically* fixing the bad neurons. However, the treatment that actually works involves the patients *mentally* fixing the bad neurons. Patients learn to take control of their OCD by recognizing when their brain is misfiring, and try to starve the urges to do the ritual. After treatment, brain scans show that the brain of an OCD patient is starting to fix itself. The patient is changing his physical brain with his mind!{7}

Similar kinds of therapies have been applied to depression and phobias.{8} In both cases, *The Spiritual Brain* reports instances where a patient's brain chemistry was directly affected by their mind.

Another phenomenon that can't be explained from a materialist's worldview is the placebo effect. The patient is given a medicine that they are told will help them, but in actuality they are given a sugar pill. Interestingly, the patient's belief that the sugar pill will help them has caused measurable, observable relief from symptoms. Many doctors say that a patient's attitude oftentimes can help or hinder real

medicines or therapies from working.{9}

The ability of the mind to change the brain's chemistry does not fit within a materialistic worldview. But as Christians we know that our minds are very real and can have a very real effect on our physical bodies.

Can We Take a Brain Scan of God?

As noted previously, the popular worldview among neuroscientists is materialism, which essentially means they do not account for or acknowledge spiritual effects on the brain nor do they believe that there is a spiritual component to the person. This would mean that even religious experiences are just our neurons firing. Materialists would claim that either the effects of religious experiences, including prayer, are neurons misfiring, or the person is faking it.

On the other hand, Christians believe that there is a spiritual realm, and there is a spiritual component to human beings that we call the mind or the soul. We believe that when we pray that we are actually praying to God who is real and separate from us, not just a figment of our imagination.

Mario Beauregard, one of the authors of *The Spiritual Brain*, took brain scans of Carmelite nuns while they were remembering the deepest and most poignant religious experience they had had.{10} Using functional MRI and QEEG he hoped to see what parts of the nuns' brains were active.{11}

Dr. Beauregard and his lab found that religious experiences involved many brain regions at once, which rules out materialists' suggestion that there is some kind of "God spot" in the brain.{12} They also found that brain scans during these religious experiences were very complex and consistent with something other than merely an emotional state. Lastly, they determined that the data did not have any of the markers one would expect to see if the nuns were faking it or lying.

This is all that the data can tell us. Physical machines cannot prove the existence of a spiritual God. But as the authors of *The Spiritual Brain* point out, what these experiments do show is that certain explanations, namely materialistic ones, are inadequate for explaining the data in neuroscience. The nuns are experiencing something beyond what materialism can account for.

Prayer is complex and more than just emotional contrivances, so from a Christian worldview, the results are not surprising.

The Christian View of the Mind and Brain

Experiments such as the God Helmet and theories about temporal lobe epilepsy did not work because their premise was that God was something we made up ourselves. However, as Christians we know this is false. The Bible says that God is the creator and is distinct from His creation, not made from it.

The results of experiments with OCD, phobias, depression, and the placebo effect do not make sense to materialists because the mind seems to affect the physical brain. However, we know from Scripture that the mind, or the soul, is an essential part of our being. James 2:26 and Luke 8:55 show us that when the soul leaves, the body is dead, and when the soul returns, the body is alive. Also, passages such as Matthew 26:41 and Romans 8:10 and 11 tell us that our spirit can affect what our bodies do and keep us from sinning. Passages about the resurrection such as in 1 Corinthians 15 discuss the distinction between our spirit and our physical body.

Lastly, the experiment with the Carmelite nuns showed that during a deeply prayerful experience, their brains display signs of a very complex interaction that is going on. As Christians, we believe prayer is a way to interact with the Creator Who is separate and distinct from us. While this experiment does not prove God’s existence, it is reasonable to conclude that it is the level of complexity we would expect to

see if someone were interacting with something distinct from themselves.

At one time people feared that neuroscience would be the death of God. The fear was that science might prove that everything that we do, including prayer and worship could be reduced to neurons firing in our brains. Hopefully, you are convinced that neuroscience actually points us towards God. There is evidence for a spiritual component of the human self. And, the evidence is consistent with what we would expect from a Christian worldview.

