Canyon Institute for Advanced Studies

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IN THIS ISSUE

Stem Cells, Embryos and Ethics: Is There a Way Forward?

By Dr. William Hurlbut

Dr. William Hurlbut will be presenting as part of the Canyon Institute for Advanced Studies 2006-2007 Public Lecture Series on Thursday, January 18 2007. Debra Fisher, Managing Editor of the Canyon Institute for Advanced Studies newsletter, recently spoke with Dr. Hurlbut about stem-cell research, specifically Altered Nuclear Transplant.

Dr, Hurlbut is a physician and Consulting Professor at the Neuroscience Institute at Stanford University. He has served on the President's Council on Bioethics since its creation in 2002 and is the author of the proposal for Altered Nuclear Transfer that appeared in a 2005 President's Council report.

Debra Fisher: *Can you provide our readers with a brief overview of the present conflict playing out in the realm of stem cell research? What is the core ethical dilemma?*

William Hurlbut: In 1998, two research groups announced that they had isolated human embryonic stem cells. This was an important scientific step because these cells are capable, at least in theory, of forming all the different cells, tissues, and organs of the human body. Naturally, scientists want to study these cells because it enables them to study the formation of the human organism and understand a great deal about both natural development and pathogenesis, which deals with the origins of disease. But the problem is that these cells are obtained from human embryos, and by current practice, require the production and destruction of a human embryo.

Up until now, embryonic stem cells have been isolated from embryos left over from clinical in vitro fertilization (IVF) procedures. Since these left-over cells are apparently going to be discarded, some have argued that they ought to be used for medical research. This argument alone has caused considerable controversy, but now scientists are trying to find ways to use a procedure called nuclear transfer, or somatic nuclear cell transfer (also known as therapeutic cloning) to actually generate embryos and take from them their embryonic stem cells. This procedure would involve both the creation and destruction of human embryos. Now to understand why there is controversy over nuclear transfer, it is important to recognize that there is a range of concerns about this issue, three of which I will discuss here. Those of your readers who might be interested in a

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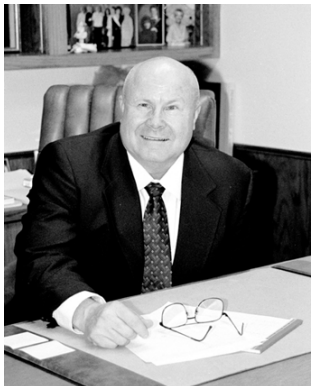
From the Director's Desk



As we approach the end of one year and ready ourselves for what lies before us, we are, as a global society, facing some of the most exciting opportunities in all human history. God has allowed us to know more about the creation of life than those who have gone before us could have ever imagined. But make no mistake, this revelatory knowledge bears a special burden of responsibility. When faced with unfathomable potential for understanding how life was created from the beginning of time and applying that knowledge to heal the sufferings of humankind—physical, emotional, and spiritual—we must respond thoughtfully and reverently. Unlike ever before, we are challenged to come together as scholars, theologians, and global citizens to wrestle with the implications of knowledge surfacing in the realms of contemporary science and theology. In such times as these, the best of Christian scholarship must be among the guiding voices.

Yet Christian scholars alone cannot find the way clear in such critical times. What is required is the thoughtful and reverent engagement of persons of faith and persons of no faith as God works through his created to show us his reality of heaven on earth. Expressions of divine action often seem to necessitate a human response. So Canyon Institute for Advanced Studies (CIAS) has sought the wisdom of two well-respected Christian scholars on the issues of stem-cell research and the origins debate—Dr. William Hurlbut and Dr. Denis Lamoureux.

In the wake of recent discoveries that are refining and sometimes redefining theory and practice in the areas of medicine and religious worship, the volume of information can be overwhelming and the content confusing. For example, the multiplicity of perspectives on somatic cell nuclear transfer and Intelligent Design theory generate inconsistent terminology that introduces contradictions within and across disciplines. When considering how these contradictions can frustrate scholars and confuse the citizenry, those of us at CIAS realized that we must expand our focus on a specific aspect of our mission: to disseminate information and perspectives to assist people of faith in the global community in developing sound, coherent, and informed foundations for engaging the exciting opportunities that lie before us. As such, Debra Fisher, Director of Public Education and Communications, spent time interviewing Dr. William Hurlbut and Dr. Denis Lamoureux in preparation for their upcoming presentations for the Canyon Institute for Advanced Studies 2006-2007 Public Lecture Series. Both lectures will be held in the Williams Building Lecture Hall on the campus of Grand Canyon University.

In addition to his work as a physician and Consulting Professor at the Neuroscience Institute at Stanford University, Dr. Hurlbut has served on the President's Council on Bioethics since its creation in 2002. As the author of the proposal for Altered Nuclear Transfer that appeared in a 2005 President's Council report and with his medical background, he is especially positioned to address the issues of stem-cell research. Dr. Hurlbut will be lecturing on the topic of "Stem Cells, Embryos and Ethics: Is There a Way Forward" on Thursday, January 18, 2007.

Dr. Lamoureux is an assistant professor of science and religion at St. Joseph's College in the University of Alberta. He holds three earned doctoral degrees: dentistry, theology, and biology. He has debated leading anti-evolutionists Philip Johnson, Michal Behe, and Jonathan Wells. With Johnson, he co-authored *Darwinism Defeated? The Johnson-Lamoureux Debate on Origins*. Undoubtedly, Dr. Lamoureux's scholarly background and his pastoral perspective uniquely position him to provide guidance for a global conversation about the origin of the universe and life. Dr. Lamoureux's upcoming lecture is entitled "Beyond the 'Evolution vs. Creation' Debate, which he will be presenting on Thursday, February 22, 2007.

These two Christian scholars will help us step into the New Year as we struggle to develop informed positions about issues of critical importance in terms of scholarly awareness, theological awareness, and public awareness. It is my hope that the interviews contained within this special expanded issue of our newsletter serve us well as we move forward—responding thoughtfully and reverently to the opportunities that are spread out before us. I look forward to visiting with you at the January and February lectures, which, as always, are free to the public.

Bill R. Williams
Director

Letters to the Editor and Requests for Reprints

We welcome letters to the editor of up to 200 words. They may be edited for clarity and length. Letters selected for publication may be published or distributed in print, electronic or other forms. We hope you will write to let us know how our educational offerings are impacting your world.

Requests for reprints of material printed in this newsletter should be addressed to:

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Stem Cells, Embryos and Ethics: Is There a Way Forward?

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more in-depth treatment of these issues may visit a Web site that I established: www.alterednucleartransfer.com.

The first and most general concern is voiced by those who feel that scientists are beginning to tamper with issues of human biology that are too close to the core of human dignity. They are concerned that perhaps our powers are getting too great for our wisdom. The opponents of nuclear transfer would argue that we are trying to gain control over everything in order to become the masters of nature and of human nature, which has long been a goal of biotechnology. They fear that use of such technology may lead to unforeseen undesirable consequences as well as being intrinsically morally wrong. However, the amazing possibilities as well as potential problems related to this level of mastery are now becoming more evident, so there is controversy over how to balance the benefit of new medical therapies against violation of fundamental moral principles.

A second and related practical concern is that current methods for obtaining eggs for nuclear transfer procedures, which are the same methods used to obtain eggs for in vitro fertilization, involve giving a woman a higher than normal dose of hormones in order to induce the formation of an unnaturally large number of oocytes, also called eggs. The average ovulation for a woman usually produces one or, at the most, a few eggs. With chemically induced super-ovulation, the woman will produce usually 12-15 eggs. Chemically induced super-ovulation is performed during in vitro fertilization as a means of generating enough eggs so there are successful products of fertilization and enough embryos to implant in the woman's womb. Usually, this procedure results in the fertilization of about half of the eggs, while the remaining eggs are either a little too immature or have something wrong with them. Typically, somewhere between three to seven embryos are produced. However, normally no more than two or sometimes three embryos are implanted in the woman's womb. The remaining embryos are then frozen. Currently in the world, an estimated 1 million frozen embryos exist, and in the United States alone, an estimated 400 thousand embryos are being stored. Most of these frozen embryos are designated for future use by the couple to have children. Only a small number, maybe 10 thousand, have been officially designated as a resource for research. It is estimated that scientists could obtain a few hundred stem-cell lines using these 10 thousand embryos.

