SCIENCE & RELIGION GUIDE

An exclusive, ongoing series to equip you with the tools to better understand the important issues at the crux of science-and-religion.

THIS ISSUE: INTELLIGENT DESIGN

When people sit down to discuss intelligent design

everyone seems to have a different definition for it. Is it political? Religious? Scientific? Is it about God or isn't it?

Depending on where you sit at the table, it's about all of these things.

Intelligent design as a theoretical concept provides a lens for seeing patterns and meaning in the world in which we live. Intelligent design as a scientific construct attempts to use science to show these patterns to be the work of a supernatural and intelligent designer — for all intents and purposes, God.

However, scientists, philosophers and theorists who use the phrase "intelligent design" don't use the "G"word — at least, not when they're describing science. Intelligent design proponents' staunch position on intelligent design-as-science is often in direct conflict with mainstream scientists' insistence that ID is religion masquerading as science.

Taking intelligent design out of the acrimonious debate, *Science & Theology News* takes a look at ID's concepts and presents counterpoints from scientists and theologians alike — without mudslinging or repetitive rhetoric.

The characters in this story know each other well. And even though privately (and sometimes publicly) these players might call each other scientifically ignorant biblical literalists or atheistic materialistic secular-minded elitists — everyone in the game knows that there's something to hear if the shouting would stop.

In this turf war, *Science & Theology News* provides a piece of Switzerland to let everyone come to the table, even if they'll still return to different countries and cultures after dinner.

ARTVILLE

Guest Editor: **Owen Gingerich**

Disrupting the design debate: Taking the ID debate out of pundits' playbooks

BY OWEN GINGERICH

Along with the vast majority of members of the Abrahamic faith traditions, I believe in a created cosmos.

Thus, I believe in an intelligent Creator and Designer of the universe. I have said that I therefore believe in intelligent design, lowercase "i" and "d." But I have trouble with Intelligent Design — uppercase "I" and "D" — a movement widely seen as anti-evolutionist.

I have come to appreciate that there is immense incomprehension from both the friends and foes of Intelligent Design. There seems to be a knee-jerk reaction among the critics that ID is simply creationism in disguise. It is unfortunate that our language is so easily hijacked that a perfectly reasonable word — creationism — now almost universally refers to belief in a 6,000-year-old young-earth sculpted by a worldwide Noachian flood. Even a passionate anti-evolutionist, Phillip Johnson, objected when I referred to him as a creationist. Intelligent Design is *not* young-earth creationism, and it is not necessarily opposed to many of the ideas of evolution.

I am sure that many friends of Intelligent Design would be dismayed and alarmed to hear this. They presume that ID is a bulwark against evolution, which they assume is atheistic to the core. They do not want to hear that *Homo sapiens* could have been on the family tree with an ape-like ancestor, despite the fossil record and the DNA lineages. Many of the supporters of the teaching of ID in public schools naturally expect that this would give credence to the literal story of Adam and Eve being directly created out of the dust — please, no story of intervening generations of single cells to amphibians, reptiles and mammals.

In a panel discussion at a meeting of the American Scientific Affiliation, Michael Behe, one of the architects of ID, declared that Intelligent Design is essentially theistic evolution. For many foes of evolution — and quite possibly for many advocates of evolution as well — theistic evolution seems like a contradiction of terms. Richard Dawkins, a triumphalist atheist, lauds materialistic evolution as making atheism intellectually respectable.

On the other hand, many eminent scientists, ranging from Theodosius Dobzhansky, one of the founders of the modern synthesis of evolution, to Francis Collins, the director of the Human Genome Project, have accepted evolution as the operational means by which the Creator brought the panoply of living forms into existence.

Essential to the theory of evolution is the hypothesis of common descent, the powerful idea that every creature had a parent. As a hypothesis, it is as reasonable as the notion that the Earth goes around the sun. But children are not clones of the parents, and perhaps not always even the same species, for there is the matter of mutations. Most mutations are disasters, but perhaps some inspired few are not. Can mutations be inspired? Here is the ideological watershed, the division between atheistic evolution and theistic evolution, and frankly it lies beyond science to prove the matter one way or the other. Science will not collapse if some practitioners are convinced that occasionally there has been creative input in the long chain of being.

The leading theorists of ID argue that the mechanisms of random mutations and natural selection are inadequate to account for the intricate and astonishing variety of life the world offers. Some would argue that the evidence for intelligent input is overwhelming. In terms of final causes, they make a good case for a coherent understanding of the nature of cosmos. But they fall short in providing any mechanisms for the efficient causes that primarily engage scientists in our age. ID does not explain the temporal or geographical distribution of species, or the intricate relationships of the DNA coding.

