

Convergence

Big-picture science and faith
find common ground
on ultimate questions

By Denyse O'Leary

*"He alone stretches out
the heavens and treads
on the waves of the sea.
He is the maker
of the Bear and Orion,
the Pleiades and
the constellations
of the south."
— Job 9:8-9*

(Above) An astronomer's photo
of the Pleiades star cluster
in the constellation Taurus.

**"Thomas Gradgrind, sir. A man
of realities. A man of facts and calculations."**

So Charles Dickens described his infamous 19th century materialist in *Hard Times*.

Gradgrind represented what was considered, 150 years ago, a "scientific" approach to reality: "... nothing but Facts," he insisted. As a man who embraced prevalent scientific attitudes and assumptions, Gradgrind represented a trend that would eventually declare God dead and religion absurd. Time and chance were elevated to the status of creator.

Yet when 20th century scientists started poking at Gradgrind's "Facts," his cosmos began to crumble, and it has been disintegrating steadily ever since.

Science – not Gradgrind's feared enemy, religion – obliterated his universe of atheism and materialism. Now at the close of the millennium, science is shoring up faith, while pushing Christians to face some very tough questions.

In the beginning

Atheism is extremely plausible if you agree with Gradgrind in one simple assumption: that the universe has always existed. Even a very unlikely event such as the origin of intelligent life might happen in an infinite amount of time – because maybe anything can happen

if we allow the possibility of infinite time.

If we believe that the universe (including space and time) started at a particular point, then we must ask, what sorts of events could "just happen" between then and now? And wouldn't "someone" have to start the events?

Using sophisticated instruments, today's astronomers routinely study galaxies at the outer edges of the universe, thought to be separated from us by 10 or 12 billion light years. So they have a much better picture of the cosmos than was available a century ago. Most people who study the universe no longer believe that space and time have existed forever. Rather, their studies suggest that space and time had a beginning, one that they generally place at about 15 billion years ago, in an explosive event called the Big Bang. The universe, these scientists believe, has been expanding ever since, somewhat like an inflating balloon.

A major effect of this Big Bang cosmology has been that the existence of a creator God is a reasonable assumption – not simply a matter of "faith" as opposed to "facts." God simply cannot be shoved out of any portrait of the universe that has a beginning. Even if one insists on a much briefer span of time than 15 billion years, allowing for any *finite* amount of time and space for the universe radically reduces the probability – which can be calculated mathematically – that the universe could form by chance alone.

But this new science poses a challenge for Christians.

Have we perhaps become too comfortable in a world where faith – so we are told – has nothing to do with science? Our Christian world is internally consistent; we seem adept at living in the arena of faith one moment and in the arena of science another, ignoring any tensions between the two. What will happen if people now say, “Okay – we see there probably is a God. What do you know about him? How do you know it? Can you prove it?”

Made in God's image

In his cosmos without a creator, Gradgrind believed that human life is the product of an accident of self-existing atoms juggling their way through eternity. But as Michael Denton points out in *Nature's Destiny: How the Laws of Biology Reveal Purpose in the Universe*, if the universe were not organized in the precise way that it is – to many decimal places of exactitude – intelligent life (such as ourselves) could not exist.

As a result, even scientists who are not religious believers frequently come away from their studies with an overwhelming impression of design. This feature, sometimes known as the “anthropic principle,” implies that God has a specific character. Apparently, he wills and purposes life. In other words, he is not just an abstraction crafted to explain how things got started, who then conveniently drops out of the equation.

Throughout the 20th century, many people have claimed that all religions are equally valid. What some often meant

Loving attention to detail

I have always been fascinated that animals with minuscule amounts of neural tissue can engage in amazingly complex behaviors. To me this speaks not only of the abilities of a God large enough to create the universe, but one who attends with loving detail to the least of his creatures. My God is Creator, Redeemer and Sustainer of the world. I believe that God as creator-participant chooses to relate to his creation both by holding it together moment by moment by his powerful word expressed in physical mechanisms, and also by revealing himself personally in the Word Christ Jesus.

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was that all religions were equally useless (or false or destructive), since nothing can really be known about the abstract principle called God. But if God has a character, as the anthropic principle suggests, some teachings about him must be true, and others false.

Many 20th century theologians have hoped to avoid this embarrassing and politically incorrect conclusion. They wanted to separate religion from knowable facts and defined faith in terms of virtuous feelings and commendable actions alone. They argued that religion inhabits one sphere, and science another. Religion is based on mystery, and science is based on fact. The two have nothing in common. Thus, the theologians could preserve what they really wanted to believe, safe from the glare of scientific materialism, because no one could know in a factual way what is true about God or religion. Meanwhile, some Christians retreated from science altogether, convinced that science was a synonym for atheism.