However, because this procedure of super-ovulating women involves a series of injections that create hormone levels that are far greater than the natural physiological levels, it does have unnatural effects on the woman's body. In a certain number of cases, there is an adverse reaction and occasionally a death occurs. I personally don't think we should be super-ovulating women just for the purpose of obtaining eggs for research right now. Scientists are working on other ways of obtaining eggs without risking a woman's well being. Indeed, the science is encouraging in this area.

What scientists are currently emphasizing is to have federal funding for research on embryos left over from IVF that have been designated for research in order to make more stem-cell lines. Most of all, however, they eventually want to be able to use eggs to directly create new embryos using nuclear transfer, which is also called embryo cloning. Using nuclear transfer procedures, scientists could produce embryonic stem-cell lines that are genetically identical to the patient from whom the original cell nucleus was obtained. There are two reasons why this procedure is important. First, nuclear transfer would allow the study of the patient's own genetically specific cells in order to better understand the development of disease and design pharmaceuticals for that specific disease. Second, it may be possible to eventually do direct cell therapies with tissue-compatible cells that wouldn't be rejected by the patient's immune system.

Obtaining embryonic stem cells via embryo cloning destroys embryos, just as obtaining them from IVF embryos does. But embryo cloning introduces additional moral complexity because unlike use of IVF embryos, embryo cloning deliberately creates human embryos in order to destroy them for their stem cells. There are good scientific and philosophical reasons for believing that human life begins at conception (or, in the case of cloning, at its biological equivalent). Such creation and destruction of human embryos therefore violates the sanctity of human life and uses it instrumentally as a mere laboratory resource. But human life is the one thing that is set aside in all of the natural order that should be given an inviolability and respect that we do not give to any other inanimate or animate object. Such violation of human life is the third, and most serious ethical concern.

DF: *You are referring here to the sanctity-of-life principle. Can this ethical dilemma be characterized differently from a national perspective as opposed to a global perspective?*

WH: From a national perspective, the use of embryonic cells is perfectly legal in the United States. There are no federally legislated constraints on the use of these embryos. Decisions related to the use of these cells are made at the level of the states, and some states accept this practice and some do not. It's important to note that legislative proposals (pro or con) are numerous, and some even polarize the issue on public ballots, but, to date, most states have not explicitly ruled on matters related to stem-cell research. However, there has been a long standing prohibition against the use of federal funds for anything that endangers or destroys a human embryo; this is called the Dickey Amendment. Congress passed the Dickey Amendment in 1996 as a way of overriding President Clinton's executive order that the National Institutes for Health establish guidelines for regulating the use of left-over IVF embryos for research purposes. This Congressional legislation had the result of effectively constraining the largest supporter of scientific research in the world—the National Institutes of Health (NIH)—from funding embryo-destructive research. When embryonic stem cells were isolated a couple of years later, the significance of this restriction be-

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came more apparent and some sought ways to bypass the legislative constraints. In the final year of the second Clinton administration, lawyers at the Department of Health and Human Services suggested that the Dickey Amendment might still allow research on embryonic stem cells if the actual destruction of the embryos was carried on in privately funded labs and the cells were then brought back into NIH supported research facilities. Others, however, objected that this might meet the letter of the law, but violate the spirit of its intention—namely, that American taxpayers not be forced to participate in what for many is a morally troubling form of research.

During the first seven to eight months of his first presidential term, President Bush deliberated long and hard about the stem-cell debate that was playing out in the American public domain, especially in political circles. What I've heard from people who talked to him during this period is that he took this issue very seriously and talked with a great many authorities and struggled very hard to understand how to go forward. On August 19, 2001, Bush announced an executive order that allowed the NIH to study existing embryonic stem cells, recognizing that we could not undo whatever moral violations may have been involved in their production and that some good might come from studying them. But at the same time, the order specified that no federal funding would be allowed for future embryo destructive procedures as a means of obtaining embryonic stem cells. This is where the issue stands today. The President, in issuing his executive order, was upholding what he considered to be both the letter and spirit of the Dickey Amendment, while sustaining the position that conformed to his own beliefs on this controversial subject.

Central to an understanding of this moral dilemma is an awareness of how the debate has historically played out in the U.S. Prior to the passing of the Dickey Amendment, our nation was engaged in a lengthy debate, which lasted almost 20 years, wherein for the first time, scientific advances in the area of IVF had forced the American public to face the question of whether or not it was a reasonable thing for a civilized society to conduct actual research on embryos that was destructive or potentially damaging to those embryos. Not only has this public debate been lengthy, it has also been politically divisive. What basically is the prevailing situation in the U.S. is that the research looks exciting, but we have a long tradition in this country of not supporting research that destroys human life.

There's also a global controversy about stem-cell research. A debate similar to the one in the U.S. is going on all over the world. It is not widely recognized that many nations disagree with this research and some have more encompassing constraints on it than the United States. In Germany, for example, it's illegal to use IVF embryos to create embryonic stem cell lines, even with private funds. The more pervasive concern is the procedure called therapeutic cloning or embryo cloning. Major industrial nations, including Canada, France, Germany, Italy, and Austria, have bans with criminal penalties for therapeutic cloning. The global concern mirrors that of the American public—that this procedure involves the direct creation and destruction of human embryos purely for the process of research, which most countries agree is morally wrong.

DF: *So the challenge, then, is to identify the means of accessing embryonic stems cells without potentially destroying human life. Is this correct?*

WH: Yes. The potential for destroying human life is the major objection. As I mentioned, there are other ethical objections. But when you get right down to it, the most important question is: Do we create human life specifically to use it for research purposes? This question also applies to the use of left-over embryos from IVF, which, by order of Congress in the Dickey Amendment, has always been a private clinical procedure that did not involve the American taxpayers. Therefore, to now use those embryos for taxpayer-funded research is to move our nation into a realm that Congress has, for ten years, said we shouldn't be in. Yet there has been movement in favor of liberalizing federal funding policy to allow research on additional stem-cell lines created using IVF embryos. Last summer, Congress tried to override President Bush's executive order to allow for the use of IVF embryos. That effort, however, was vetoed by the President. So we're in kind of a middle zone now. It remains to be seen where this issue will take us from a legislative perspective now that there is a shift in the control of Congress.

DF: *You have served on the President's Council of Bioethics since it's creation in 2002 and have been vocal about your belief that it is possible to resolve this highly charged ethical conflict. One such possibility involves a proposal for Altered Nuclear Transfer (ANT) that you authored for the President's Council in 2005. How is ANT different from standard nuclear transfer procedures?*

When President Bush announced his executive order on stem-cell research in 2002, he also established the President's Council on Bioethics to which I was appointed as a founding member. I would like to emphasize that we work on more issues than just embryonic stem cells; we've worked on a whole range of bioethical issues through the years. The work of the President's Council—past and present—is well chronicled on the Web site www.bioethics.gov. The proposal to which you refer is embedded in the white paper report entitled "Alternative Sources of Human Pluripotent Stem Cells," which was published by the President's Council in 2005. In the report, the Council examined four proposals for obtaining stem cells in a way that did not involve the direct destruction of human embryos. Given the detailed nature of each of the four proposals, I will limit my discussion here to the proposal for Altered Nuclear Transfer. The full white paper report is available for downloading on the President's Council for Bioethics Web site.