Notes

1. Mario Beauregard and Denyse O'Leary, *The Spiritual Brain* (New York: Harper Collins, 2007) 3, 4.
2. Ibid., 48-50.
3. Ibid., 51, 52.
4. Ibid., 58, 64.
5. Ibid., 72, 71.
6. Ibid., 79-100.
7. Ibid., 126-130.
8. Ibid., 133-140.
9. Ibid., 141-142.
10. For a detailed account of the Carmelite nun experiment see Beauregard and O'Leary, *The Spiritual Brain*, 255-288.
11. Two things we must keep in mind. First, usually the brain will take the same pathways when it remembers an event as when the event actually happened. Second, this experiment can't tell us what the nuns were actually thinking, but it can tell us what kind of brain activity was occurring.
12. Beauregard and O'Leary, 42-44.
13. For more articles and information on the subjects covered in *The Spiritual Brain* see Denyse O'Leary's blog, Mindful Hack, at mindfulhack.blogspot.com.
14. See also Kerby Anderson's article "Mind, Soul and Neuroethics" at www.probe.org/mind-soul-and-neuroethics/.

The Mitchell Report: Christian Response to Steroids in Sports

Heather Zeiger considers the question of how Christians should respond to the revelations regarding steroid use in sports. The Mitchell report is one example accompanied by many others such as the U.S. Anti-Doping Agency report on cyclist, Lance Armstrong. Heather takes a biblical worldview perspective on this issue taking into consideration their impact on our bodies, our perception of the world, and the perception of young people on what is acceptable in our society. As a Christian, their are numerous reasons not to take steroids and not to glorify the accomplishments of those who do.

Former Senator George Mitchell was charged to investigate and document the prevalence of steroid and human growth hormone use in Major League Baseball. The objective of the report was not only to bring to light the steroid problem, but to offer solutions to help eradicate its use and abuse. Senator Mitchell specifically wanted "the media to focus less on names and more on central conclusions and recommendations of the report."{1}

Later this month and in February, hearings before the House Committee on Oversight and Reform will be held to determine if stronger penalties for steroid use and more rigorous testing are appropriate. The committee will also investigate whether certain athletes are guilty of using performance enhancing drugs. This has brought the topic of steroid abuse in sports

to the forefront of the media, providing an excellent opportunity for discussion.

Sport is an important part of life. The Apostle Paul wrote about running and boxing, and used it as an analogy for the Christian walk.{2} And unlike the Gnostics who despise the body, we honor it as part of our *imago dei* or being created in God's image (for more information see Bodybuilding: Edifying Thoughts About Our Bodies by Michael Gleghorn). So as Christians, we embrace playing sports and exercise. But like so many things, there is a way to play sports that is consistent with a Christian worldview and a way that is not. There are both physical and biblical reasons why steroid use is dangerous and unethical.

What are Steroids?

The first reported use of performance enhancers was in 776 B.C.{3} when athletes would eat sheep testicles to increase their testosterone levels. Today athletes don't use sheep, but the intention is still to increase their testosterone beyond natural levels. Steroids are chemicals that are either a form of testosterone or a testosterone precursor. *Anabolic androgenic steroids* (AAS){4} increase muscle mass and muscle recovery by producing five to thirty times the testosterone that the typical male body produces.{5} Athletes who abuse steroids do see an increase in muscle mass and/or speed, and at first, will see improvements in their performance. ESPN's *The Dope on Steroids* reports that steroids can make the body as much as 50 percent more muscular than is possible without them.{6}

Using steroids to increase muscle strength is illegal, but there are many forms of steroids that remain undetectable in drug tests making it difficult to regulate their use. Furthermore, players have also abused another illegal, undetectable drug called *human growth hormone*, which is not a steroid, but is often used in conjunction with steroids to

make a player bigger and to speed injury recovery.{7} Random drug testing creates controversy over privacy violations, and announced tests are easy to beat. By using water-based steroids, it only takes a couple of weeks for players' bodies to dilute the chemicals to undetectable levels.