ID is interesting as a philosophical idea, but it does not replace the scientific explanations that evolution offers. But evolution presented as a materialistic philosophy is ideology, and that is something that can be legitimately resisted. Unfortunately, the battle as it is being fought is a battle of misunderstandings on both sides of the terrain. ✖

Owen Gingerich is professor emeritus of astronomy and history of science at Harvard University and a senior astronomer emeritus at the Smithsonian Astrophysical Observatory, Cambridge, Mass.

WHO'S WHO: Intelligent Design Proponents

Michael Behe

Position: professor of biochemistry at Lehigh University in West Bethlehem, Pa.

Contributions: He is author of ***Darwin's Black Box: The Biochemical Challenge to Evolution***. He is a senior fellow at the Discovery Institute's Center for Science and Culture.

William Dembski

Position: professor of theology and science at The Southern Baptist Theological Seminary in Louisville, Ky.

Contributions: He is author and/or editor of numerous books supporting the theory of intelligent design, including ***No Free Lunch: Why Specified Complexity Cannot Be Purchased Without Intelligence*** and ***Signs of Intelligence: Understanding Intelligent Design***. He is a senior fellow at the Discovery Institute's Center for Science and Culture.

Stephen Meyer

Position: senior fellow and program director of the Discovery Institute's Center for Science and Culture.

Contributions: Authored a paper on intelligent design published in the ***Proceedings of the Biological Society of Washington*** in August 2004.

Jay W. Richards

Position: senior fellow at the Discovery Institute's Center for Science and Culture.

Contributions: He is co-author of ***The Privileged Planet*** with astronomer Guillermo Gonzalez at Iowa State University. This book asserts that Earth is uniquely positioned in the universe for scientific discovery.

Jonathan Wells

Position: senior fellow at the Discovery Institute's Center for Science and Culture.
Contributions: He is the author of ***Icons of Evolution: Science or Myth? Why much of what we teach about evolution is wrong.***

'WHO'S WHO: INTELLIGENT DESIGN OPPONENTS' CONTINUES ON PAGE 41

Universal surprises

Intelligent Design helps open one astronomer's mind

Since he was six, Guillermo Gonzalez has looked up at the night sky, searching for more than what the universe could show him with his telescope. Gonzalez says the beauty of nature, as well as his Christian faith, have been in parallel orbits all of his life, rocketing him toward his career as an astronomer at Iowa State University.

In 1995, a solar eclipse he saw in India made him think about Earth's unique place in the universe — a place designed to be able to study such phenomenon. Though there was no "Eureka!" moment, Gonzalez felt strongly that chance couldn't explain Earth's privileged position. And last year, Gonzalez and Jay W. Richards, another fellow at Discovery Institute's Center for Science and Culture, published *The Privileged Planet*.

Currently, Gonzalez has been busy fighting intellectual battles on campus (See sidebar.) and continuing his own research on the Galactic Habitable Zone — the part of the galaxy that seems to have the right conditions to support life: conditions that all together, he says, are very rare.

Taking time out of his astrobiology studies and stepping out of the debate for a moment, Gonzalez talks about why he is an intelligent design astronomer and how that lets him travel in an unbounded universe.

What is your definition of intelligent design?

Intelligent design is the study and search for objective evidence of design in nature. It holds that certain features of nature are best explained by an intelligent cause.

When did you start thinking about intelligent design?

It's hard to pin a precise year on it. I gradually became interested in the idea of possible evidence of design in nature, in astronomy in particular. I was interested in reading about fine-tuning.

The fine-tuning argument basically is that the concept of physics requires being set within certain narrow ranges for the possibility of life in the universe. And so fine-tuning makes this a very low-probability universe.

And with the anthropic principle, you have to come to terms with that observation.

Basically there are two camps: One camp says that it's just an observer selection effect. And we've just selected this universe out of a vast ensemble of habitable universes. The other camp says that intelligent design is the best explanation, since we have no evidence for any such vast ensemble of universes.

How do use intelligent design in your research?

My argument that I wrote up with Jay Richards we presented in our book, *The Privileged Planet*; it's a completely original argument. We present the discovery that I made around the late '90s, where I noticed that those places in the universe that are most habitable for life also offer the best opportunities for scientific discovery. That seems completely unexplainable in terms of the usual naturalistic causes. So, intelligent design is the only alternative.

We actually drew that out a bit and further implied that the universe is designed for scientific discovery. So science is built into the fabric of the universe from the very beginning.

What is the most compelling example of design in the universe?

The first example I thought of was the solar eclipse. The conditions you need to produce a solar eclipse also make Earth a habitable planet.

