Canyon Institute for Advanced Studies

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IN THIS ISSUE

"Does God So Love the Multiverse?"

An Interview with Dr. Don N. Page

Editor's Note: *This article includes portions of an interview Debra Fisher conducted with Dr. Don Page about the controversial multiverse theory. Dr. Page received his bachelor's degree in physics and mathematics from William Jewell College in Liberty, Missouri. He completed a Ph.D. in physics and astronomy in 1976 at the California Institute of Technology, under the supervision of Kip Thorne and Stephen Hawking. Page was a post-doctoral researcher under Hawking at the University of Cambridge in England 1976-79. He served as Professor of Physics at Penn State University before moving to the University of Alberta in Edmonton, Alberta, Canada where he presently holds the position of Professor of Physics.*

Debra Fisher: I would like to begin our discussion with your contribution to Bernard Carr's text *Universe or Multiverse* [Cambridge University Press, 2007]. In the chapter titled "Predictions and Tests of Multiverse Theories," you provided an overview of three common explanations for why the observed part of our universe seems fine tuned for life and us. Would you provide a brief overview of the three explanations and then share your thoughts as a quantum cosmologist and your thoughts as a Christian?

Don Page: There are many things about the universe that seem to be finely tuned for our kind of life. In physics particularly, we see what are often called "constants of physics." For instance, the ratio of the mass of the electron to the mass of the proton is one constant. The proton's mass is about 1,836 times the mass of the electron. There is also a quantity called the "fine structure constant" that defines how strongly the electrons and protons interact with the electromagnetic field; it's a small number, roughly 1 divided by 137. If both of these constants were varied by relatively small amounts, it would be very difficult to have complex structures, like complex molecules that seem to be necessary for life. There are, of course, many other constants of physics. It seems that for our existence, what we call "constants of nature" need to be arranged fairly close to what we observe. So the mystery is why this is the case.

So far, we don't really have an explanation for these constants of nature. One possible explanation is that a fine tuner, for example God, just chose the constants to be in this range so that life could exist, so that we could be here. A second possibility is that the arrangement of constants is coincidental. A number of physicists generally assume that perhaps there is some mathematical explanation for what these constants are and that they just happened to be suitable

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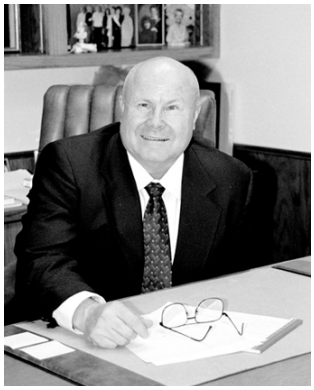
From the Director's Desk



In the final chapters of the book of Job, the writer challenges the reader, from God's point of view, to consider the observable and unobservable laws of both the earth and the universe. Physicists refer to those aspects of creation that seem to be finely tuned for human existence as "constants of physics" or "constants of nature." As physicist and cosmologist Don Page explains, "It seems that for our existence, what we call 'constants of nature' need to be arranged fairly close to what we observe. The mystery is why this is the case. So far, we don't really have an explanation for these constants of nature." Dr. Page describes three possible explanations: (a) the existence of a fine tuner, for example God, who chose the constants to be in a particular range in order to support life, (b) the arrangement of the constants is coincidental, and (c) the existence of a multiverse that has different parts with varying constants. The newest, and most controversial, of these possible explanations represents a leading-edge area of science—the multiverse theory.

There are numerous versions of the multiverse theory circulating. Given the theory's significance to both scientific thought and monotheistic religions, we have opted to devote this newsletter to a recent conversation with Dr. Page, Professor of Physics at University of Alberta. In addition to completing his Ph.D. in physics and astronomy at the California Institute of Technology under the supervision of Kip Thorne and Stephen Hawking, Dr. Page was a postdoctoral researcher under Hawking at the University of Cambridge in England from 1976-1979. This past summer, Managing Editor Debra Fisher traveled to Edmonton, Alberta, Canada to interview Dr. Page about his perspectives, as a quantum cosmologist and as a Christian, of the multiverse theory. Portions of that exclusive interview are presented in this newsletter.

On February 7th, we are pleased to be partnering with Paradise Valley Community College and the Phoenix Astronomical Society to host Dr. Page as he presents a lecture he first delivered this past October at Shandong University in Jinan, China as part of a John Templeton Foundation course. This will be the first time his lecture "Does God So Love the Multiverse", which explores the intersections between physics and religion, will be presented in the United States. I hope to see you at this special public education event and welcome your letters about our public learning offerings, including our newsletters and lectures.