Let me begin by explaining that embryo cloning, therapeutic cloning, and somatic cell nuclear transfer (SCNT) are all words for a procedure that involves taking a human egg, removing the

nucleus of that egg, and replacing it with a nucleus of an adult body cell. (Reproductive cloning attempts to implant the embryo created by SCNT into a womb to make a baby.) A short review of high school biology would be helpful here. In natural fertilization, a sperm and an egg combine and each brings half the chromosomes (23 chromosomes) necessary to create a human organism. The adult body cells that are formed subsequently after every division of the single-celled embryo following initial fertilization carry 46 chromosomes. This means that every cell in a natural normal human body has 46 chromosomes.

When a scientist who is performing SCNT takes an egg and inserts the nucleus from an adult body cell directly into that egg, the nucleus already has 46 chromosomes; so the egg doesn't need to be further fertilized. By activating the egg with a chemical or a little bit of an electric charge, it begins (if all goes well) to divide like a normal embryo. What happens next is that the egg cytoplasm (the stuff inside the egg cell) reprograms the adult nucleus, taking it back from its differentiated, specialized state to an undifferentiated state that is characteristic of an early embryo. This process is analogous to taking an adult from her specialized job and putting her back into kindergarten again. She would then be able to start fresh and learn all the different tricks and trades that go into any other specialized job. In the case of the adult nucleus, it learns all that is required to form the different cells of the body.

So what are the chemicals that can trigger this reprogramming? That is a fascinating question. We don't exactly know. It may be very few chemicals or it may be quite a few. But we do know that this reprogramming does work in the human egg. We know that the egg contains what is necessary to bring an adult nucleus back to the state where it is capable of producing embryonic life because that is how Dolly the sheep was made. But it's very clear that you need exactly the right components in the cell for this to happen. First of all, not every act of nuclear transfer results in the effective production of embryos. Many don't grow at all, some of them die in the process of development, and even those that are born often show defects of development. So obviously this is a fragile process and it needs to be properly constituted. Scientists are also aware of this fragility by observing natural processes.

For example, we know from studies of natural fertilization that many of the products of natural fertilization never get off the starting blocks. They are like failures of fertilization in that they are improperly constituted. Additionally, we know that there is a kind of a tumor called a teratoma that develops in a woman's ovary. These are benign tumors. They seem to have their origin in the inappropriate activation of human eggs, and we know that they form all the cells, tissues and sometimes even partial organs of the body. The teratoma is like a bag of jumbled puzzle parts; it's tissues without order or organization. Neither medical science nor the religious traditions have ever considered this tumor to be an organism. The interesting aspect of the teratoma is that in order to produce all the cell types, it has to be able to produce the equivalent of embryonic stem cells, or, as they are called, pluripotent cells. A definition of the term "pluripotent" is helpful here.

In the President's Council report we use the term "pluripotent," "pluri," of course, meaning "plural." The way we are using this term is in contrast to "totipotent." To say a cell is totipotent means that it is able to make a whole organism; in other words, it is rightly considered an embryo. Pluripotent, on the other hand, means that the cell can produce all the specific cell types that have the capacity to become all the different cell types of the body but doesn't have the capacity to organize a coordinated, integrated developmental trajectory that produces a living organism. So embryonic stem cells are pluripotent, and embryos are totipotent. The reason we changed the term to pluripotent from embryonic is that we would get these cells from nonembryonic sources but they would be functionally the exact equivalent of embryonic stem cells.

While working on the President's Council, I began reflecting on the teratoma's ability to produce stem cells without forming an embryo and realized that if nature could do this, then perhaps we could, technologically, do the same thing. I'm not referring to creating teratomas but rather to creating something that has a similar nature in that it would not have the capacity to integrate as an organism and yet could produce embryonic-type stem cells (or pluripotent cells). So we began thinking about and discussing this more and realized that if we changed certain specific factors in the nucleus of the adult body cell before transferring it into the egg, we might be able essentially to delete a key component that is essential for the formation of an organism, so no embryo could be formed and therefore no embryo would be destroyed. It is important to note that this would not create a 'defective' embryo but rather a biological artifact that from its very beginning is not and can not ever be an embryo. As we looked into this possibility more, we identified some pretty good candidate genes, but it's important to understand that Altered Nuclear Transfer is a broad concept with many possible targets. Currently the focus is on the gene called Cdx2.

In summary, Altered Nuclear Transfer is a way to obtain embryonic-type stem cells or pluripotent cells. We can obtain these cells without the creation and destruction of a human embryo. The idea behind ANT is that we might use the procedure that is involved in embryo cloning, but delete an essential component from the genetic recipe such that the resulting biological entity cannot form an organism but forms instead a single-cell lineage that is capable of forming embryonic stem cells. This is a very realistic proposal because there is good science to back up the possibility of doing this. Such work was done by Rudolph Jaenisch at MIT in 2005. He silenced the specific gene, Cdx2 that is essential for knitting the organism together. It is sort of like taking the glue out of the model airplane kit. It meant that the single lineage of cells that forms the embryonic stem cells, or in this case, pluripotent stem cells, was able to form without the whole organism around it.

As recently as last month, the President's Council heard very positive testimony from a scientist named Hans Scholer from the Max Planck Institute in Muenster, Germany, which suggests that this can be done by silencing the gene essential for the organization of an embryo in the egg cytoplasm before the

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nucleus is transferred into it. Such a procedure preempts the formation of any embryo. Scholer reported that all you get is a single-lineage tissue culture. So you can see how ANT can resolve the ethical conflict of embryonic stem-cell research—it is a way of advancing scientific research without the creation and destruction of human life. This approach would meet the stringent guidelines to qualify for NIH funding.

DF: *You mentioned last month's meeting of the President's Council of Bioethics. What can you tell our readers about the meeting? What would you say was a high point of the meeting that was encouraging in the area of embryonic stem-cell research?*

WH: I would say the high point was that this very well-respected scientist told us that he thought there would be a way of obtaining eggs without super-ovulating women. So that would take care of that moral concern. He reported that he believes that somantic cell nuclear transfer, as a technology, could overcome the barriers that are currently impeding progress in that field and that it could also be used for Altered Nuclear Transfer in such a way that embryos are not created at all. He showed us the work with the technology that has been suggested for ANT. He is able, in mice, to obtain embryonic-type (i.e., pluripotent) stem-cell lines at a rate that is twice what he can get by sacrificing embryos. So not only is ANT more morally acceptable, but it may turn out to be more scientifically efficient. All of the President's Council meetings are public. Your readers can go online (www.bioethics.gov), click on transcripts, and retrieve transcripts of last week's meeting.

DF: *Given that we are a Christian institute for advanced studies, would you share your faith perspective on this issue with our readers?*

WH: As a practicing Christian, I draw my larger perspective on the meaning of human life and the meaning of all of existence partly through my faith. But frankly, my religion has not been fundamental in my forming my opinions on this subject, except in the broadest sense. Certainly, my sense that there are transcendent moral principles in the universe comes partly from my faith. But even people who don't have religious faith believe there is good and evil, or maybe they'd say good and bad. Every time I talk to people about these issues, they have ethical lines they would draw. Maybe they don't think the five-day embryo should be inviolable, but they almost always think that the life of a newborn child shouldn't be used for spare parts. It's amazing that everybody, basically, has moral boundaries. The questions are: Where are those moral boundaries and how does one arrive at them?

When we first began working on the cloning and stem cell issues in the President's Council, I struggled very hard to arrive at my own answers to these questions. Make no mistake, this is a difficult subject. But I examined all the arguments for why human life should be inviolable only at later stages. We all accept that it should be inviolable at some stage. When I examined this issue, I couldn't see any reason why it shouldn't be inviolable from its initiation into organismal existence, in other words, from natural fertilization to natural death. If we are going to create human life in the laboratory, I reasoned that we owe it the same respect that we would give to naturally created life. So after struggling with this very deeply, I arrived at my opinions based on scientific analysis and logical consistency. The scientific truth is that once fertilization is complete, there is a living human organism. I think that that human organism should be treated with the respect, the protection, and the nurture that we treat any other human organism. I don't see that at any special stage of development one can say that you have a human being but didn't have one before that. I don't think that's a religious argument; I think it's an argument based on the continuity of human life.