While steroids do produce short-term results, the side effects and long-term effects can be devastating.

The Problem

Side-Effects

Physical side-effects from steroid use include increases in cholesterol, acne on arms and back, increase in blood pressure, stiffening of heart tissue, increased production of body hair yet decreased production of scalp hair, stunted growth, hypogonadism (diminished hormonal or reproductive functioning in the testes or the ovaries), sexual dysfunction, and increased risks for both strokes and heart attacks. Psychological side effects include aggressiveness, depression, and addiction/dependence. See Dangers of Steroid Abuse for a more detailed look at these and other possible side-effects to steroid abuse.

Influence on Teens

Athletes are role models for kids, and some studies indicate that athletes are second only to parents in their influence on teen choices. I remember watching track and field as a child and later as a teenager and being captivated by the runners. They had this combination of grace and strength that I admired, so I eventually took up running.

Kids turn to athletes for inspiration all the time, but the problem is they also believe that the athletes are successful because they use steroids. Take this testimonial from www.steroidabuse.com as an example:

> *For me, taking steroids was a natural move. I was an athlete in high school and got a college scholarship to play football at a major university. Between my senior year of high school and my freshman year of college I started my first cycle because I thought I needed to be faster. I took injectable testosterone and winstrol. I figured that winstrol must be good because it's what Ben Johnson got busted using. I wanted to be fast like him.*
>
> *I was getting stronger at every workout and feeling great. I had heard that steroids can make your joints weaker but I figured Ben Johnson didn't have that problem, so it was probably just a rumor.{8}*

Another testimonial discusses how a parent's obsession with his son, Corey, and his athletic success eventually lead him to administering steroids to Corey when he was only 13. He thought this was how the pros compete. In the end, Corey, now 18, comments about his steroid experience:

> *As Corey tries to scrounge together enough money to get his own place, one point still gnaws at him: He firmly believes he could have been a champion without pharmacological enhancement.*
>
> *Soft-spoken and reserved, Corey wavers among embarrassment, regret and awe when he reflects on his fractured teenage years and his experiment with steroids. "People make it sound like these medications are only performance-enhancing, but they have a huge mental impact as well," he says. "By the time I was done, I was a wreck…."{9}*

And as the Mitchell Report stated, "After the Associated Press reported Mark McGwire was using androstenedione (a testosterone precursor)…sales of that substance increased by over 1000%."{10} Athletes have a strong influence on people,

especially teens.

The Christian Worldview

When the news of Barry Bonds' alleged steroid use broke last summer, *Newsweek* commentator George Will observed that "Athletes who are chemically propelled to victory do not merely overvalue winning, they misunderstand why winning is properly valued…. In fact, it becomes a display of some chemists' virtuosity and some athlete's bad character." He later adds that "the athlete's proper goal is to perform unusually well, not unnaturally well."{11} We have a moral foundation for these points in God's word.

First of all, steroids cause the body to be enhanced beyond what it was designed to do. We believe that God has designed us with his purposes in mind, and he has gifted people with different talents and abilities. From an engineering perspective, he put the parts together with a particular design in mind, so when a steroid user becomes stronger than that for which he was designed, the rest of the parts, his joints, tendons, and ligaments, become damaged.{12}

Secondly, steroids are often taken for cosmetic reasons—usually by men obsessed with acquiring a certain physique. As we see from Scripture, this is a disproportionate view of the human body. The Bible tells us to offer our bodies as living sacrifices.{13} And as we see in Luke 12:22-34, Jesus tells us not to worry over what we will eat or drink and what to wear, that He will provide what is necessary. This puts the body in its proper perspective as something to care for, but not something to obsess over.