The other one that really intrigues me is being able to detect microwave background radiation. Microwave background radiation is the leftover radiation from that early epoch when the universe was much hotter and denser. It was the deciding observation between the steady-state theory and the big-bang theory. Our ability to discover it and then measure it subsequently is very sensitive to our location in the galaxy, and also the time and history of the universe that we live in.

EVOLUTION OF IDEAS IN INTELLIGENT DESIGN

350 B.C.E.

Aristotle argues in ***Physics*** (II, 8) that there may be purpose present in nature, although we are ignorant of it. Theists of every stripe later cite the theory. Aristotle writes: "It is absurd to suppose that purpose is not present because we do not observe the agent deliberating."

1273

Thomas Aquinas completes his ***Summa Theologica***, incorporating Aristotle's concept of purpose into Christian theology, arguing that an understanding of purpose is an essential part of a full explanation for natural phenomena.

1759

Voltaire publishes ***Candide***, ridiculing the notion that there are divine purposes behind natural disasters like earthquakes.

1800

William Paley's ***Natural Theology*** is published. In it he proffers the existence of a Creator, using his now-famous allegory of finding a watch in the woods and distilling from that the existence of an intelligent, unseen watchmaker.

1859

Charles Darwin releases ***Origin of Species***, offering compelling explanations for how design can appear in nature without a designer.

1925

John Thomas Scopes is tried in Dayton, Tenn. for violating a state law banning the teaching of human evolution.

1961

Publication of ***The Genesis Flood*** by John C. Whitcomb, Jr., an Old Testament scholar, and Henry M. Morris, a civil engineer. It blends science and theology and gives birth to the idea known as "scientific creationism."

1986

Publication of Richard Dawkins's atheistic evolution best seller, ***The Blind Watchmaker***, takes direct aim at Paley's "watch implies watchmaker" argument.

1987

U. S. Supreme Court rules that laws requiring creationism in the classroom violate the First Amendment to the Constitution, requiring the separation of church and state.

What does using ID allow you to do that current scientific inquiry doesn't allow for?

I asked and continue to ask kinds of questions that a naturalist wouldn't ask. For example, if we were living on a different planet, or around a different star, or in a different place in the galaxy, how would things look different, and what kind of scientific progress would we have?

It's a perfectly reasonable set of questions — it's just a set of questions that hasn't occurred to anybody else to ask. I think it's because they haven't been open to the possibility of design, or getting an affirmative answer, which would point to design.

How would you construct a research program around this?

I could imagine having a student do a Ph.D. thesis asking the question: What is the best time in the history of the universe to be a cosmologist? They can modify that using the standard cosmological models. They can find out if we are, in fact, living at the best time, or if it's a distant time from now. It'll be interesting to find out the answer to that.

How does your faith affect your research?

I am a Christian. I've had a strong intuition from a very early age that there had to be something behind all this.

It makes me open to discovering the possibility of design, but I don't impose my faith on the data. I'm constantly reminding myself of my own personal biases so I don't inject them into research. But at the same time, I have a very open mind to seeing evidence that may not fit into the nice, neat categories provided by naturalism.

Why does science need the concept of intelligent design?

It's not something that *a priori* needs the concept of intelligent design. Here's something I stumbled upon and I discovered this pattern in the universe. It just screams out for another kind of explanation. It's not that I'm saying that the universe must display evidence of design, or I must be able to find something to fit that. I stumbled upon this and I can't explain it in the usual terms.

How does this alternate explanation of design in the universe lend itself to theology?

I'd like to try to keep my work in intelligent design separate from discussions of the implications of intelligent design. As an ID researcher, I know my limitations. You can say, "Okay, I think I've identified design in the universe, and here is the evidence." And that's it. I can't identify the designer uniquely.

If you want to partake into the theological discussion, let's bring in theological elements into it. Then it becomes broader than intelligent design.

I can imagine expanding this discussion, writing a second book just discussing the implications — bringing in aesthetics, philosophy and theology, which are less objective. But in our book, we wanted to keep the theology separate from the science.

Why do you need an intelligent design paradigm to explain the natural world?

As a scientist looking out at nature, I want to be open to possible evidence that a designer exists. If I say ahead of time, "Well, I'm not going to allow the universe to present objective evidence," then you're never going to be open to it. It's like the SETI [Search for Extra Terrestrial Intelligence] researchers who say, "The probability of life in the universe may be small, but if we don't look we'll never know."

At the beginning of the 20th century, virtually all scientists believed the universe was eternal. Then came the shock of the big-bang theory with the evidence of the expansion of the universe. They had to actually consider the possibility the universe had a beginning. So, the universe can surprise us. I would rather be more open to the possibility of being surprised.

Is this the suggestion you would give the scientific community about intelligent design?