DF: *Let's shift focus to what you believe the general public ought to know about the issues related to embryonic stem-cell research and, more specifically, Altered Nuclear Transfer. What do you want our country's leaders and citizenry to hear?*

WH: I want everyone to hear that we have not put this proposal forward casually, we have thought very deeply about these issues. We have involved many, many moral philosophers, religious leaders, and top scientists in this discussion. We believe we have a scientifically feasible and morally reasonable way to proceed. Altered Nuclear Transfer is difficult to understand at first. It can seem very close to creating an embryo, but the process does not involve creating an embryo. When I reflect on why I am giving so much of my time and energy to the scientific inquiry of ANT, I realize that the answer takes me back to my faith. I'm doing this for the kingdom of God and for the sake of my civilization. That answer is plain to me. I think as a Christian I am basically called in life to be used up for the good. Jesus set the example that we are supposed to imitate, which is to give our lives to his kingdom—which is the kingdom of love, and the fullness of life—and that's what those of us working on the ANT project are trying to do. But there is so much misunderstanding, so much struggle, and so much at stake in this issue.

The misunderstandings surface because the questions at the core of the issue of stem-cell research are very hard questions. The average person doesn't relate easily to a tiny clump of cells in a dish unless he thoughtfully reflects on the fact that that is how he, too, started. It's an abstract reality, but it's still a reality. There are many arguments made that aim to limit the definition of human life. One such argument is that the tiny clump of cells is not like a human being. It's a human organism, but it's not a person. I certainly understand how a parent with a sick child in need of the promising interventions that stem-cell research might eventually produce could be drawn to see it this way. Such a person might argue: "Wait a minute, what's the value of a clump of tiny cells? It's nothing as valuable as my little child right here in front of me." I understand.

I understand because I have a handicapped child of my own. She suffered serious brain damage because of mistakes made at birth. And I also understand these realms because I am a physi-

cian who is well acquainted with human suffering. I want to come up with an answer, which is one of the reasons why I am working so hard on Altered Nuclear Transfer. I feel the medical and human imperative of finding cures. I just think that if we allow a precedent to be established to use human life at any stage to cure other lives, there are broader implications that could be potentially damaging to human civilization. I have never had a child die. I look at my children—I have seven little children of my own—and I would not want any of my children to get sick and die. And yet I know that I would be sorely tempted if I had a child with a disorder that I thought embryonic stem cells could cure.

If there are well-informed people in the general public, which Canyon Institute for Advanced Studies is trying to make sure is the case, then they will contribute greatly to democracy. And democracy is probably the one way that we can get both social consensus and proper decision making in this realm.

No doubt about it, these are hard, hard issues we are facing. And that's one of the troubles—all the weight of disorder, disease, and death is being put against some thing that seems like an abstract principle at first. So the person who has a sick child or a sick elderly parent wants there to be treatments, wants there to be interventions. So it's very easy for advertisers to run politicized initiatives by parading people who are sick. Nobody wants to stand in the way of sick people being made well. The truth is that there have always been ways to advance medical science and instead, as a society with a ten-trillion dollar economy, we spend vast sums of money on trivial matters. But, no matter how many people are sick and how much money we are willing to spend on medical interventions, we must remember that moral principles that protect and preserve basic human dignity are the essential foundation of medicine. We must never degrade the very humanity we are trying to heal.

DF: *So the average citizen has an even greater responsibility to become more knowledgeable about these issues that directly affect their loved ones and our society as a whole.*

WH: I believe that bioethics is not a profession, rather it's a conversation, and it's a conversation for the whole human family. If there are well-informed people in the general public, which Canyon Institute for Advanced Studies is trying to make sure is the case, then they will contribute greatly to democracy. And democracy is probably the one way that we can get both social consensus and proper decision making in this realm, but it sure is a struggle.

When I started with the President's Council, I decided, at the fundamental core of my being, that I was going to reexamine carefully, thoughtfully, and honorably all the arguments. I realized that we couldn't make decisions or policy recommendations based on private religious beliefs; we had to find publicly accessible reasoning. I just promised myself that I would always speak the truth in that dialogue. I have to speak plainly, so it's put me in conflict with certain people. First, some of my pro-life friends want to exaggerate the value of adult stem-cell research to the point where they can swamp out any need for embryonic stem-cell research. But I think that it is just dishonorable to do that because I know enough science to know that pluripotent stem cell research is at least worthy of inquiry. Second, other people want to make a big deal over the egg issue; and I do think it's a big deal, but I also think that we will eventually come up with ways to obtain eggs without endangering women. Third, a lot of people want to say that whatever we do we should never use nuclear transfer procedures—no cloning procedures. Well, obviously, I'm against reproductive cloning, but nuclear transfer is potentially a very useful technology and we should explore it. So I'm on the opposite side of the issue, strategically, from some of my pro-life colleagues. But I also am in opposition to many of my scientific colleagues on the use of embryos. So that puts me in the center of this issue.

DF: *Lastly, with your lecture coming up on January 18th, what can a person planning on being in your audience expect?*

I want people to come expecting to engage in a dialogue about one of the most fascinating and one of the most important issues in our current civilization. We are at a special moment in the great drama of the unfolding of human life and, indeed, of life itself. We are gaining control over the production of life and the instrumental use of life as a resource in the study of science and the curing of other lives. While it may yield immense therapeutic benefits, we might also end up altering the very nature of human existence. It's one of the most important transitions of understanding we will ever experience as biological beings. Each generation has its own exciting issues to contend with, and this is ours—one of our major issues right now. It draws us down into the very depths of how we know anything and how we assign moral worth to anything. And it also, most specifically, asks us: What is human life? Where does it come from? What is it for and at what stage does it hold value? These questions in turn draw us into the deepest realms of science and the most abstract realms of our metaphysics and religious beliefs. This is a global conversation, and, therefore, there are different traditions included in the dialogue. And it all adds up to a reflection on the meaning of how we can be at once both material and spiritual beings. And what a fascinating subject that is!

When I reflect on Christianity in the modern world, I am struck by how deep it goes, that it goes down to the very depth of what actually is in existence—what actually exists. It doesn't try to run away from reality or philosophize about it or pretend it's not there. It goes down deep. Jesus knew the whole story; he knew not just what was in men in terms of evil, but what was coming down on them, the suffering and struggle of life. It's his engagement with suffering, and his willing sacrifice, that revealed the fullness of the power of love to transcend any existing circumstances and to turn all things for the good. In this age of advancing biotechnology we are seeing wonderful possibilities for healing, but we also face grave dangers to human dignity. We need to keep in mind what C.S. Lewis said: we should answer all of our problems with more love, not less love.

DF: *Indeed, what a beautiful contemporary paraphrase of Romans 8:28 you have provided our readers: "In all things God works for the good of those who love him and have been called according to his purpose."*

Beyond the "Evolution vs. Creation" Debate

By Dr. Denis O. Lamoureux

Dr. Denis Lamoureux will be presenting as part of the Canyon Institute for Advanced Studies 2006-2007 Public Lecture Series on Thursday, February 22, 2007. Debra Fisher, Managing Editor of the Canyon Institute for Advanced Studies newsletter, recently spoke with Dr. Lamoureux about evolutionary creation, one of multiple views on the origin of the universe and life.

Dr, Lamoureux is an assistant professor of science and religion at St. Joseph's College in the University of Alberta. He holds three earned doctoral degrees: dentistry, theology, and biology. He has debated leading anti-evolutionists Philip Johnson, Michal Behe, and Jonathan Wells. With Johnson, he co-authored *Darwinism Defeated? The Johnson-Lamoureux Debate on Origins* (1999).