But the liberal theologians' preferred option may not really be defensible. Science is now confirming many premises that were intuited by traditional Judaism and Christianity, such as that God exists and that he planned

the universe. Also, science after Albert Einstein has become more mysterious than any religion.

So, essentially, the war is over: credible religion in the 21st century must have a rational basis – but must also recognize the essential mystery of the universe, in order to do justice to what we know about God.

A complex and mysterious universe

Gradgrind's resolve to stamp out imagination everywhere was steadied by his thought that he lived in a very simple, eternal universe. Like mathematician Simon Laplace (1749-1827) and many others in the 19th century, he thought that if you have enough information, the universe would be completely predictable.

In a series of discoveries so stunning that they were and still are a challenge to the imagination, 20th century science blew all that away.

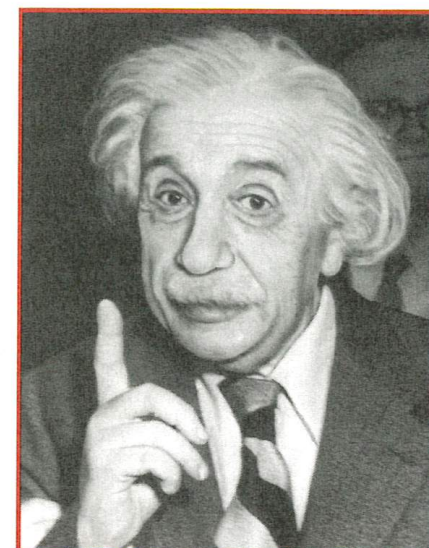
Uncertainty principle: The German physicist Werner Heisenberg's Uncertainty Principle shows that one can never truly measure all aspects of the tiny particles that make up the universe. Unlike a fastball bearing down on home base, which a competent batter can hit by determining both its place and speed, subatomic particles *do not have* both position and speed at the same time. It would be an understatement to say this is difficult to understand, yet this bizarre but proven observation is central to making your CD player and home computer work.

It also means that the dream of a completely predictable universe and a completely planned society, much favored by atheist philosophers, is thwarted at the level of the very building blocks of the universe. A humble electron would frustrate Gradgrind indefinitely; and chaos theory – which suggests that there are vast unpredictable consequences from simple actions – would leave him devastated.

Relativity: Gradgrind believed that his watch measured eternal and infallible time, ticking away from all eternity. Space was simply the fixed distance between objects; he could measure it if he had a long enough ruler.

However, Albert Einstein (1879-1955) demonstrated considerably more imagination and insight. In addition to unleashing the power of the atom, and thereby making the equation $E = mc^2$ pop culture's only consistently recognized equation, Einstein showed that time changes with the speed at which the observer is moving. If one travels at near the speed of light, time slows down.

Meanwhile, space is not ruler-straight at all. It is curved



Albert Einstein: His theories made science mysterious.

PHOTO © CANAPRESS PHOTO SERVICE

around large heavenly bodies like our sun. (To simulate the effect, place a bowling ball on your mattress and roll a marble towards it. Will the marble run straight, curved, or both?)

These ideas are hard to understand because we can't travel the distances and speeds that make them evident. Yet phenomena such as curved space and relative time have been confirmed by scientists' observations in physics and astronomy. If ever humans do travel very far into the universe, these dynamics must be taken into account.

Quantum physics: The science that studies the behavior of the tiny quantum particles that make up atoms produced findings that were too strange even for Einstein to accept. These particles can leap great distances without actually going through the space in between. They can change their fundamental qualities to evade measurement. And light particles (photons) can behave as though time does not exist.

Niels Bohr (1885-1962), one of the founders of quantum physics, said, “If someone says that he can think about quantum physics without becoming dizzy, that shows only that he has not understood anything whatever about it.”

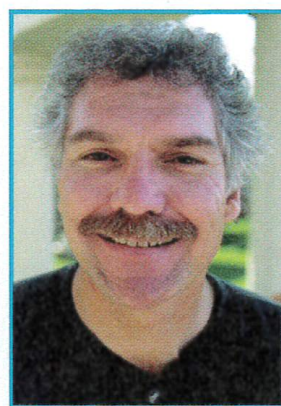
All these discoveries leave the universe in the same condition that caused King David to muse in Psalm 139 – that

Care for creation

Christians are to care for creation in such a way that it can continue to praise God. When humans exploit or abuse creation they take away from this task. Humans may enjoy the fruits of creation for sustenance (water, food, livelihoods, etc.) but they may not destroy its fruitfulness. When Christians practise recycling, buy environment-friendly products, conserve water, trees and soil, and act as advocates for endangered species they are helping creation to continue in its task of praising the Creator.