Scientists, who may not even be design-friendly, may stumble upon design evidence, and I'm just hopeful that they're open-minded enough to just present it and admit that they stumbled upon it.

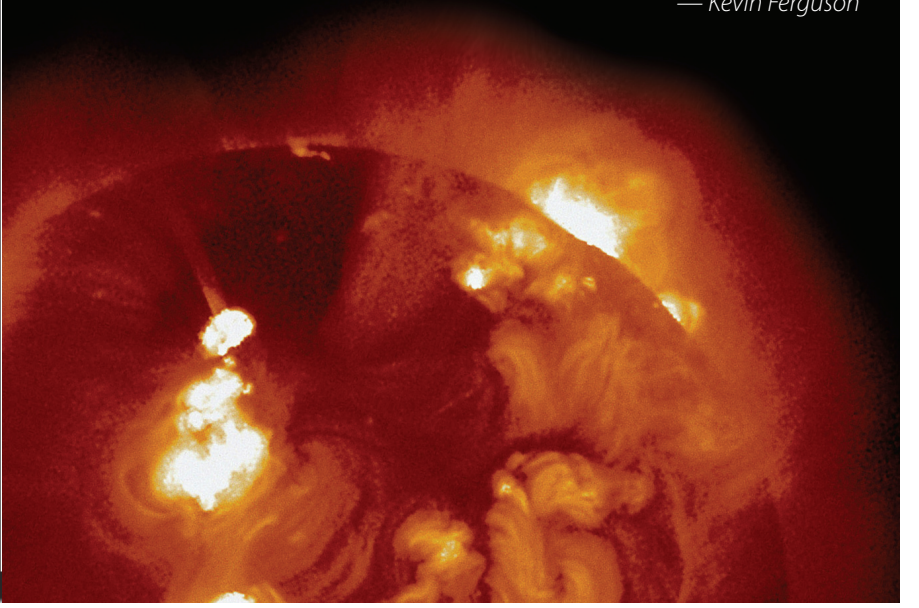
Gonzalez, Iowa State's wizard of ID, put on defensive

It could not have been an easy place for life to flourish: a superheated atmosphere in which the ground rapidly shifted and sulfuric material was incessantly spewed. Primordial Earth? Actually, it was Iowa State University in March 2004 as intelligent design proponents and their critics squared off following the publication of *The Privileged Planet* by Guillermo Gonzalez, an astronomy professor at Iowa State University, and Jay W. Richards, a former teaching fellow at Princeton Theological Seminary. Both are senior fellows at the Seattle-based Center for Science and Culture at the Discovery Institute, which supports ID research.

Gonzalez, a well-respected astronomer who has been feted by both NASA and the National Science Foundation, is in good company. His openness to — some would say promulgation of — intelligent design theory puts him in same camp as John D. Barrow, a research professor of mathematical sciences at the University of Cambridge, who said at a Templeton-Cambridge Journalism Fellowship seminar in June the extraordinary "fine-tuning" of the universe. Nonetheless, Gonzalez has managed to draw peer ire for discussing intelligent design theory. In fact, Gonzalez's stand impelled Hector Avalos, an associate professor of religious studies at Iowa State and faculty adviser to the ISU Atheist and Agnostic Society, to spearhead an anti-ID petition at Iowa State. More than 120 faculty members have signed it.

But Gonzalez's critics have got him – well, mostly – wrong, he said. "The statements use overheated rhetoric, such as labeling intelligent design as the 'new creationism,'" said Gonzalez. "They don't really try to engage intelligent design proponents. So, I see a particularly high level of intolerance for real discussion among leading scientific organizations."

— Kevin Ferguson



1989

Of Pandas and People: The Central Question of Biological Origins, by Percival Davis and Dean Kenyon, is published. The biology textbook promotes the idea of intelligent design.

1991

Darwin on Trial, by U.C. Berkeley law professor and born-again Christian Phillip E. Johnson is published. It becomes the handbook for the intelligent design movement, coining the term "intelligent design."

1996

Phillip E. Johnson becomes a founding adviser to the creation of the Discovery Institute's Center for Science and Culture.

1999

Mathematician and leading intelligent design theorist William Dembski is appointed head of Baylor University's Center for the Study of Intelligent Design.

2001

Johnson helps draft the Santorum Amendment to what later becomes the No Child Left Behind Act. The amendment, proposed by U.S. Sen. Rick Santorum (R-Pa.), promotes the teaching of intelligent design. The amendment is later stripped from the bill, although intelligent design proponents consider the effort a victory.