Debra Fisher: *You use the terminology "Evolutionary Creation" to describe a view of the origin of the universe and life itself. But these two words—evolution and creation—do not seem like they belong together. On first read, they seem contradictory. Can you explain for our readers how these two words can possibly be related?*

Denis Lamoureux: The first thing to point out is that I didn't coin the term "evolutionary creation." It's been around for about 100 years. I haven't been able to track down who really did coin it, but it seems to come out of Christian Reform circles. The second thing to note is that you are absolutely right—most people think that evolution has something to do with atheism and creation has something to do with creation in six days. Of course those are two positions, but there are more than just those two positions. But before we can begin a discussion about the various positions, we have to define the terminology.

I will begin by defining evolution the way scientists define it—just simply as a natural process. Whether God is behind the process or whether it's a matter of chance does not enter into the definition of the term "evolution" because those issues become part of a theological and philosophical discussion. Now when it comes to "creation," I'm going to let the theologians define it. As interested as theologians are in how God created, that's not the range of their scholarship. The doctrine of creation, as defined by a theologian, is simply the world around us as the result of a Creator. When putting the two words "evolution" and "creation" together in the term "evolutionary creation," people are a bit put back on their heels. The response I often get from my students and my lecture audiences is similar to yours: "What is this term? It doesn't make a lot of sense." I must admit, as both a theologian and a biologist, I like the term polemically and I like it rhetorically because it causes people to rethink the meaning of these two words. But it is important to stress that an evolutionary creationist, such as I am, is first and foremost a creationist. I believe in a Creator, and that's a nonnegotiable tenet in my religious beliefs. Evolution is simply the way God created. In the same way that we might think of ourselves as being developed or created in our mothers' wombs through embryological processes, evolutionary processes are God's ordained and sustained processes. All science is doing is describing that process at a natural level.

I would like to follow here with one little caveat. The term "theistic evolution" is sometimes used to describe the position of evolutionary creation. Although it can be used as such, the problem is that the term is an inversion in order. It is important to remember that the noun is always the most important term in a category. I'm not comfortable with emphasizing the word "evolution," which is a scientific theory, over the word "theistic," which refers to God—in particular, a personal God. So that's why I'm opposed to the use of the term and I don't call myself a theistic evolutionist. I'm reminded of the meaning of the word "theist," which, of course, comes from the Greek word for God—*theos*. This word carries so many nuances. Some people will reduce the meaning of the words "theist," "*theos*" or "God" to refer simply to beauty in the world, such as Einstein did. When I, however, use these words I am referring to the God I worship who is specifically the God of the Bible. I stay away from the term "theistic evolution" so as to avoid any confusion.

DF: *I've reviewed your materials available on the Web site of St. Joseph's College at the University of Alberta, www.ualberta.ca/~dlamoure, specifically the table titled "Views on the Origin of the Universe and Life." I was surprised to discover a spectrum, so to speak, of perspectives on the issue of origins. Personally, I have been conditioned to think that it's either an evolution perspective or it's a creation perspective. It's one or the other. Yet your table shows that there are five different views* [Editor note: table is included on page 15 of this newsletter].

DL: Well, you're hitting it spot on. Regardless of the position that I embrace—evolutionary creation—if my work does the following (and in many ways this is all I hope it does): if it helps people move out of the dichotomy of the simple two-position model (either evolution or creation), then I am well pleased. In the table, I outline five basic positions just to show that there are more than two perspectives. I use this table in the classroom. I find that when my students get exposed to the five basic views, then some of them, in fact many of them, actually mix and match different components of the five to identify other views on the origin of the universe and life. So your use of the term "spectrum" is an accurate description because there are far more than these basic five perspectives, or positions.

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There is a spectrum of positions and combinations, but I think the most important thing is to help people step away from that black-and-white, either-or dichotomy. Introducing the five basic positions is a nice way of initiating movement toward a broader understanding. And as I tell my students, if you master the five positions, then you can begin putting together the pieces in different ways in order to understand from where other people are coming. So you've hit it spot on.

DF: *You brought up a good point because I wasn't just thinking only about my own view on the issue of origins when I examined your table. My mind opened up to think about many other groups of people. I must be honest about my ability, or lack of ability, to engage people in a discussion on the origin of the universe and life itself. I don't feel I have the knowledge or the tools to talk intelligibly about this critical issue; yet it comes up more and more in conversations these days. There seems to be such an openness, a curiosity, about spiritual matters and how life came to be. This is a trendy topic in many places where it was taboo before. I try to listen to people who have different ways of thinking about things than I do, but I can't quite get a handle on what it is that they think. As such, I am hesitant to join in the discussion.*

DL: I understand your hesitancy. Most people, like you and me, have been socially conditioned into the dichotomy of evolution or creation. And to make the first move out of a dichotomy, especially when you've been socially conditioned, is going to be a little tough at first. This is why I encourage people to start by becoming familiar with the handful of five basic positions instead of trying to understand hundreds of different positions, which is way too much for any mind to absorb in one step.

DF: *Getting back to the personal application of the table, I found it caused me to reflect on my own development as an adult learner. Here I want to share a parallel experience. When I was first exposed, as a college student, to the different perspectives on how people learn—cognitively, emotionally, and spiritually—I was able to find my place in the learning spectrum. For example, I discovered that as an introvert who is a strong visual learner, I prefer to work directly with texts in quiet solitude, whereas some of my peers who are extraverted auditory learners prefer to engage in group discussions as a way of integrating knowledge into their experiences. When I was given the knowledge and tools to explore my own unique learning style, I was able to look at the different ways of learning and analyze my preferences in comparison to others' preferences. This sounds like a lot of work, but it was an important process that helped me question my assumptions (many of which were the result of social conditioning like you described) and get right to the bottom of what I really thought about issues. Your table had the same effect on me. When I compared the components of the five different positions, I thought, "Yeah, this is it—this is how I see it;" and "Oh, so this is where such-and-such person is coming from!"*

DL: Again, you hit it spot on! My students tell me that the table is an effective tool for examining their own personal perspectives as well as those of other people.

DF: *Now that's all well and fine within the confines of the college classroom, but because discussions of the origin of the universe and life itself can be confusing and emotionally charged, oftentimes Christians in the real world avoid these discussions altogether. We prefer to not think about that which we don't understand. It is easier to claim that we are resting in the "peace that surpasses all understanding" or choose to trust the authorities—you know, the pastors and seminary professors—and let them tell us what to think and what not to think, for that matter. Why is it important for the average Christian to think about these things? Isn't faith in God enough?*

DL: Well, average Christians, if they're honest with themselves, ask these questions about how God created the universe, how God created them, and how they relate to God in his creation. Because we ask these questions, then I think we have to wrestle with them. But I'll take it one step further, and here's my evangelicalism showing, the average non-Christian also asks these same questions, although he may frame them differently. Therefore, as a Christian, I want to be equipped to be able to answer the questions properly and effectively so I can share the gospel. Am I suggesting that this ought to be an aspect of a person's defense of faith? You know, think about what Scripture has to say, specifically 1 Peter 3:15: "Always be prepared to give an answer to everyone who asks you to give the reason for the hope that you have." This is one reason why I think the average Christian needs to know something about evolution and creation. And I might add: the evolutionary evidence is mounting. Those who teach evolution are now acknowledging that they've done a very poor job of presenting the topic in schools and in colleges; but this is changing. So what I'm saying is that reasons for believing in evolutionary processes will increase because the topic is being more effectively presented—not only in the classroom but in mainstream public spaces. And because this discussion is out there, we, as Christians, have to deal with it. The question is: how effectively will we do that?

DF: *You are sure right about the discussions being out there in the mainstream of life. The issues of evolution and creation are really out there since the introduction of Intelligent Design theory.*

DL: Yes, and we must deal with the issues that are surfacing in these public conversations. I want to talk more about how Intelligent Design theory relates to evolutionary creation, but let's bookmark the issue for the moment.