My teaching aim is to prepare a new generation of Christian, environmental professionals who know and accept faith-based principles and can apply them to environmental issues so that biblical stewardship is practised by government, industry, churches and all institutions in society.

Dr. Harry Spaling
Director of Environmental Studies
Assistant Professor of Geography & Environmental Studies
The King's University College



Key new science ideas in the twentieth century

Anthropic principle: This universe and in particular this planet seem uniquely designed to support life. Very slight alterations would render life impossible.

Big bang: Most scientists now believe that the universe is not eternal. It had a definite beginning about 15 billion years ago.

Microbiology was revolutionized in the 1950s with the development of the electron microscope. It has shown that there are no “simple” organisms, causing many to question if life could arise by chance.

Quantum physics: The behavior of subatomic particles makes completely accurate prediction impossible.

Relativity: Time and space are not absolute and eternal. Space curves and time runs fast or slow, depending on the observer.

the "heavens" are a wonderful, mysterious place, inviting study and meditation.

Meanwhile, around the corner awaits a still more controversial issue.

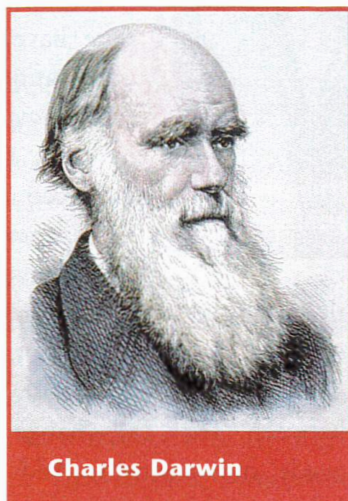
Signs of intelligent life

When Charles Darwin (1809-1882) was working out his theory of evolution, in which all creatures descended from a single organism, he made one key assumption: that single organism was a simple jelly that might have arisen naturally through time and chance.

Yet Darwin had never seen inside a cell, the basic unit of life. That wasn't even possible until the development of the electron microscope in the 1950s. When scientists peered inside, they found an amazing array of interrelated molecular machines working together to perform complex functions.

In 1996 biochemist Michael J. Behe at Lehigh University in Pennsylvania stirred up a controversy with his book *Darwin's Black Box*. A Roman Catholic, Behe had accepted evolution in principle – until he tried relating it to his own discipline. The trouble was, he couldn't. He found instead that cells showed "irreducible complexity."

Many cells will not function at all unless a number of



Charles Darwin

PHOTO © NORTH WIND PICTURE ARCHIVES

complex processes all run very precisely at the same time. Either it all functions immediately or the organism is dead. And there is no "simpler" life form that the cell could have evolved from. In fact, there is no dress rehearsal for life. This, Behe said, points to an intelligent designer behind the origin of life, rather than time and chance.

Behe's work is controversial, to say the least, among orthodox evolutionists. However, as a working biochemist his findings have been reviewed in science journals.

He told *Faith Today*, "In private conversations a number of scientists will admit that something like intelligent design does seem to be true. [But] for a scientist to say that in public there could be repercussions. I sure wish that more of them would speak up."

It is too soon to tell whether evolution theorists will come up with an explanation or simply continue to attack Behe and others now beginning the public discussion about intelligent design. If they don't provide an evolutionary explanation, Behe's work may hammer the final nail into the coffin of Gradgrind's universe.

The problem of evil

Will these 20th century scientific discoveries make evangelism easier in the next millennium? Not necessarily.

Indeed, the scientific findings that show God's awesome handiwork actually sharpen some difficult questions, according to Hugh Ross, the Canadian-born astrophysicist who is president of Reason to Believe, a California-based evangelistic organization aimed at research scientists.

For example, when a long-awaited baby is stillborn, will the parents find it easy to believe in an intelligent designer?

"That's one of the biggest problems we have in our ministry," Ross admits. "It's not that secularists don't like what we're saying; it's that Christians don't like what we're saying. They're confronted with issues that they have never been confronted with before."

That's because a century of liberal theology has effectively separated faith from reason. Churches now expect to provide emotion-based responses to difficult issues. But if scientists begin to suggest that God exists, people are increasingly going to want churches to relate dogma to observed facts.