2004

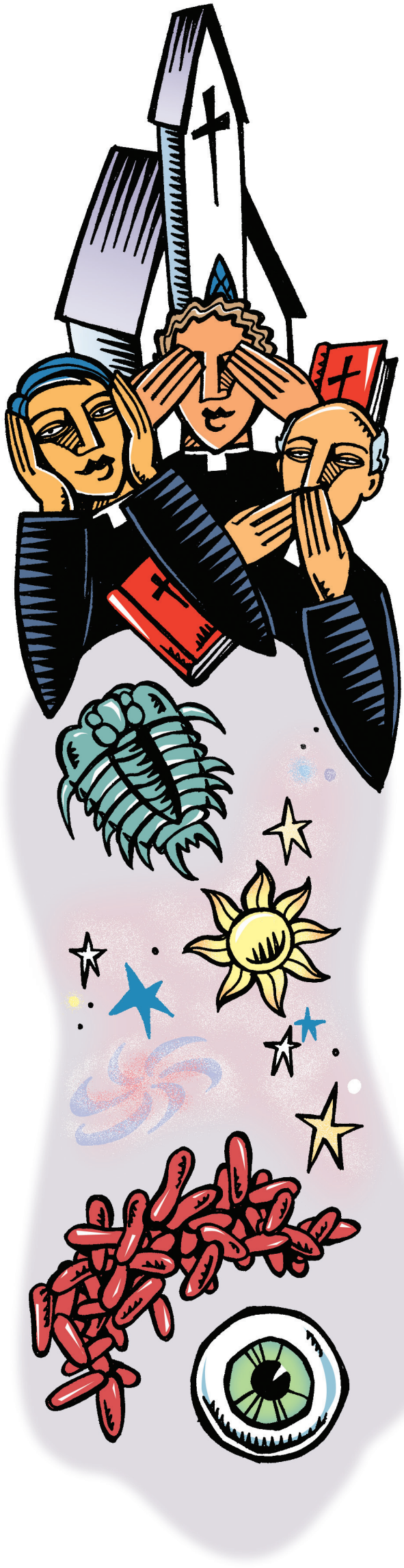
- Stalwart atheist Antony Flew hints in a letter to the editor of ***Philosophy Now*** that his views may be changing, however subtly. While rejecting Christianity, Flew, citing Darwin, says the latter probably "believed that life was miraculously breathed into that primordial form of not always consistently reproducing life by God, though not the revealed God of then contemporary Christianity, who had predestined so many of Darwin's friends and family to an eternity of extreme torture."

- Baylor University removes William Dembski as head of the disbanded ID center. Southern Baptist Theological Seminary courts Dembski to direct its Center for Science and Theology.

- ***Proceedings of the Biological Society of Washington*** publishes an article by Stephen Meyer, director of the Discovery Institute's Center for Science and Culture. The article is the first ID paper to appear in a peer-reviewed journal. The scientific community criticizes the journal's editor, Richard Sternberg.

2005

Antony Flew pens a new introduction to ***God & Philosophy***, repeating his inclination to, in the words of Plato's Socrates, "follow the argument wherever it leads."



Intelligent design's place at the table:

Taking the design out of

BY JULIA C. KELLER

Humans have marveled at design in spider web geometry, sunflower seed spirals and the twists of snail shells, long before Fibonacci discovered his famous sequence or Pythagoras understood the golden rectangle. Cells divided their DNA before Leeuwenhoek ground lenses for microscopes. Snowflakes fell before fractals. Electrons clouded around nuclei before quantum mechanics. And the big bang exploded the universe into existence before astronomers could point their fingers, and later their telescopes, at the sky.

That the complexity of nature argues for a designer is not a revolutionary idea, said Ronald Numbers, a historian of science at the University of Wisconsin-Madison. Numbers added that for the general public, the concept of God's design in nature is a no-brainer. "Ninety percent of Americans are theists. They're able to draw on a huge reservoir in a popular belief of a designer God," he said.

William Paley topped off this reservoir with his 1802 publication of *Natural Theology*, culminating centuries of design argument based on everything from the properties of water to the engineering of insects. In his book, Paley describes finding a watch while walking through the country. Paley argued that studying the watch's interconnected mechanical parts would compel one to assume that an intelligent force designed it.

Modern intelligent design theory, or ID, however, takes the concept a step further, stating that science will prove that some aspects of nature are so specific, complex or functional — like the parts of a watch — that they *must* be the work of a designer.

But ID proponents find themselves swimming upstream against some rather vigorous scientific currents.

Mainstream scientists say ID is not a scientific concept because it relies on supernatural causes. Invoking a "designer" of nature necessarily implies theology, something which science is not equipped to comment on. Mainstream theologians have also dismissed ID's theological implications.