Bill R. Williams
Director

Calendar of Events

February 7, 2008, 7 p.m.
Public Lecture: *Does God So Love the Multiverse?*
By Dr. Don N. Page,
Professor of Physics, University of Alberta, Canada
Paradise Valley Community College Library,
E-Building, Center Campus
18401 N. 32nd Street, Phoenix, AZ

Monotheistic religions such as Judaism and Christianity affirm that God loves all humans and created them in His image. However, we have learned from Darwin that we were not created separately from other life on earth. Some Christians opposed Darwinian evolution because it undercut certain design arguments for the existence of God. Today there is the growing idea that the fine-tuned constants of physics might be explained by a multiverse with very many different sets of constants of physics. Some Christians oppose the multiverse for similarly undercutting other design arguments for the existence of God. However, undercutting one argument does not disprove its conclusion. In this lecture, Dr. Page will argue that multiverse ideas, though not automatically a solution to the problems of physics, deserve serious consideration and are not in conflict with Christian theology.

Dr. Page will lead a question-and-answer session following his lecture and refreshments will be served. For more information on this free public lecture, contact Canyon Institute for Advanced Studies: (602) 252-4203, info@CanyonInstitute.org, or visit our Website: www.CanyonInstitute.org.

March 3-8, 2008
Extending Life: Setting the Agenda for the Ethics of Aging, Death, and Immortality
Grace Convention Center, Ahwatukee, Arizona

The Center for Bioethics and Human Dignity is presenting this conference that includes two pre-conference offerings: Intensive Bioethics Institute and Advanced Bioethics Institute. A wrap-around conference course can be taken in addition to an institute for academic credit. Registration and general conference information is available on the Center for Bioethics and Human Dignity Web site: http://www.cbhd.org/index.html.

Letters to the Editor and Calendar of Events

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.

Please submit information about upcoming events you would like included in future newsletters to the attention of Debra Fisher, Managing Editor at:

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for life. And yet a third idea, which has gained a lot of support recently but is also very controversial, is that the universe is so vast that there are many different parts that have different constants. In this third explanation, what we think of as constants are only constants for our part of the universe; and these constants may have different values elsewhere in other parts of the universe. Furthermore, if the range is suitable—if these constants have a huge range with many different parts—there may be parts of the universe that are suitable for life, even if not all parts are. So there are these three possible explanations—fine tuner, coincidence, and part of a multiverse. These possibilities are not necessarily mutually exclusive, but they are sometimes viewed as somewhat competitive.

Because these constants have certain values, Brandon Carter formulated the anthropic principle ["Large Number Coincidences and the Anthropic Principle in Cosmology" in M.S. Longair (Ed.), *Confrontation of Cosmological Theory with Observational Data*, Riedel, Dordrecht, 1974]. Carter noted that our place in the universe may not be completely random because it depends on where the conditions are suitable for our existence. For instance, most of us live and work within ten meters of the surface of the planet, and yet that represents only an extremely small fraction of the universe's space. So we are in a very unusual location if one just picked a random location in space in the universe. On the other hand, this location has conditions that are very good for life, whereas way out in empty space is not very good for life. Carter emphasized that one should take into account the conditions that are necessary for life because as living beings, we have to be where life is. Therefore, we couldn't exist where life is impossible. And it is less likely for us to exist where life is very difficult. So it's not surprising that we live within ten meters of a surface of a planet even though that is a very tiny fraction of space.

Now the idea of the anthropic principle has been expanded to consider that although we observe parts of the universe, we don't see these constants changing. I mean there's some tantalizing evidence that maybe the fine structure constant might have varied in the past, but it's by no means certain yet. The interpretation of the observations is a bit controversial. So, leaving that aside, there's no strong evidence that these constants change. In other words, as we look way out in space, it seems that the ratio of the mass of the electron to the mass of the proton is the same everywhere. And the fine structure constant, except for the controversial interpretation, seems to have been pretty much the same. And other constants having to do with the strength of the strong interactions seem to be more or less the same over time, so we don't see them varying. But there are now theories that suggest that the universe is far, far bigger than what we can see. In parts of the universe way beyond what we can see, maybe the constants are different.