DF: *Okay, so I'm going to be that average Christian and respond to your previous comments: "Wait a minute here! You are evoking 1 Peter 3:15. In essence, you're telling me that it's not enough to rest in the peace that surpasses all understanding. Now, if I understand you correctly, this means that I may have to go outside of my comfort zone, and I know this is not going to feel good! So before I will venture forth into unknown territory, I want to hear from you about your experiences because I have some fears about what might happen if I decide to think about these things." Dr. Lamoureux, I want to turn the*

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lens on your life for a minute. You have written in your newest manuscript: "Arriving at the belief that the Lord employed evolution as His creative method is not only challenging, but it also takes time…coming to terms with evolution is a gradual process that involves struggles with many issues. At times it is not comfortable. But most importantly, it is done on our knees in prayerful refection." Would you share with our readers one such time in your own struggle with the issue of origins when you were on your knees in prayerful reflection?

DL: In my personal voyage, it was a slow process. Yet there was that proverbial straw-that-broke-the camel's-back moment. I was in my third year of studies at Regent College. I remember the day like it was yesterday. After wrestling with this issue for three years, I was heading in the direction away from my young-earth creationist belief. I remember the moment when a profound shift in my thinking took place. I was reflecting on the Scripture, specifically the second verse of the Bible, while I was working on a paper. In that moment it became very clear to me that I couldn't be a young-earth creationist. I was reading Genesis 1:2, which describes a watery earth already in place, but there is no mention when it got created. So it hit me: if you don't know when it got created, you can't date it. And dating the earth is a key issue for a young-earth creationist. I recall how that simple realization shook my foundations. It was a dark moment. I was thinking about how I had left a lucrative career to become a creation scientist, and here I was reading Scripture that was bringing an end to this dream—to this vision that I had wrapped my life around. I thought I had completely wasted three years of my life! No doubt about it—this was a very dark moment for me. And then, all of a sudden, I stopped because there was a sense of the Spirit's presence. It was a sense of, "Listen, I called you to be faithful. I called you to come to this school. I called you to work hard. I'll take care of your education." And it was in that moment that I made another deeper commitment to the Scripture: "I will commit myself to the Scripture and go wherever the Scripture leads me."

This shift in perspective just wouldn't have been possible without the prodding and the leading of the Holy Spirit. In the midst of that moment of total darkness, I was ready to leave my books, my education, and my clothes behind in my apartment. I wanted to get into my car and drive home to Edmonton. I had just about everything in place for two masters' degrees, except this very paper I was writing when the realization hit me that I could no longer be a young-earth creationist. I remember thinking that I wouldn't even go to my graduation ceremony. I was out of there!

Yet when I reflect back on that dark moment, I realize that it was just another moment, in the midst of scary times, when I felt the Holy Spirit wrap his arms around me. And let me add: the more experiences we have like that and the longer we walk with the Lord, when we get in those dark corners, we start realizing, "I've been here before! Done that! You know, I've got that t-shirt!" And so when we come to the next dark corner, we trust a little bit more that the Lord will come through.

DF: *As you were describing that moment when you were ready to walk away from—not necessarily your faith—but Regent College and your education, I was thinking about the term "crisis of belief." Most evangelical Christians are familiar with this term, but you didn't describe that necessarily. From your telling of the story, it seems that your faith was intact.*

DL: I'm glad you're pointing that out. I need to qualify further the experience. As I recall, the moment of darkness lasted maybe 15, 20, or 25 seconds, but there is no doubt about it—this was a time of total darkness. This wasn't just about the dismantling of my dream—my sense of calling to young-earth creationism; I was, momentarily, questioning my faith. Intuitively, I was also beginning to realize that my view of origins was conflated to the Cross. I had nailed my human perspective to the Cross as if one more spike would make the difference.

DF: *But you know, I think about how we sometimes try to keep things so distilled in the church. Because of this, we can tend to think of people who have crisis of belief moments as people who don't have enough faith. But crisis of belief moments are breakthroughs!*

DL: Crisis of belief moments are wonderful! Look at the word "Israel," which is comprised of two words "*shara*" and "*El*." Israel is more than just a country like the United States. Israel means "struggle with God." It was first coined with Jacob. You know the story from Genesis: Jacob wrestles with the angel of the Lord who, after the scuffle, tells Jacob, "Your name will no longer be Jacob, but Israel, because you have struggled with God and with men and have overcome" (Gen. 32: 28). It's a tremendous story! These struggles aren't comfortable. Yet there is this funny tension—we don't want pain, but do we ever gain things from pain and struggle.

I want to further qualify this brief period of darkness that I experienced that day at Regent College. It was only a matter of seconds, but in those moments I was ready to walk away from everything. In those seconds, I remember thinking "I don't care! I just want to go back home." I didn't even know what I was going to do other than to go home to my mum and dad in Edmonton. Then all of a sudden, this reality that I'd been experiencing shifted. My thoughts came back to what I believe about Jesus. I talk to Jesus everyday. I trust Jesus everyday. I've found that people who really have that personal relationship are not threatened much by my view of origins. They seem to have this attitude of "Well, all that doesn't matter because it doesn't change what I'm experiencing right now in my relationship with Jesus." It was like that for me in the moment following the darkness. Coming back to the relationship with Jesus helped me regain my perspective.

DF: *Because you remembered previous Jacob experiences.*

DL: Jacob experiences, Jonah experiences, and even some Ho-

sea experience. All these experiences contribute to the development and growth of our faith perspective, but the point I want to make here is that this process—this wrestling with God and with one another—must be done in a faith community. You've got to have people around you who share your faith perspective and who are willing to explore God's word together. Coming back to my students at St. Joseph's College, there are people around them to encourage them in their faith and to challenge them in their thinking. I think adult learners—and we are all learners—should be doing this in the context of the community of believers. One of the things we've done with evangelicalism, and it's a very good thing, is that we have become very individualistic. We like to focus on our uniquely personal relationships with Jesus, but we've tended to go too much in that direction and failed to respect the authorities, like college professors, pastors, and other lay leaders with formal backgrounds in either theology or science. When we send our young people off to college, for example, we fear they will be exposed to evolutionary biology and lose their faith. No, they won't lose their faith, but what they may lose, and there is a good chance of losing, is a literalistic hermeneutic in their anti-evolutionism, which I might add is not a tenet of the faith. Such is true in our churches; we sometimes are afraid that if we expose people to other perspectives that they, too, will lose their faith. Such is not likely to happen in a community of believers who are wrestling with God and one another together in order that they might, like Jacob, experience the greater blessings that God wants to bestow upon them and their children, and their children's children.

DF: *I recently reread an account of how Billy Graham seemingly wrestled with the issue of evolution and creation. In transcripts of interviews with David Frost dating back to 1964, I read Graham's explanation of his own position: "The Bible is not a book of science. The Bible is a book of redemption, and of course, I accept the Creation story. I believe that God did create the universe. I believe He created man, and whether it came by an evolutionary process and at a certain point He took this person or this being and made him a living soul or not, does not change the fact that God did create man." Graham's words here allude to what you call the "two books model" relationship between Scripture and science. What do you mean by this?*

DL: The two books model has been around in church history for a long time. Someone who really popularized it was Sir Frances Bacon, who, of course, was one of the pillars of the scientific method. Bacon was the one who effectively coined the notion of induction. The Baconian model impacted a whole generation after the 17th century. In fact, Bacon's famous quote about the two books, which comes out of his *Advancement of Learning* (1605), is one of the epigraphs in Charles Darwin's *Origin of Species* (1859): "Let no man or woman, out of conceit or laziness, think or believe that anyone can search too far or be too well informed in the Book of God's Words or the Book of God's Works: religion or science. Instead, let everyone endlessly improve their understanding of both."