"From the point of view of the most prominent theologians today, not only is ID poor science, it's also poor theology," said John Haught, a Catholic theologian at Georgetown University in Washington, D.C. "To think of God as a designer is to diminish the divine mystery."

Though intelligent design theorists don't specify God as the designer, ID proponents like Lehigh University biochemist Michael Behe said they would simply like their ideas heard. "There is more than one way to view what science has discovered," said Behe. "The more science knows about nature, the more strongly it seems to point beyond nature for an explanation," he said.

The science game is rigged

Mainstream scientists operate with a framework of methodological naturalism — seeking purely natural explanations that do not make reference to a divine designer.

"We stick to natural causes in science because it works," said Eugenie Scott, director of the National Center of Science Education, an organization that defends the teaching of evolution in public schools based in Oakland, Calif. "Science is brutally practical. If it works we grab it, even if we don't like it much," she said.

"In science, you need to introduce hypotheses that are capable of being tested," said Paul Kurtz, chairman of the Council for Secular Humanism in Amherst, N.Y. "It's a nontestable, nonempirical, nonfalsifiable hypothesis," said Kurtz of ID.

However, ID proponents say their attempts to scientifically understand the patterns in nature have been misrepresented at best and maligned at worst in the science domain.

"The ID argument requires that people that think methodological naturalism is intrinsic to science reconsider that," said Jay W. Richards a senior fellow at the bastion of ID — the Discovery Institute's Center for Science and Culture, based in Seattle. Evidence of design "when used appropriately, can be a part of the explanatory tools of natural science," Richards continued.

Scott and other scientists have said the scientific community has considered ID theory and rejected it as ineffectual.

"Science is exquisitely sensitive to the possibility and the certainty that error exists. All claims get reviewed," said Paul Gross, co-author with Barbara Forrest of the book *Creationism's Trojan Horse: The Wedge of Intelligent Design*. "After exhaustive review, those claims that turn out consistently without substance are forgotten."

ID proponents charge the definition of science doesn't allow for claims outside of its stringent rules. "Design advocates would allow all hypotheses to be considered — not just those that are strictly materialistic," said Stephen Meyer, the director of Discovery Institute's Center for Science and Culture.

Kurtz disagreed that rules of science are arbitrary or intentionally designed to keep ID from making its case. "The methods of science have been proven to be enormously successful and are vindicated by their pragmatic consequences," Kurtz said.

Meyer countered that ID's claims "shouldn't be decided by *a priori* rules of science," he said, but rather, "the debate should come down to the evidence."

ID proponents represent a spectrum of ideological positions and some of them don't automatically discount the evidence for evolution, nor do they disavow Darwin's theories about random mutation and natural selection as a driving force of evolution.

"Effects that are one small step away from normal are possible in Darwinian evolution," said Behe, citing as examples the evolution of pesticide resistance and the mutations in the sickle cell gene that confer resistance to malaria. "But the real question is how much can be built up by Darwinian processes?" Behe said.

"We're not saying it's better if Darwin had never contributed to science," said William Dembski, also a senior fellow at the Center for Science and Culture and director of Southern Baptist Theological Seminary's new Center for Science and Theology. However, he said of Darwinian evolution, "the proper scope of the theory has to be contracted in light of better evidence."

Show me the science

Scientific evidence for the designer behind intelligent design has been minimal, though the analysis of design in nature has been batted around for centuries. When James Watson, Francis Crick and Rosalind Franklin discovered the double helix structure of DNA — and the scientific community subsequently was able to point to a method by which Darwinian

the argument over ID

evolution could have arisen — the world was floored.

ID proponents point to the genetic information contained in a cell's DNA as too complex, organized and machine-like to have been produced by chance.

"Many researchers think that the question of origin of life turns on the origin of genetic information to build the first living cell," said Meyer.

Behe calls examples like DNA's compact, complex information "Cadillacs of complexity." The classic Cadillac most ID proponents drive may be the example of a bacterial cell's whiplike tail, called a flagellum, which it uses to swim.

"There's a part that acts as a propeller," said Behe, comparing the flagellum to an outboard motor. "There's a part that acts as drive shaft. There's a motor, which uses a flow of acid from the outside of the cell to the inside of the cell just like a turbine engine might be powered by a waterfall."

The bacterial flagellum's integrated and seemingly mechanical parts led Behe to coin the phrase "irreducible complexity"— a system dependent on all the parts working in concert to enable a function. Behe used the example of a mousetrap's parts — base, spring, catch, hammer and holding bar — to explain an irreducibly complex system.

"It's hard to see how tiny incremental changes can put together something like a standard mechanical mousetrap, and there's lots of thing like that in the cell," said Behe. "With irreducibly complex systems, it is extremely difficult to see how they can be approached gradually" in the framework of Darwinian evolution, said Behe.