After Brandon Carter formulated the anthropic principle, people picked up on the idea that we can only be where life is permitted. Thereafter, the focus was on the fact that there are these constants that are fine tuned for life, and the search began for the explanation. A number of theists argued that the anthropic principle is evidence for God's fine tuning the universe, for God having selected the constants. And that might well be right, but of course a lot of scientists want to look for a more naturalistic explanation, which may or may not conflict with the theistic explanation (I will get more into that later).

One of the explanations that scientists have come up with is that the universe may be very vast. Quantum mechanics, for example, predicts probabilities for different possibilities to happen; however, it has always been mysterious as to what these probabilities mean and whether there really is a choice made between the different possibilities. Hugh Everett suggested an interpretation in which all the possibilities actually do occur, and this is often called the "Many Worlds" interpretation [*Many-Worlds Interpretation of Quantum Mechanics*, Princeton University Press, 1973]. Everett's interpretation would allow for a huge variety of universes. By itself, this interpretation doesn't imply that the constants have to change; it could be that there are just different possibilities with the same constants. Another idea is that of inflation, which holds that in the very early universe there was some inflaton field that caused the universe to expand exponentially so that it became very big—much, much bigger than what we see today.

Yet another naturalistic explanation is posed in the idea that there could be different phases of the universe, effectively different conditions that make it look as if the constants of physics are different. They would be different, except of course, if they differed, they wouldn't really be constants anymore; they would only be constants over a small part of the whole universe, such as over the part of the universe that we can see.

This idea that constants could vary has gained support in just the last few years from superstring theory. Scientists have found that there seems to be a huge number of different possible solutions for superstring theory, and they seem to correspond to different, what we might say, laws of physics, or what some theorists call bylaws of physics—that which we see in our part of the universe. Leonard Susskind has called this picture the "landscape" to describe this huge range of different possibilities in string theory, including different constants.

These ideas, and others, for solving the problem of why the constants are as they are, have surfaced somewhat independently. The initial reaction of many physicists has been that this is bad news because they would really like, they were hoping, that physics would actually predict precisely what the constants were. And then of course, I think it would be generally regarded a coincidence that it just turned out that the mathematical form of the equations of physics would dictate that the constants would have to have this form, but then it would just be coincidence that it happened to allow life.

The newer idea, which I say is still controversial, is that maybe these constants vary over the whole universe. And if they have enough variation, then there could be some range where life is permitted. So, in a sense because this idea is an

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alternative to saying God fine tuned it, then one might view it as being a little bit atheistic. In fact, Leonard Susskind has written an excellent book titled *The Cosmic Landscape* [Little, Brown, and Company, 2006]. Susskind doesn't focus much on the subtitle, *String Theory and the Illusion of Intelligent Design*, in the text, but the subtitle suggests that the apparent fine tuning of these constants may be just an illusion. It may be that there really is this vast multiverse with all these values.

As a Christian, I believe that God created the universe, or the multiverse, or whatever it is that's there. So it is not a question of whether God designed and created the whole thing, rather it's a question about the level of the design. It might be that God found it more elegant to create a vast multiverse, which in a rather paradoxical way could be simpler than just our part of the universe. The whole can often be simpler than the parts, just like the set of all positive integers—the natural numbers 1, 2, 3, 4, 5, 6, and so on up to infinity. That whole set is an idea that can be fairly easily grasped. Children learn in grade-school arithmetic the idea that there is no end to the natural numbers. The numbers go on forever, so the whole set of natural numbers is known as an infinite set. In some sense, the idea is fairly simple.

As a Christian, I believe that God created the universe, or the multiverse, or whatever it is that's there. So it is not a question of whether God designed and created the whole thing, rather it's a question about the level of design.

So in some sense, the whole can be simpler than the parts. For physicists, if they do accept the multiverse (as I said, it is a bit controversial whether one should or not), it would be because it would be regarded as a simpler picture of the whole universe than the simplest picture they could try to get of the part that we see, where the constants have the values we observe. Similarly, I do believe that God is a very elegant mathematician among other things, and so I do believe that it might be natural for him to try to create a universe as elegant as possible. If indeed the multiverse would be a very elegant way for God to create a universe that has beings like us that can be conscious and have an awareness of God and can have fellowship with God, then maybe God would have chosen to do it that way.