Lastly, there is a character issue here. Consider the Apostle Paul's view of weakness, which we could apply to physical weakness as well:

> *So to keep me from being too elated by the surpassing*

> *greatness of the revelations, a thorn was given me in the flesh, a messenger of Satan to harass me, to keep me from being too elated. Three times I pleaded with the Lord about this, and that it should leave me. But he said to me, "My grace is sufficient for you, for my power is made perfect in weakness." Therefore I will boast all the more gladly of my weaknesses, so that the power of Christ may rest upon me. For the sake of Christ, then, I am content with weakness, insults, hardships, persecutions, and calamities. For when I am weak, then I am strong. (2 Corinthians 12:7-10, ESV).*

As Christians, we believe in being good stewards of our health, but there is a difference between "therapeutic" and "enhancement." Therapeutic medical advancements alleviate the effects of the fall of man, such as death and suffering. Enhancements involve man trying to become what he deems as "better" than how God made him, which essentially was the very cause of the fall. Obviously, there is gray area here, but this helps us make some distinctions. As we see from Paul's statements, the human idea of weakness is not necessarily God's idea of weakness. God's view is that in our weakness Christ is glorified.

Notes

1. Mitchell, George L. "Report to the Commissioner of baseball of an independent investigation into the illegal use of steroids and other performance enhancing substances by players in major league baseball," Dec. 13, 2007, Office of the Commissioner of Baseball, pg. SR 35-37.
2. 1 Corinthians 9:24-27 (ESV)
3. www.steroidabuse.com
4. *Anabolic* = metabolic process of building larger muscles from smaller ones, *Androgenic* = production of male traits
5. Mitchell, pg. 7. The complete Mitchell report can be viewed at Major League Baseball's official site: mlb.mlb.com/mlb/news/mitchell/index.jsp

6. sports.espn.go.com/specialdesign/steroids/window.html
7. Both Anabolic steroids and human growth hormone (HGH) are legal when used for prescribed medical reasons. Muscle growth or cosmetics is not an FDA approved medical use for either of these drugs.
8. www.steroidabuse.com/true-stories-of-steroid-abuse.html
9. sportsillustrated.cnn.com/2008/magazine/01/15/sins.of.a.father0121/index.html
10. Mitchell, pg. 16.
11. George Will, *Newsweek* , May 21, 2007, www.newsweek.com/id/34762
12. Genesis 1:27, Psalm 139:13-16, Proverbs 16:4 (ESV)
13. Romans 12:1,2 (ESV)

A Meaningful World

The Poison of Meaninglessness

We have been drinking a poison that first infects our heads, then slowly moves to our hearts. It is the poison of meaninglessness. Many people assume that science says the universe is without purpose and everything is a result of random, meaningless events. A recently released book, *A Meaningful World* by Benjamin Wiker and Jonathan Witt,{1} seeks to be the antidote to this poison by looking at science and how certain features of the universe do not fit within the

materialistic worldview. This book will be our guide as we consider the question, How does science reveal meaning in the universe? But first, we need to understand the poison before we can discuss its antidote.

Within the scientific community, the assumption of meaninglessness is a result of its members' worldview. Most scientists hold to a materialistic worldview where everything is explained by physical or material causes, which are purposeless, random, natural events. Furthermore, a materialist reduces everything to its basic parts and claims that ultimate meaning lies in these parts. For example, when people say that we are a product of our genes, they are reducing humans to their chemical parts. By this definition, people do not have a soul, and the illusion of human genius or creativity is explained as neurons firing in the brain or animal instinct.

So if that is the poison, what is the antidote? The antidote comes from Christians who break the materialist spell by showing that the world is full of meaning and purpose because it has a Creator. This can be done by looking at scientific evidence for a meaningful world.

A good place to begin is with the idea of genius. Why study genius? Because the most poisonous effect of materialism is the way it skews our self-understanding or our worldview. In a materialistic world without a purpose, there would be no signs of creativity and genius in nature. Before Darwin's time, the evidences of creativity and beautiful design in nature were some of the best arguments against materialism. However, the theory of evolution through random, natural causes denied the masterful work of design.

First, we will learn how to recognize some common elements found in a work of genius by looking at one of the most well-known geniuses of all time, William Shakespeare. Then, we will see if those same elements show up in nature.