Galileo effectively parroted the two-books model; Pope John Paul II embraced the model; and I live by the model. But there's a little twist. There's really two ways of looking at this model. One is to say that Scripture actually gives us scientific facts and then we have to go to nature and see how the facts align. This is the manner in which a lot of modern evangelicals interpret the two-books model. But the way I approach the model, and I think Graham is doing this, is to go to Scripture to get the spiritual tenets, in other words the message of faith, go next to nature to find out what nature reveals, and then integrate the two. So when you think of the term "evolutionary creation," the notion of creation is a theological notion and so I'm going to Scripture to get those truths—particularly those related to the Father, Son, and Holy Spirit, who is the Creator—and then I'm going to nature to observe that the method of creation is an evolutionary method—it's through natural processes. So I'm a two-books man in that sense.

DF: *So how do you, as an evolutionary creationist, reconcile the two books of religion and science in your faith perspective? Specifically, can you provide our readers with an overview of the distinct features of evolutionary creation?*

DL: First of all, an evolutionary creationist believes in a personal Creator *and* the evolution of the world. Drawing from my own life, I will describe aspects of my personal relationship with the Creator. I interact with God everyday. I talk to God everyday. I am a charismatic Christian. I've got a Pentecostal bent in my experience. I've experienced signs and wonders, and in some cases, some pretty dramatic signs and wonders. However, when it comes to those really dramatic experiential moments, I find that God intervenes more selectively. Do I experience a lot of those subtle, subtle coincidences? That's where most of my divine action occurs. It is in these particular subtle coincidences where I really get a sense of the divine, which is why reading the Scripture every day is so very important. I'm convinced that no one would forget to eat during the day; you've got to eat. Reading the Scripture is when I get convicted of my sin and sense the Holy Spirit saying, "This is what you do in this situation." My sense of calling also comes through Scripture in terms of the Holy Spirit saying, "This is where I want you to go and what I want you to do." The subtle coincidences are part of the very personal dynamic side of the relationship—this side is the walk with God.

DF: *So you're saying there are two different types of divine action—that there are dramatic and subtle aspects of God's movement in our lives. Is this correct?*

DL: Yes, you've got it. The first I call "interventionism" and the other one I call "providentialism."

DF: *As I listen to you describe these two types of divine action, I'm thinking about how this connects with my own personal life—my physical self, my thinking self, my emotional self, and my spiritual self. When I look at each of those aspects of my being, I realize that, most often, my experiences of God's activity in my life are more of a subtle nature. And oftentimes, if I'm not attentive, I miss them. I'm not just talking about spiritual experiences. For example, when reflecting on my physical being, I cannot see myself changing subtly, not only day by day, but moment by moment. Someone brings out a photo album and I*

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look at how I once styled my hair, the clothes I once wore, and overall, how much my physical appearance has changed. And I think, "Wow, I've sure gone through a lot of change since then!" And then there are other times and ways that I notice subtle changes. I turn the pages of my Bible and read dated notes made in years gone by and I think, "Oh my, I was here before! Look at what I was thinking then compared to what I think now!" Isn't that process? Isn't that evolutionary?

DL: You want to be careful here. I caution you to watch that word "process." I go out of my way not to use it because I don't want to be confused with process theologians, whose views I adamantly oppose. In my assessment, process theologians have actually gutted the Christian faith. You are right in the sense that there is a spiritual evolution going on in your life. But I'm also cautious about using the word "evolution" because it is so quickly misunderstood. Yet your description is really quite accurate. When I teach on theodicy (in other words, God's goodness and justice in the presence of evil), people have a lot of trouble with the notion of natural selection and survival of the fittest. But do you know what this faith of ours is about? It is about the survival of the spiritually fittest. Isn't there spiritual selection? Well, no matter how you want to picture it, whether with fire or without, the Bible tells us that there is a hell. What is playing out in nature is actually happening spiritually.

DF: *So when you say that an evolutionary creationist believes in a personal Creator and the evolution of the world, I only have to look to my own development—the evolving of my own life that is taking place physically, emotionally, spiritually—to know what you are talking about.*

DL: You got it! And so it is a dynamic and growing process. Let's go back to theodicy—God's goodness and justice in the presence of evil. At the start of the book of James, we are instructed: "Consider it pure joy, my brothers, whenever you face trials of many kinds, because you know that the testing of your faith develops perseverance. Perseverance must finish its work so that you may be mature and complete, not lacking anything."

DF: *What is another feature of evolutionary creation?*

DL: The second feature of an evolutionary creationist's view is that she upholds the foundational principles of conservative Christianity and modern science. I first want to address the conservative principles of modern science. Science only deals with natural processes. If you write a scientific paper and include in that paper dysteleological nuances (those related to the belief that the world has no plan or purpose) or you quote Richard Dawkins and bring in overlays of atheism, that paper will be rejected immediately. When I talk about conservative scientific practice, I am referencing natural processes and we are not going to talk about the metaphysics—the philosophical or theological implications of the natural processes. So the conservative principles of modern science are easy to address. However, addressing the principles of conservative Christianity can be more complex.

The next question people pose in their minds when I introduce that I am going to talk about conservative Christianity is: How about this Denis Lamoureux—is he a conservative or a liberal? It is at this point that I pose questions to the audience: What's a liberal? Are we going to define a liberal by our science? And if they say "yes," then I begin with a discussion of astronomy; I do a quick review of the first three-quarters of Church history, right up to the 17th century. I remind them of the conservative Christian position with regards to the earth—that it was in the center of the universe and did not move. St. Augustine, the great St. Augustine believed that. Martin Luther believed that. And it was only through the works of Copernicus and Galileo that this perspective changed. In fact, in the frontispiece of Martin Luther's Bible (1534), is a picture of the earth as being in the center, a sphere called the heaven is all the way around the earth, the waters are above the sphere, and in the firmament are placed the stars, moon, and the sun. Now, no one in our modern-day holds that belief. Yet, are we going to look at our modern Christians and say that because they think the earth spins on its axis that they are liberals? I don't think anyone would accept that statement. But if they are going to let science define what's conservative, as in conserving the belief, then all modern 21st-century evangelicals are liberals.

DF: *I really like what you said about "conserving the belief."*

DL: That's what we mean by conservative. Now, here's where my concern is, anti-evolutionism has been welded into the cross, or conflated to the cross. We should leave the cross to be the cross—*to be the cross.* The only thing that happened on the cross is that Jesus died on it for our sins. That's what the cross is. Don't bring your politics into the cross; don't bring your health-and-wealth gospel into the cross; and don't bring your views that the earth is 6,000 years old into the cross because you're bringing stuff that shouldn't be brought into the cross. I was saved by the Blood of the Lamb, period. Nothing else.

The last feature of the evolutionary creation perspective is that it rejects the "God-of-the-Gaps."

DF: *I've heard this term before, but I'm not sure what is meant by "God-of-the-Gaps."*

DL: Let's go back to astronomy and think about the planets, the ones we can see. The early observers of the heavens referred to the planets as wandering stars because they did not move like the stars that were "fixed" to the firmament. From the perspective of those early observers, the planets were about the same luminosity of the stars, so it was reasonable to call them wandering stars. They noticed that the wandering stars moved from west to east, except they made these little loops that today we call "retrograde motion." Early astronomers, Christians in particular, wondered how this movement could happen so dramatically. Martin Luther is an example; he thought that this movement was such an amazing thing that

surely God had to do it. Other people suggested that this movement was the work of angels, but not Martin Luther. He was convinced that this motion was too much for mere angels to do. With the passing of time, human understanding changed from a geocentric universe to a heliocentric universe, in other words, from an earth-centered universe to a sun-centered universe. History tells us that this change in understanding was brought about by the work of Copernicus and Galileo. Over time, we realized that these little loops were due to our motion and the fact that the planets didn't move in this way. So this is what is called the "God-of-the-Gaps." Before Copernicus we didn't understand what was happening, so we attributed God to coming in and making this motion. Afterwards, we realized we were dealing with a gap in knowledge, not a gap in the continuum of nature in which God entered.