In that sense, I am not theologically opposed to the idea of a multiverse, though I will admit it would undercut some of the apologetics that people have used to say that if science has no other explanation for this fine tuning, and if it could be explained that God did it, then you might say that that might be an argument for the existence of God. So in some sense, the multiverse ideas undercut some of that apologetic. But of course, just simply showing that one argument for the existence of God isn't right or showing that it's not conclusive doesn't mean that the idea of theism is wrong; it just means that this particular argument has some weaknesses.

I think a somewhat parallel situation occurred before Darwin developed his idea of evolution by natural selection. People pointed to the remarkable properties of animals and plants on earth, which indeed are quite remarkable, and they postulated that God individually made each species, sort of like a separate creation, and put them all here on earth. Darwinian evolution, however, says that in some sense the whole system evolved, which gives a scientific explanation for creation. I believe that God did create the whole thing; He did create through an evolutionary process as Denis Lamoureux [University of Alberta] has argued and defended quite cogently.

So I don't believe that Darwinian evolution is an argument against God, but it is true that the discovery of the idea of evolution did undercut some apologetics that said that God exists because we see all of this marvelous detail in animals and this could only have been created by God. The implicit assumption here is that the marvelous details could only have been created as individual acts of God–that He made each individual thing through a separate creative act. I don't want to give the idea that evolution means that God didn't create all that we experience, because I do believe that He did.

DF: But what you are saying is that there is some parallel process here.

DP: Right, I am saying there seems to be a bit of a parallel between Darwinian evolution and the multiverse idea. Now of course we are in the very early developmental stages of the multiverse idea, and it could just turn out to be wrong; it could be that science will come up with a better explanation. So, I see that it seems somewhat parallel to maybe Darwinian evolution right after Darwin wrote the *Origin of the Species*, when the idea wasn't well confirmed.

My understanding of history is not too great, but there was this debate between Bishop Wilberforce and Thomas Huxley about Darwin's idea of evolution. Today, people often criticize Wilberforce for arguing against evolution, but at that stage, Darwin's idea really wasn't well confirmed. There were a lot of scientists who had their doubts about the theory, which is perfectly proper. The doubts must be raised in order to test a theory. So Wilberforce's doubts were reasonable at the time. While on one hand, there was a mixture of Christians who, like Wilberforce, didn't think the theory of evolution was right, there were, on the other hand, other Christians who did accept the idea at that time. Although there is still some controversy within the Christian community as to whether Darwinian evolution theory is correct, it does seem to me that it is certainly the best scientific explanation at the moment for how the species got here. I concur with Denis Lamoureux that I can say that I am an evolutionary creationist or, to use another term, a theistic evolutionist, who believes that God created the whole universe and created the universe such that if indeed this process is correct, which I think is likely to be, that He created the universe such that the species would evolve this way.

DF: Staying with your thoughts about the parallelism between early Darwinian evolution theory and current multiverse ideas,

I want to refer to something you said earlier in our conversation and your recent writings. Earlier in our interview, you explained that as a physicist, whenever there is talk about all these variations going with constants, such as is the case with superstring theory, you get a little bit uncomfortable. Yet, you have written that superstring theory is attractive because it seems to be the best current candidate for a dynamical theory of the universe. Furthermore, you explained that you have less confidence in superstring theory than you do in providence or in multiverse ideas. You further described how superstring theory is leading towards multiverse ideas. Can you explain these seeming contradictions that I am picking up? Is it that we are so much in the early phases of multiverse ideas that these are the questions going on in your mind—the conversation that is happening in your mind?

DP: Yes. It is important to understand that there are a number of multiverse ideas that can take on different forms. Let's suppose for the sake of argument that I now mean a multiverse big enough that what we think of as the constants of physics can vary. In essence, there are different places where the physics constants can be different. Now, that idea is not exactly the same as string or M theory. String or M theory is some specific theory for trying to explain elementary particles and gravity in a quantum context, and so far, it seems as if it's the best candidate for theory to incorporate gravity into the other things, though there is competition. There's loop quantum gravity and other approaches to quantum gravity that scientists are also pursuing. What has happened, basically, is that string theory has evolved in just the last few years. After a lot of scientists had the hope that it would produce particular constants of physics—that it would predict the constants we see—it now seems to suggest that it predicts a huge variety of sets of constants. I mean, the string landscape—sometimes called different string vacua—describe properties of different solutions of the equations of the theory.

DF: So this is stringscape?