How Do We Know It's Genius? The Example of Shakespeare

A Meaningful World describes four elements that will show up in a work of genius: depth, clarity, harmony, and elegance. If the world is designed by an ingenious designer, then we should see these four elements of genius in nature.

How do we detect genius in nature? Let's take a look at the work of a well-known playwright, William Shakespeare, as our model for describing the elements of genius.

Consider the situation in *Hamlet* where we get the famous and often misused line, "Methinks it is like a weasel."{2} The surface reading is that Hamlet and Polonius are looking at clouds and Hamlet observes that one looks like a weasel. As we delve deeper and consider the context, we find that Hamlet is actually exposing Polonius as a weasel himself.

The deeper meaning in Shakespeare's work has intrigued academics for years. And it points us to our first character of genius, *depth* or depth of meaning.

However, depth is nothing if it cannot be detected. So here we come to our next element of genius, *clarity*. Shakespeare did not write the scene with Hamlet and Polonius for his own whimsy, but so that the reader would detect the double meaning in Hamlet's weasel comment. Ingenious works have depth and meaning that beg to be discovered. Hence, they have clarity.

The last two elements of genius go hand in hand: *harmony* and *elegance*. Harmony would describe how various parts—or in Shakespeare's case, how various scenes—are interrelated. In all of Shakespeare's plays, the characters and scenes are related to each other; no scene is random or contradictory to the rest of the play. They are in harmony with each other.

The last element, elegance, is not about parts but about the

unifying whole. When all of the parts have come together and operate harmoniously, then we have a new element, in this case a play. No one scene stands alone, but is within a context of the whole. One cannot understand the line “Methinks it is like a weasel” without setting up the context of the play itself.

So from Shakespeare we have identified four important elements to genius: depth, clarity, harmony, and elegance. Let’s see if we can find these same elements in nature.

Genius in the Periodic Table of Elements

When we turn to chemistry to see if we find a conspiracy of ingenious design, we will find that, just like a cleverly crafted puzzle that was meant to be solved, when you arrange the elements according to weight, the periodic table makes a stunning natural jigsaw puzzle.

Now that scientists have solved the jigsaw puzzle, they find that it gives us amazing information about atomic properties. This insight has allowed us to make everything from pharmaceuticals to cosmetics to weapons to particle accelerators. So is it just coincidence, or does the periodic table display the properties of ingenious design?

Let’s consider how the periodic table works. When you line the main elements up in groups of eight, the periodic table functions much like a Sudoku puzzle. Elements going across a row, or period, are related in their structure, while elements going down a column are related in their properties. Sudoku puzzles are designed by the puzzle maker with just the right amount of clues for the puzzle to be solved. If you look at the history of chemistry, you will find that the periodic table was first put together because there just happened to be the right amount of clues to give us a reason to be suspicious of design.

Remember those four elements of Shakespeare’s work: depth,

clarity, harmony, and elegance? It turns out that when we consider the periodic table, these properties across rows and columns display a *depth* of meaning beyond the obvious weight of elements. Secondly, its properties are clear enough for us to discover them, so it has *clarity*. The jigsaw puzzle of the elements arranged in this way display a *harmony* that sings sweetly to chemists' ears; for example it turns out that elements on the right of the table generally combine with elements on the left of the table. Third, the periodic table of elements is *elegant* in how it operates as a functioning whole. We could not know the characteristics of many of the elements without having other elements to compare them to. In this sense, the table reads like a play in which each element is a character whose personality is only really seen in light of the entire cast of characters.

Although a materialist would say that we are nothing but chance chemical reactions, it seems that our chemistry is not so random after all, but that it was designed with us in mind. Next we will find mathematics and physics also have the properties of ingenious design.

Genius in Mathematics and Physics

The worldview of many scientists would have us believe that the universe is meaningless because it is the result of chance random processes. In mathematics, a language of the universe, do we find the handiwork of genius designer?