There are other examples of the God-in-the-Gaps phenomenon. As a matter of fact, there is a long history of people proposing mechanisms of divine dramatic intervention, and as time has gone on and science has discovered of what's really happening, the God-of-the-Gaps has been disappearing. The result is that there have been fewer and fewer gaps. Now this opens a great segue for talking about the Intelligent Design (ID) movement because the central tenet for the ID movement relates to another such gap. Scientists like my good friend Michael Behe (and Mike is my good friend; we just disagree) argue that the first cell had to be put together in "one cell swoop." When it comes to scientific knowledge of how cells went from molecules into cells, this continues to be a wide-open discussion and debate. Scientists don't fully understand it yet, and it will be while before we will even come close to understanding how this happens. The Intelligent Design movement, however, is suggesting that cells are, according to Mike's terms, "irreducibly complex," meaning that they couldn't come about by natural processes but that they had to be put together quickly and rapidly by the one cell swooper—God. Here's the question: Is this a *gap in knowledge* or is this truly a *gap in nature* in which God intervenes? Well, I'll answer this question historically. I think this is a gap in our knowledge and not God intervening in nature. As time goes on, we are going to find those natural processes that cause molecules to develop into cells.

The great danger of the God-of-the-Gaps perspective is that if you invest too much in your argument about the gaps and science ends up finding the natural processes, then what happens to your God? You lose your God. I think that the God I serve is a lot more amazing than a god who is tinkering along and adding missing pieces to nature, which is what is being proposed by the people who embrace God-of-the-Gaps models.

DF: *I want to bring this down to a very personal level. As I'm listening to your explanation of the God-of-the-Gaps model, I'm thinking about times in my own life when I have attributed circumstances in my life to God's intervention, times when I have explained, "This situation was beyond my human abilities so, surely God did it." And then time revealed that there were a series of happenings that took place in the natural unfolding of life that were not necessarily related to God's intervention. Right now, I'm reflecting on having become a believer later in life—in my 30s. I was such an enthusiastic new believer; I had it all figured out. And boy was I ever out there witnessing to the gospel, so to speak. Now having been a member of a Southern Baptist church, I knew how to witness to the faith. It was the job for which I was well trained. I would boldly report to people, "Oh, God did this in my life, and God did that." Later, I would learn that there were a series of happenings that were just naturally unfolding in my life. Reason could tell me that these occasions were not the divine actions that I previously thought. Not only did these realizations cause me to reconsider my own faith, they caused those people to whom I was witnessing to say, "Yeah, yeah, yeah, so much for your God." So on a very personal level, I know about the danger of which you speak.*

DL: Remember how we made the categorical differentiation between "interventionism" (dramatic divine action) and providentialism (subtle divine action)?

DF: Yes, I remember those descriptions.

DL: Well, we also need to make another categorical differentiation in divine action between the cosmological that occurs in nature—like the origins and operations of the world—and personal activity. "God-of-the-Gaps" is a term used exclusively for the cosmological, in other words, matters related to origins and operations. It is important to distinguish cosmological occurrences from the day-to-day personal providentialism or divine interventionism.

For example, when you first attributed personal occurrences to God and then later dismissed them as being caused by a series of naturally unfolding events, you may not have known at the time that God could have been working through those natural processes. So you can see how we have providentialism both in nature and providentialism in people's personal lives. You might look back on those early years later and recognize the divine action that eluded you when you rationalized about a natural unfolding of events. So I wouldn't be so quick to cross out the possibility of God working through circumstances and through people and through natural events to bring you to the point where you are today. Your early enthusiastic bold assertions might have been correct after all!

DF: *Last question here: How would you encourage Christians, persons of other faith perspectives, and those with no particular spiritual perspective to proceed in their own attempts to further define their thinking on these matters? Are there resources you would recommend?*

DL: If we're talking specifically about evolutionary creation, there is so little out there in the literature. The two best books so far are Keith Miller's *Perspectives on an Evolving Creation* and Darrel R. Falk's *Coming to Peace with Science: Bridging the Worlds between Faith and Biology*. There is a bit of a problem in that not many in evangelical colleges who are evolutionists are publishing their views, especially those who want to deal with human evolution. They really are not encouraged to publish in this area; and, quite frankly, they are very cautious to say anything because some have lost their jobs over this is-

(Continued on page 14)

Beyond the "Evolution vs. Creation" Debate

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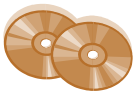
sue. I am grateful that this isn't my academic experience because I am an evangelical evolutionary creationist who teaches in a Catholic college. Evolution is just not a contentious issue for Catholics.

When I consider my calling, it truly is more pastoral than anything else. The core of the evolution and creation discussion is of a pastoral nature for me. But the discussion is an academic problem at its very base, which is why I pursued two doctoral degrees. In order to answer the questions about evolution and creation, I had to take my knowledge to the level of a Ph.D., which is a reasonable level at which to say that someone has a pretty good idea of the discipline. So I did theology at that level, and I did biology at that level. Then I came out on the other side and did a synthesis of the two disciplines. And the result of that synthesis is a manuscript for which I am seeking a publisher. This is a lengthy way of saying: I've got a book that is coming. Here's where my faith enters into the equation—I am praying that some evangelical publisher will have courage enough to publish a book aimed at the evangelical Christian who asks questions about the relationship between evolution and creation. After nine rejections, I am in a bit of one of those dark times. It is discouraging, but then I trust the Lord knows what He's doing…I've got the t-shirt!



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Views on the Origin of the Universe and Life

	Young Earth Creation	Progressive Creation	Evolutionary Creation	Deistic Evolution	Atheistic Evolution
Intelligent Design in the World	Yes Points to a Designer	Yes Points to a Designer	Yes Points to a Designer	Yes Points to a Designer	No Design an illusion
Age of the Universe	Young 10,000 years	Old 10-15 billion years	Old 10-15 billion years	Old 10-15 billion years	Old 10-15 billion years
Biological Evolution	Rejects macro-evolution Accepts micro-evolution	Rejects macro-evolution Accepts micro-evolution	Accepts macro-evolution Accepts micro-evolution	Accepts macro-evolution Accepts micro-evolution	Accepts macro-evolution Accepts micro-evolution
God's Activity in the Origin of the World	Direct (interventions over 6 days)	1. Direct for living organisms (interventions over billions of yrs) 2. Indirect for inanimate universe (ordained & sustained) naturalprocesses)	Indirect (ordained & sustained natural processes)	Indirect (ordained natural processes)	None (blind chance natural processes)
God's Activity in the Lives of People	Personal God Accepts miracles	Personal God Accepts miracles	Personal God Accepts miracles	Impersonal God Rejects miracles	No God Rejects miracles
Nature of the Bible	Word of God Inspired by the Holy Spirit	Word of God Inspired by the Holy Spirit	Word of God Inspired by the Holy Spirit	Rejects Bibical Revelation	Rejects Bibical Revelation
Interpretation of Genesis 1	Strict Literalism Creation days = 24 hr period	General Literalism Creation days = Geologic ages	Messages of Faith Ancient Science	Irrelevant Creation Myth	Irrelevant Creation Myth
Examples	Henry Morris, Duane Gish, Ken Ham	Hugh Ross	Keith Miller	Charles Darwin, Michael Denton	Richard Dawkins

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- Investigate and research issues emerging from new discoveries and advances—particularly those that redefine the boundaries of our knowledge and of its limits—to better understand their implications for us in the common ground of faith and discipline;
- Develop insights that lead to a more integrated view and understanding of the world around us, and of our stewardship of its emergent challenges;
- Disseminate information and perspectives to assist people of faith in the global community in developing sound, coherent, and informed foundations for engaging the exciting opportunities that lie before us.

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