DP: Yes. I used the word stringscape, although everybody uses the word landscape. I just thought for string theory, it made sense to call it the stringscape. So string theory has given a particular support for the multiverse, but the idea is older than that. John Wheeler had ideas that if the universe collapsed, then, instead of ending at a big crunch, maybe it would bounce and there would be a new phase of the universe. But he suggested that maybe the constants of physics would get reprocessed and that they would change. Wheeler's ideas, even at that stage, were essentially before string theory was very well developed. Wheeler had this idea far before string theory had advanced to the possibility of this landscape of different constants.

DF: I want to review a phrase you used that really describes where we are at with our thinking about multiverse—"there is a lack of observable evidence." You wrote that one of the major objections to the multiverse is that it is unobservable because "One cannot test scientifically a theory that makes predictions about what is unobservable." So why do you, as a quantum cosmologist, think that this is a viable area of study?

DP: If indeed by the multiverse you mean parts of the universe that have different constants of physics from the part we can observe, then you could say almost by definition that it is unobservable because it would describe parts that we do not observe. The parts that differ would be by definition unobservable because they are different from anything we observe. I think you are referring to my explanation that one can, however, test a theory that makes use of unobservable entities to explain and predict the observable ones.

DF: This explanation brings to mind a particular scripture verse—Hebrews 11:1. The writer of this book asks: What is faith? It is the confident assurance that what we hope for is going to happen; it is the evidence of things we cannot see.

DP: Yes. That's a good parallel. Although I didn't think of Hebrews 11 when I wrote that explanation, that is a good analogue.

The difference is that in science, we call it a theory. I suppose in theology, it is a theological picture of things, or a systematic theology. One can view Christian theism as an entire theological picture: God creates the whole universe and then sends His son Jesus Christ to earth to live as an example among us and then to suffer and die on the cross for our sins so that those who believe in Him can be forgiven and have eternal life with God in heaven. There are many parts of that picture that we here on earth, of course, don't have direct evidence for. We don't directly see heaven; we don't directly see God the Father. Our ancestors have seen the human person Jesus Christ, whom in Christian theology we believe to be both man and God. Our ancestors saw Him working on earth; they saw His human form that reflected His divine nature. But of course, we don't directly see God the Father; we don't directly see heaven. We don't directly see a lot of other things, but one has to, in some sense, take the package as a whole and then determine what it does predict and whether one can test what it does predict.

One can see that there is much of what the Bible and Jesus said about human nature that certainly seems to be true. And then of course there's the fact that although logically the resurrection doesn't prove the existence of God, it is rather hard to imagine why the disciples would report Jesus's being resurrected and be willing to be put to death for this faith, of which the resurrection was a crucial thing, if it didn't happen.

For me, the strongest evidence for Christianity is essentially that there were these original people who claimed to have seen Jesus resurrected and that this claim was an essential aspect of their faith, and most of the original disciples were put to death for their faith. Millions of people have since been put to death for their Christian faith. Some people say that maybe they are just delusional. I don't believe that people who are willing to die for their faith in our present day are necessarily delusional, but I would agree that maybe the evidence is a little less strong with them than it is with the original eye witnesses because today's believers are not being put to death for a fact that they directly observed, at least for the resurrection. Now of course, we can have the evidence of God the Holy Spirit within us, and we can be willing to die for that. But, if you get to the historical question of the resurrection, then it seems that there was some-

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thing special about the first apostles that actually were with Jesus.

The fact that these early disciples were willing to be put to death because of reporting having seen Jesus resurrected is very strong evidence that they really did see Him resurrected. And then if Jesus was resurrected, that fits in with the prediction Jesus made before His death about the destruction of the temple and the building of another temple in three days. He was referring to His body that would be resurrected three days after His crucifixion. Jesus predicted this and claimed to be the Son of God. So it all fits together as a whole theological picture, even though someone might logically say Jesus wasn't the Son of God, while acknowledging His historical resurrection. Such an argument is conceivable, but it doesn't seem very plausible. So, in other words, if a person does not believe in Christian theism—that God sent his Son Jesus Christ to earth to live, to die, to be resurrected, to be seen by His apostles, and to ascend to heaven—one could argue that there is no direct evidence for all of that. But one still has to contend with the historical evidence for the resurrection. Since the resurrection is one of the predictions of the theory (Jesus predicted His own death and resurrection), if you call it a theory, evidence for the resurrection provides evidence of the theory, including the other unobservable parts. In this sense, I think the whole theological picture, as I described it, is similar to how scientific theory is developed.