Robert Mann
President, Canadian Scientific and Christian Affiliation
Professor of Physics and Applied Mathematics
University of Waterloo

Perpetual sense of wonder

The strongest link between my chosen career path as a physicist and my chosen faith path as a Christian is a perpetual sense of wonder. The awe-inspiring, mathematically regular laws of physics, and their often surprising consequences, always demand a deeper explanation than physics itself can provide. For me the search for this deeper explanation finds its beginning in Jesus Christ. It is in commitment to Christ that the larger questions raised by physics can be set in a context in which issues of purpose, justice and ultimate meaning are addressed. Scientific advances do not necessarily provide us with the wisdom to make good use of them.

"When I speak on a university campus, people say, 'Okay, if [the Intelligent Designer] is the God of the Bible, I want to talk about evil and suffering, free will and predestination, the mathematical absurdity of the Trinity,'" Ross said. "These are questions that many Christians prefer never to deal with."

Ross himself loves these questions: "I've got the non-Christians exactly where I want them!" he said, because it means that they have conceded that the traditional "hard questions" are the truly important ones.

Phillip Johnson, a University of California, Berkeley law professor who has frequently sparred with traditional evolutionists, thinks that tackling these issues will help Christians primarily: "One of the reasons why Christianity has no intellectual standing in the universities is because it has been running away from issues," he said.

It's not that Christians do nothing. Quite the contrary; in the late 20th century, Christians have formed the backbone of palliative care, providing compassionate support for people who are dying and their families. And Christians are over-represented among people who relieve suffering, including truly difficult ministries such as in prisons and among ex-convicts. But we have largely avoided intellectual issues, thinking perhaps that we have nothing to contribute anyway. This may be about to change.

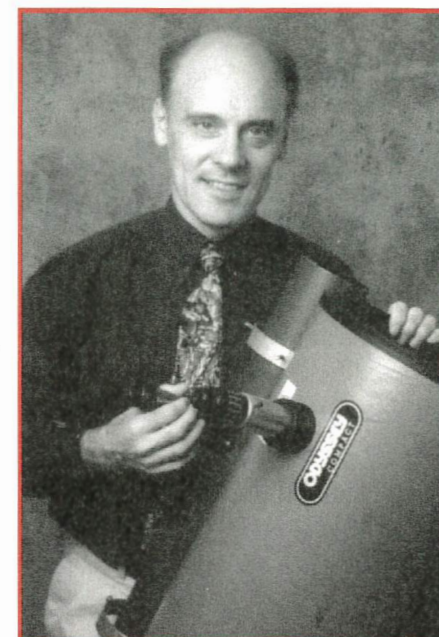
Crushing the life out of Earth

But, ironically, just as the world comes to accept that some of the things that we have always believed are true, our challenge as Christians has moved on to something else. Science can explain many things. But it cannot tell us what things are

Elegance and harmony

I marvel at the elegance and harmony of the brain and structures of the body. I have a simple faith that gives God credit for the design and accepts our understanding of the evolutionary process as the best explanation that we have to date, regarding how God did it. The stories are quite compatible, and in fact complement each other.

Gary Partlow
Professor of Anatomy and Neuroanatomy
Ontario Veterinary College



Hugh Ross: A century of liberal theology has separated faith from reason.

PHOTO © REASONS TO BELIEVE

important. For example, it does not answer questions such as "Am I my brother's keeper?" or "What does it profit a man to gain the whole world if he loses his own soul?" or "If a man dies, will he live again?"

A more significant question today than ever before is: Will the creation itself really be liberated from its bondage to decay and brought into the glorious freedom of God? Or will it simply be progressively destroyed by human folly, until we destroy ourselves?

The biggest challenge we face today does not require an

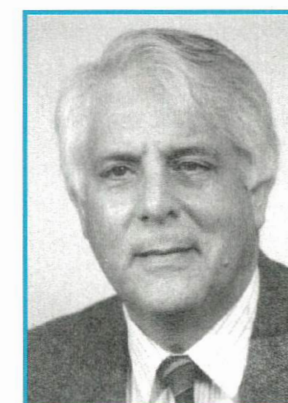
electron microscope or a space telescope. It is visible to the naked eye. It is the environmental destruction that reveals our true view of God's creation. The rapid growth of the human population during this century – based on the spread of Western science and medicine – is creating a planet on which six billion people will strive for the lifestyle of the materialistic West. But our consumer patterns, based on standards of disposability, are unsustainable.