In the book *A Meaningful World*, the authors emphasized the *clarity* of mathematics because the ability of the human mind to discern mathematical principles is quite remarkable. The universe seems to follow certain mathematical laws: the pattern of the multiplication table, musical scales, and the beauty of symmetry. These mathematical laws, however, are not elusive. Since ancient times man has been able describe truths about nature in terms of numbers, counting, and patterns.

We can easily find the *harmony* and *elegance* in the language of nature by looking at mathematics and physics. Math has harmony because, starting with basic arithmetic, you can build all the way up to complex principles like calculus and trigonometry. The elegance of mathematics is really seen when applied to physical phenomena. After many years of experiments, we have discovered that the complicated idea of gravity can be described by one simple equation. This is natural elegance.

The *depth* of mathematics is more difficult to grasp because we are so accustomed to using math. After Newton's time, mathematics seemed to be the end all, be all, of the universe. This was stretched to the point that some worshipped mathematics over God. But soon mathematicians and scientists found that we did not actually have the whole picture. With Einstein's theory of general relativity and quantum mechanics, mathematics grew as a field and continues to grow and refine.

Although mathematics is an abstract idea, it is the language of the physical world. As we have seen, mathematics and the way it describes physical phenomena displays clarity, depth, harmony, and elegance. Math is the language that God invented. And it is one of the ways that He speaks to us of His existence.

Genius in Biology

Since Darwin's day, biology has been infused with the idea that everything from bacteria to human beings has sprung from the result of random, purposeless, natural causes. But nature seems to show the fingerprints of the creative genius of our creator, God.

Can we see those signs in biology? *A Meaningful World* describes harmony within biology at length. Let's take a look at the cell.

The cell contains many parts: the mitochondria, the nucleus,

and DNA. Each of these parts has its particular job to do. And, in addition, each part has a job that is related to all of the other parts of the cell. Think of the cell like a car engine and mitochondria as the carburetor. A carburetor has a specific job in the engine. You cannot talk about what a carburetor is without explaining how it works within the engine. Its job is related to all of the other parts. This is *harmony*, one of our elements of genius.

But what about elegance, depth, and clarity? It seems that these are also apparent in biology. The *elegance* of the cell is how it functions as one intricate machine, like our car engine. The cell is a biological engine; actually it is a very efficient, self-sustaining, self-replicating engine.

What about depth in biology? Let's go back to the cell. Cells get their energy through metabolism. We used to think that this was a simple path with many useless byproducts. Upon closer inspection, one sees that those byproducts have functions within the cell that are necessary for its survival. As we continue to study the cell, we find more and more *depth* to its function.

Finally, how does biology demonstrate *clarity*? Were we meant to find the handiwork of a designer? Most biologists would agree that biology is the study of things that have the appearance of design. If it appears designed perhaps it was, and perhaps we were meant to discover that. The genius behind biology is clear enough that God says that we are without excuse.{3}

Hopefully, you can see that creation is a masterful work of a divine genius. As the book *A Meaningful World* has shown us, nature bears the hallmark of design that has us, its students, in mind.

Notes

1. Benjamin Wiker and Jonathan Witt, *A Meaningful World: How*

the Arts and Sciences Reveal the Genies of Nature (Downers Grove, Ill.: InterVarsity Press, 2006).
2. Hamlet Act 3, Scene 2
3. Romans 1:19,20 (ESV)

Michael Moore's Sicko Healthcare Perspective

June 29, 2007 marked the official opening of Michael Moores newest mockumentary, *Sicko*. And in true Moore form, it is controversial and in-your-face. The subject this time is a critique on the American Healthcare system, and as before, Moore takes a liberal stance on a pet cause: healthcare reform. Here is a summary of his proposal:{1}

> *1. Every American must have full, uninterrupted healthcare coverage for life.*
> *2. Private, for-profit health insurance companies must be abolished.*
> *3. Profits of pharmaceutical companies must be strictly regulated like a public utility.*

After researching several movie reviews from every part of the political spectrum, I am concerned about Moore's use and misuse of statistics and convolution of facts that are taken out of context. However, I think this provides an excellent opportunity to open the discussion on the Christian perspective on healthcare. I will mainly address the idea of universal healthcare coverage (Moore's point 1) and offer a slightly different perspective on private health insurance

companies (Point 2). I'll save pharmaceutical company regulation for another article.