However, scientists respond that not understanding the answer to a problem is different from not knowing it yet.

"Perhaps science can never satisfactorily explain how the flagellum could have been developed piece by piece," said Owen Gingerich, professor emeritus of astronomy and history of science at Harvard University in Cambridge, Mass. "But, I don't believe we can ever be in a position to say that we have to give up because no explanation can exist," he said.

"If your basic idea is: 'If X can't be explained through natural causes — bacterial flagellum, for example — therefore, God did it,'" said Scott, "that leaves you a pretty thin scientific model to work with."

ID doesn't name the designer as God, nor does it comment on it, said Richards, who also co-authored the book *Privileged Planet* with Guillermo Gonzalez, an astronomer at Iowa State University. "What design theorists argue is that something about what the world is like provides evidence for design," he said. "It is a claim that you don't need to presuppose a theistic framework to see that."

But design implies an end function or *telos*, said Gingerich. "At its core, intelligent design is a philosophical way of saying that the universe is made with intention and purpose, something I strongly believe, and to strip theological implications from it would destroy its *raison d'etre*," he said.

On a wing and a prayer

"Whenever you try to account for where life came from, it has implications beyond just science," said Behe, but that doesn't mean that ID should address it. "I'm sure philosophers and theologians can cogitate about this in their own fields," he said.

Historically, however, the idea that design in nature points to God as the designer can't be divorced from the ID argument, said Haught, pointing to the natural theology of Thomas Aquinas as an example. "Everyone understands this to be God. Anytime you talk about design in natural theology, you talk about God," he said.

"I don't think arguments for design prove the existence of God," said Richards. "I'd say they've positive theological implications, and theologians ought to be willing to explore that."

Design and theology are not at odds, said Richards. "This isn't a highly eccentric position to take within the Christian theological tradition," he said. "At least theologically speaking, I would think the burden of proof would be upon the Christian who says there isn't such evidence or there can't be for some theological reason," said Richards.

Disavowing God as the designer stymies intelligent design proponents, said Ted Davis, a professor of the history of science at Messiah College in Grantham, Pa. "Armed only with a generic designer," said Davis, "it is utterly impossible for them even to confront, let alone respond constructively to, the reality of a world that seems to so many to be so imperfectly designed."

On the other hand, calling God a designer "shrinks the notion of deity to a kind of a master engineer," said Haught. "It's to make the function or action of God that of coming down and stitching together amino acids capriciously," Haught continued. "That's fatal for theology," he said.

Science's description of the contentious issue of life's origins "doesn't say that life's been intelligently designed and it also certainly doesn't say that it hasn't," said Alvin Plantinga, a philosophy professor at Notre Dame University. "It's a complete mistake to think of evolution as unguided evolution," he said.

"Intelligent Design is being sold as an alternative to godless evolution, which is seen as a mechanical, purposeless scheme that has brought life — including intelligent, self-reflective life — into existence on the Earth," Gingerich said. "Science is neutral on the nature or existence of God. It is godless but not necessarily anti-God," he said.

ID's future

"The day that somebody produces evidence for intelligent design, I assure you that half the evolutionary biologists will be jumping on this the next day. Many of them would be happy to find out it was true," said Gross of the common misperception that all scientists are atheists. "We're not all rubber stamp products of poor Richard Dawkins."

However, Gross said, "The proof in the pudding is what there is to eat."

ID proponents may get their just desserts if the scientific community allows them to sit at the table, said Meyer. "We think design can open up questions that haven't been asked — even if it's only 10 percent," he said.

"By science's own hard labor we have come across all this unexpected complexity and intelligent design is an honest, straightforward attempt to account for what we've come up with," said Behe. "I would like people to relax a bit and realize that we're just trying to account for the world that we've discovered."

Whether or not that moves ID under the scientific umbrella may end up being decided by school boards, courts, the community and who's coming to dinner. ✖

Julia C. Keller is science editor at Science & Theology News.

INTELLIGENT DESIGN

WHO'S WHO: Intelligent Design Opponents

John Haught

Position: Distinguished Research Professor in Georgetown University's theology department.

Contributions: Haught and other prominent Catholic figures in the ID debate, such as former Dominican priest Francisco J. Ayala, have denounced the suggestion that ID is necessary to resolve a conflict between science — namely evolution — and religion because no conflict exists.

Kenneth Miller

Position: biology professor at Brown University and author of *Finding Darwin's God: A Scientist's Search for Common Ground Between God and Evolution*.

Contributions: He says the debate over intelligent design and evolution is both religious and political in that ID proponents want to enlist the government to ensure their ideas are taught in public schools under the banner of First Amendment protection.