Already massive deforestation and the continuing glob-

Complex, wonderful and beautiful

The natural order in general, and the human body specifically, is incredibly complex, wonderful and beautiful at any level of observation, be it the molecular level or the tissue, organ, or whole body level. What we know boggles the mind as does what we don't yet know. Sometimes it all seems unfathomable. The wonder of it all certainly provokes a Christian to acknowledge and worship the creative power of the great Creator, as expressed by the psalmist in Psalm 19 ("The heavens declare the glory of God and the firmament shows his handiwork").

Dan Osmond
Professor of Physiology and Medicine
University of Toronto



al warming (probably due to use of fossil fuels) are producing profound changes in the delicate, life-sustaining physical structure of the planet. Biologists fear that the coming century will witness a great extinction in which, for example, half of all bird species alone may disappear because of forest destruction. People, as well as animals, are increasingly at risk from severe weather originating in the ecological imbalance.

Is this how we were supposed to care for creation?

Or does the creation matter? Does it matter if grizzlies become extinct, as long as there are cute stuffed toys made by unschooled children in Third-World sweatshops? Is there any inherent dignity or value in, or purpose for, the people and animals that God has made, which deserves our response?

Some people – Mr. Gradgrind would understand them, no doubt – believe that cloning and other biotechnology will rescue us by preserving extinct animals in lab jars and altering our bodies so that we can withstand the growing pollution. They think the “end of nature” is a desirable thing – that parking lots are a fair trade for parks. And some Christians ask, isn’t the second coming of Christ imminent and this world doomed anyway?

Noted Christian environmentalist Loren Wilkinson, a professor at Regent College in Vancouver suggests that Christians should forget their differences about how creation got started and work to reverse the current relentless trend toward destruction. “If we’re asked to stand before

Note: Some Christians insist on a much shorter time for the age of the universe than 15 billion years. But allowing for any *finite* amount of time and space for the universe, probability can help us determine if everything we discover could happen by chance alone.

Suggested further reading

- Behe, Michael, *Darwin's Black Box*, Free Press, New York, 1996.
- Davies, Paul, *About Time: Einstein's Unfinished Revolution*, Simon & Schuster, New York, 1995.
- Davies, Paul, *God and the New Physics*, J.M. Dent & Sons, London, 1983.
- Denton, Michael J., *Nature's Destiny: How the Laws of Biology Reveal Purpose in the Universe*, Free Press, New York, 1998.
- Ferris, Timothy, *The Whole Shebang*, Touchstone/Simon and Schuster, New York, 1997.

Suggested Web sites of interest

- <http://www.reasons.org> – an international, interdenominational ministry established to communicate the factual basis for belief in the Bible
- <http://www.arn.org> – Access Research Network, a site on arguments for intelligent design of the universe
- <http://ic.net/~erasmus/RAZ15.HTM> Creation, a site featuring scientific arguments for God and creation

Intelligence behind the universe



PHOTO: CATHY PAGE

I would say that in science, to quote Johannes Kepler, we are “thinking God’s thoughts after him.” As a Christian, one of the motivations for my doing science is to try to understand the universe which God has created, and thereby to try to understand God better. As Psalm 111:2 says, “Great are the works of the Lord, studied by all who delight in them.” Although what we do not understand surely far exceeds what we do understand, it is remarkable how much of the universe we can understand. Christians may find a partial reason in the fact that God has created us in his image. Science reveals the intelligibility of the universe; the Bible reveals the Intelligence behind the universe.

Don N. Page
Physicist
University of Alberta

God in judgment and account for creation, we’ll be asked to account for what *we* did, not what God did,” he warns.

As we ponder the decisions we must now make, we should keep in mind that science originated in Judaeo-Christian and Muslim societies, among people who believed that the Earth is a good creation of God. “Science is an ally in helping us understand what creation is telling us about itself and indirectly about its maker,” Wilkinson suggests.

One great irony is that in the 19th century many thinkers strenuously promoted materialism as an escape from dogmatic religion. Today materialism is a dogma from which our society needs to escape. The materialists saw science as their great ally; today science seems to be dismantling the materialistic universe block by block. Although widespread acknowledgment of the implications of what scientists are uncovering won’t come easily – there will be no mass conversions or declarations of faith in the scientific community – those implications are becoming clearer all the time.

Yet great scientists are people of imagination. So are people of great faith. Once we get out from under the rubble of Gradgrind’s universe, we may again see the stars – or study atoms – with heads full of knowledge and hearts full of faith, and both overwhelmed with awe. ☐

Denyse O’Leary (oleary@interlog.com) is a Toronto-based freelance writer. She credits her interest in science to a former teacher, Irwin Talesnick of Runnymede Collegiate in Toronto. An innovative Grade 12 chemistry teacher in the 1960s, he adopted as his motto, “Science is a verb!”