The Biblical Perspective

Before we can apply biblical truth to today's cultural issues, let's make sure we know what is biblically clear about healthcare. Several places in the Bible, God admonishes his people to care for the orphans and widows.{2} Orphans and widows are the vulnerable in society. In today's society, that status falls mainly to the elderly, the chronically ill, the poor, etc. The Bible is quite clear about the need to care for these people as well as an individual's responsibility in the matter:

> *When you reap your harvest in your field and have forgotten a sheaf in the field, you shall not go back to get it; it shall be for the alien, for the orphan, and for the widow, in order that the Lord your God may bless you in all the work of your hands. When you beat your olive tree, you shall not go over the boughs again; it shall be for the alien, for the orphan, and for the widow. When you gather grapes of your vineyard, you shall not go over it again; it shall be for the alien, for the orphan, and for the widow. And you shall remember that you were a slave in the land of Egypt; therefore I am commanding you to do this thing.{3}*

This principle is exemplified when Boaz allows Ruth to glean from his field, drink from his water vessels and eat at his table.{4}

The biblical model seems to be that those with plenty are to take responsibility for those that are vulnerable. While government intervention is not explicitly mentioned, the mention of orphan- and widow-care in the Law implies a universal understanding of a duty to care for the least of these. It also seems to indicate that those who are healthy

(i.e. who can work in the field, harvest their own crops, etc.) are to be held accountable and responsible for themselves. In practical terms, how do we apply this to our own culture and healthcare systems?

Modern-Day Applications

In Kerby Anderson's article on National Healthcare,{5} he suggests three needs in today's healthcare structure, each related in such a way that one would perpetuate the others:

The Need for Personal Responsibility

He brings to light an important point about human nature: when someone else pays, we are less likely to consider the quality and cost before buying. When the government subsidizes healthcare or health insurance, people tend to be less thoughtful on cost, and the result is the high prices of healthcare. If there were more personal accountability, people would comparison shop and bring market pressures to bear on some of the healthcare costs.

I find it fascinating that health insurance requires so little personal responsibility, while car insurance demands so much. When I buy car insurance, it is only used in the event of an accident, either caused by nature or another driver. I have my own account that I use for my basic car care needs (gas, oil change, registration, tires, cleaning, brakes, etc.). I shop for the cheapest gas prices, the best bang for my buck on oil changes, and will go out of my way for a cheaper car wash. Why? Because it is coming out of my pocket. When I was in an accident, the insurance company was paying, so my car went to the body shop they specified and the company paid the price the shop requested. Honestly, I was less concerned about how much the insurance company paid than whether I got my car back in one piece.

Why is it that most people want insurance to pay for their

basic check-ups that occur annually or biannually? If individuals paid for their regular maintenance, this would not only decrease the cost of health insurance, but it would also free up some resources for the orphans and widows of our society so that they, too, might have regular, preventative healthcare.

The Need for Portability

Anderson continues:

> *Americans usually cannot take their health insurance with them if they change jobs. A fair tax system would offer no tax subsidy to the employer unless the policy was personal and portable. If it belongs to the employee, then it would be able to go with the employee when he or she changed jobs. Health insurance should be personal and portable. After all, employers don't own their employees' auto insurance or homeowners insurance. Health insurance should be no different.{6}*

This is a critique on the requirement of employers to provide health insurance, and also argues for private companies to be made available to individuals. My husband and I are young, healthy individuals, and were paying $450 per month on his prior health insurance, until he changed jobs. The problem is that $450 counted as part of his earnings, and when he left his job, we lost the amount paid into the insurance. Our car insurance and renters insurance was unaffected by his job change, but our health insurance ceased. We now see that it would have been more valuable to have a portable insurance option, such as a private company or a tax-deductible health account into which we would deposit money directly. This would also tie into the idea of individual responsibility for one's health finances, and, again, applies to those that can afford it while the vulnerable are provided for.