Nearly a hundred years ago, there was a movement called positivism that advocated formulating everything in terms of observable concepts. But the movement turned out to be weak because it turns out we are very limited if we have to describe everything in terms of observable things. It's much easier to use unobservable entities to explain the observable. In science, you don't need all of the predictions of a theory to be observable. Now, if there aren't any observable predictions, then you don't really have observational evidence for the theory. But it seems to me that you could have some of the evidence be observable and yet the theory as a coherent whole predicts other unobservable things. This might turn out to be the case of the multiverse.

Since the resurrection is one of the predictions of the theory (Jesus predicted His own death and resurrection), if you call it a theory, evidence for the resurrection provides evidence of the theory, including the other unobservable parts. In this sense, I think the whole theological picture, as I described it, is similar to how scientific theory is developed.

I warn that there is no observational evidence that we didn't know of before developing string theory that string theory really explains. String theory has been developed to explain gravity, which we already knew about, and to give in a certain limit Einstein's theory of general relativity, which we already knew about. It has explained some properties of black holes, at least in certain cases the entropy of black holes, and the Hawking temperature for the very faint quantum emission of black holes. So as a theory, it seems to be successful in explaining some things that had already been known and were predicted. Many theorists think that that is evidence. Well, it is some evidence for the theory. But it would be nice if string theory could predict something new that hasn't been observed and if scientists could discover that the prediction is true. And so, I must admit that with string theory, we don't even really have that yet; so the theory isn't yet at that level of development.

DF: Are you optimistic that such a new prediction is possible?

DP: I'm optimistic that there's something worth investigating further. Now when I wrote that I had less confidence in string theory than I did in the multiverse, I was saying that string theory might be one theory that could lead to a multiverse. But string theory is rather controversial, although I would say that it does seem to be the best candidate that we have for a dynamical theory of everything—for explaining how things evolve in the universe, how things change from one moment in time to another, and how to connect gravity. It seems to be the best current candidate, but of course we don't know; it may just be a lack of imagination as to what other possibilities are out there. If I had to choose between string theory and any other current candidate, I would bet on string theory. On the other hand, I'm not sure I would say that I would assign more than 50% probability that this theory is right. It's not that I think there is some other current theory better than string theory, it's just that I'm a bit suspicious. I'm not at all confident that our imaginations have yet come upon the right theory. It might be. This is the optimistic view. I certainly think string theory should be pushed as hard as we can, but on the other hand, if people have other viable alternatives, then we should work on those as well. The trouble is that not any one of us has the mental abilities to solve this. I'm reminded of an e-mail message I wrote to Leonard Susskind in which I was raising questions about some problems with string theory. Leonard wrote back, "We're all babes in the woods."

DF: You wrote in some of your previous materials that the multiverse may be so large that there are very many copies of each of us with exactly the same genes and memories. Honestly, as a Christian, this idea makes me very uncomfortable. Scripture tells me that I am special because I am created in the image of God. Are you saying that, with all these duplications of genes and memories, I'm not special? I'm not unique? I'm not significant?

DP: I think there's a distinction between uniqueness and specialness. I will admit there is a tension here. A close colleague of mine, Alexander Vilenkin [*Many Worlds in One: The Search for Other Universes*, Hill & Wang, 2006] has, along with others, developed ideas about what is called "eternal inflation," in which there could be inflation that could make the

universe arbitrarily big. There might be parts of it that are bigger than any finite number you get, so it would be effectively infinite. One of the consequences of that infinite universe is that for anything that happens here, if you go far enough away, there is going to be a copy of it arbitrarily close or exactly like what happens here. I think Vilenkin did find this rather depressing because, in some sense, it seems we would lose our significance. But I'm not so sure that this possibility necessarily means that we're not special.

Suppose one argues that it is the uniqueness of one's genes that makes one special. Well that can't be right because identical twins are genetic copies, but that doesn't mean that each twin isn't significant. Now of course one could always say that because the twins are in different places that each has slightly different experiences. Even at the physical level, the experiences are recorded in the brain and the connections of the neurons and so on. And incidentally, there is far more information in the neural connections than in the genes, so in some sense, most of the information about us is in the neurons that record our experiences. There is a distinction between nature (genetic recordings) and nurture (experiences recorded in the brain). As far as the basic information, there is much more nurture—much more recorded in our brains than in our genes. But the genes might be more influential, because many genes may have influences throughout your life; whereas most of the experiences recorded in your brain may have more temporary influences (there continues to be a lot of debate about this).