Ronald Numbers

Position: professor of the history of science and medicine at the University of Wisconsin in Madison.

Contributions: He is author of several works on Darwinism, creationism and the conflict between science and Christianity, including *The Creationists: The Evolution of Scientific Creationism*.

Eugenie Scott

Position: executive director of the National Center for Science Education in Oakland, Calif.

Contributions: She is a longtime supporter of teaching of evolution in public schools and a frequent critic of intelligent design.

REQUIRED READING

Creationism's Trojan Horse:
The Wedge of Intelligent Design
Barbara Forrest and Paul R. Gross
Oxford, England. Oxford University Press, 2004.
401 pages. **$39.50 hardcover.**
In this book, Forrest and Gross examine in full detail the claims and operations of the intelligent design movement, explaining and analyzing what design theorists call their "wedge strategy." By displaying the movement's alliance with religious right extremism, the book reveals the significance of Dembski's statement that the ID movement's challenge to the "evolutionary naturalism of Darwin" is "ground zero of the culture war."

Darwin's Black Box:
The Biochemical Challenge to Evolution
Michael Behe
New York. Simon & Schuster, Inc., 1998.
320 pages. **$15 paperback.**
In his book, Behe makes a scientific case for the existence of God. By explaining the functions of the eye, blood clotting, and the immune system, he argues against evolution as the sole explanation for their existence. Instead of calling on religion to support his thesis, however, Behe explores the scientific literature for some of the alternatives to evolution and includes his own support for life by design at the end of the text.

Species of Origins:
America's Search for a Creation Story
Karl W. Giberson and Donald A. Yerxa
Lanham, Md. Rowman & Littlefield Publishers, 2002.
272 pages. **$24.95 paperback.**
Although creation stories are an essential part of every culture, Americans have not been able to agree on a common story since the late 19th century. Giberson and Yerxa examine the controversial debates surrounding creation as well as America's varied creation myths, which they dub "the species of origins."

Doubts About Darwin:
A History of Intelligent Design
Thomas Woodward
Grand Rapids, Mich. Baker Books, 2004.
303 pages. **$16.99 paperback.**
Beginning with Michael Denton's revolutionary book, *Evolution: A Theory in Crisis*, Woodward follows the key players and confrontations that are creating a paradigm shift in both the scientific and public arenas. He shows that the erosion of certainty about factual truth of Darwinism is the product of a rhetorical onslaught — the persuasive case made by intelligent design theorists.

Intelligent Design:
The Bridge Between Science & Theology
William Dembski
Downers Grove, Ill. InterVarsity Press, 2002.
312 pages. **$16 paperback.**
Dembski, currently a professor at Southern Baptist Theological Seminary, argues that intelligent design is a scientific theory that is only "mysterious" because scientific naturalism has blinded us from seeing and understanding design in nature. This collection of essays aims to show the lay reader how detecting design within the universe unseats naturalism. It is organized into three parts: an introduction to design, an examination of the philosophical and scientific basis for ID, and an explanation of how ID establishes the "crucial link" between science and theology.

ON THE WEB

American Scientific Affiliation
www.asa3.org
Presents results of faith-and-science investigations for comment and criticism by the Christian and scientific community

The American Society of Naturalists
http://www.amnat.org
Presents knowledge of organic evolution and other broad biological principles to enhance the conceptual unification of the biological sciences

BBC News' Evolution Website
www.bbc.co.uk/education/darwin/index.shtml
Presents evolutionary theory resources, as well as a historical account of Charles Darwin, including the full text of *Origin of Species*

The Discovery Institute
www.discovery.org
Promotes intelligent design theory with an institutional mission "to make a positive vision of the future practical"

The ID update
www.arn.org/blogs/index.php
Presents news and commentary updates for the intelligent design community

Intelligent Design the Future
www.idthefuture.com
Explores issues central to the case for intelligent design

Intelligent Design Network
www.intelligentdesignnetwork.org
Seeks to promote objectivity in origins education in public schools

GLOSSARY OF TERMS

Fine-tuning: the concept that the universe is specifically made to sustain human life, and any minute changes would make it impossible for life to exist

Anthropic Principle: the idea that the universe is specifically tailored for human existence, and that the universe itself could not exist without humans to observe it

Complex Specified Information: a concept that states that the complexity of a certain set of information makes it impossible for that information to occur at random, since it is assigned a specific purpose

Irreducible Complexity: states that when one part is removed from a system of well-matched, interacting parts, the system will effectively cease functioning

Methodological Naturalism: a principle that states that, in order for any study of the world to quality as "scientific," it must not refer to any sort of divine activity

Darwinian Evolution: the concept of evolution by natural selection, as introduced by Charles Darwin