The Need for Price Fairness

Anderson writes:

> *Price fairness is another issue. Proponents of socialized medicine would force people with healthy lifestyles into a one-tier system with people who smoke, drink too much, use drugs, drive irresponsibly, and are sexually promiscuous. A better system would be one that rewards responsibility and penalizes irresponsibility. Obviously we should provide for the very young, the very old, the chronically ill, etc., but we shouldn't be forced into a universal risk pool and effectively subsidize the destructive behavior of those who voluntarily choose sin over righteousness.{7}*

Going back to our car insurance/health insurance comparison, my husband and I have been with our car insurance company with a clean record for so long that our rates went down. Also, our rates decreased when he turned twenty-five because he was no longer a high-risk driver. This encourages cautious driving and places the responsibility on the driver. The universal healthcare model does just the opposite, because no matter your lifestyle, the government will take care of it. I think if we're honest with ourselves about human nature, a monetary compensation or savings for maintaining proper health would be one effective way to combat behavioral diseases such as obesity and type II diabetes.

Problems with Universal Healthcare, or Why Michael Moore May Not Know What is Best for the Country

Business Costs

I am no economist or a business analyst, so I will defer to Anderson's example of Herman Cain, president and CEO of Godfathers Pizza. Mr. Cain confronted President Clinton about

many of the hidden costs of healthcare reform that affect businesses. He came with spreadsheets that pointed out just how much it would cost his business if employer mandates were put in place, and it also pointed out how President Clinton had vastly underestimated the cost on businesses.

Or what about Michael Moore's suggestion of having totally socialized healthcare? He gives several countries as an example, including France, but never mentions that all of these countries pay significantly higher tax rates than we do. This would place a burdensome cost on individuals and companies.

As Kerby warns in his article, Healthcare reform may cost much more than we think it will. The direct costs may not seem like much, but don't forget to count the indirect costs to you and to American business.

Moral Costs

There are several issues to consider here, but let us focus on the one that is already taking place in many other countries with socialized healthcare: rationing. Universal coverage of healthcare increases overall demand, which means that you will have to decrease the supply of health care benefits provided to each individual citizen, especially since there is less profit and hence less reason to increase overall supply. This is inevitable in a universal healthcare system, and, as recently reported in the *Scotsman*, is already happening in countries with socialized healthcare:

> *It is no longer possible to provide all the latest [medical technology] to absolutely everybody without notable detriment to others. Rationing is reduction in choice. Rationing has become a necessary evil. We need to formulize rationing to prevent an unregulated, widening, post code lottery of care. Government no longer has a choice. When it comes to the list of conditions, it's all about quality of life. It would be*

about the prioritization of clinical need.{8}

A utilitarian approach to a person's quality of life is definitely not within the Christian worldview,{9} but that is precisely and inevitably the direction of a socialized healthcare system.

Our current healthcare system does have some flaws, but I do not think throwing government money at the problem is the best solution. Looking at the biblical model of individual responsibility, we can glean from the text how God's timeless truths can be effective when applied to our culture today.

Notes

1. www.michaelmoore.com
2. Exodus 22:22, Jeremiah 7:6,7, Isaiah 1:17, 1 Timothy 5:3, James 1:27, English Standard Version (ESV).
3. Deuteronomy 24:19-22 (ESV).
4. Ruth 2:8,9,14-16 (ESV).
5. Kerby Anderson, "National Health Care," Probe, 1994, www.probe.org/national-health-care/.
6. Ibid.
7. Ibid.
8. Moss, Lyndsay "NHS rationing is 'necessary evil,' say doctors" *Scotsman*, June 26, 2007, news.scotsman.com.
9. See Kerby Anderson, "Utilitarianism: The Greatest Good for the Greatest Number," 2004, www.probe.org/utilitarianism-the-greatest-good-for-the-greatest-number/

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.