So we've established that identical twins have at least the same genetic recordings. Now it can be postulated that if you go far enough in space, you can find another person, or a copy, with exactly the same brain recordings. The implication would be that we are not unique; there is some copy of us somewhere else. For example, the same experience (brain recording) may take place; of course it's a bit of a question as to if the experience is exactly the same. In other words, is the experience really a copy or is it just another person's experience? There are different ways to look at it. One way is to say that the difference could be that the surroundings might be different. It could be that all we know about is the same, but something we don't know about somewhere else in Edmonton or somewhere else in Phoenix is different. Another way to look at it is to say that there are two copies of a person, and in one copy somewhere in Phoenix the experience is one way and in the other copy of the person in the analogue of Phoenix the experience may be quite different. For example, one of the copies may be Paul Davies eating Wheaties for breakfast one morning in Phoenix, and in the other copy on the same morning in the analogue of Phoenix he ate Corn Flakes. So, one view is that there are two copies of a person and the surroundings are different—somewhere in Edmonton and somewhere in Phoenix. The other view is that there are the two copies of the person, for example Paul Davies, but it is uncertain what Paul Davies ate for breakfast this morning.

Even if we are not unique in our genetic recordings or our brain recordings, we could still be special. Here on earth, we all have different experiences and different memories. We all are in different situations; we have different roles with respect to other people. I think it is important for us to fulfill our individual roles, to show love to other people, and to be God's instruments here on earth. I can understand that it might be a little bit disturbing, psychologically, for you to think that there is a copy of you way off over there somewhere (either you who also exists way over there or a copy of you who exists over there). But I don't think it necessarily has to strike at the significance that you have.

Another parallel can be drawn from biblical history to help us understand the difference between our uniqueness and our specialness. According to biblical history, God first started revealing Himself mainly through the Jews—through the Jewish prophets and the Hebrew nation. He was revealing himself to the Jews—His special chosen people. But in some sense, their specialness, as I understand it, involved receiving and communicating God's word. The Jews weren't supposed to keep God's word to themselves; they were supposed to communicate it to others. This is one of the main points of the Old Testament historical narrative of Jonah.

God told Jonah to go preach to the citizens of Nineveh that they needed to repent from their evil ways, but Jonah didn't think the Ninevites deserved to be saved. Jonah thought that the Ninevites were so evil that they deserved God's condemnation, not God's salvation. Instead of obeying God, Jonah ran away. After being swallowed by a large sea animal, a reluctant Jonah finally turned around and preached the message of repentance to the Ninevites. The biblical narrative reported that the Ninevites, including the king, repented, and God showed his love and compassion by forgiving them—saving them from certain destruction. Jonah was so upset that he left and sat on the outskirts of Nineveh, waiting for the city to be destroyed. When Nineveh wasn't destroyed, Jonah was angry that God revealed His love and compassion to the Ninevites.

God correctly communicated to the Hebrews that they were special, but then it seems some of them got the erroneous idea that they were the only ones that were special. They thought there wasn't anybody else that was special, so in their thinking, the Ninevites weren't special. In some sense, it seems in the Bible that there is an enlargement of this idea of specialness. Particularly in the New Testament, it is communicated that the message of salvation did come first to the Hebrews, but it was extended outward so they weren't the only ones to receive the message. So it seems that in biblical revelation there's a feeling of the growth of who is special; it's not just the Jews, but others are also special.

Now these ideas are proposing a big leap: There may be multitudes of things—copies of us or similarities that are a bit different from us—that are equally special. This line of thinking, if it is correct, introduces a huge extension of what God has created, beyond what we can know. So if we think our specialness—or our significance—is based upon our uniqueness, then maybe this has to be rethought.

Public Lecture: "Does God So Love the Multiverse?"
February 7, 2008, 7 p.m.
Paradise Valley Community College Library

See page two of this newsletter for information on Dr. Page's upcoming free public lecture. For more information, contact Canyon Institute for Advanced Studies: (602) 252-4203, info@CanyonInstitute.org, or visit our Website: www.CanyonInstitute.org. A news release and map are available on Paradise Valley Community College's Website: www.paradisevalley.edu.

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