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SPECIAL ISSUE

VITAL Theology
Helping People Think Theologically

Film Raises Questions about Reality of Universe

The Real Physics-Theology Debate Plays in Berkeley

What the Bleep Do We Know!?, a new movie that raises important questions for science and theology, is attracting a growing, nationwide audience.

The intention of the film's directors is to answer these questions: "What is the universe? Where do we fit in? And, why do we do what we do?"

Theologically informed cultural critics who were interviewed by *Vital Theology* (see pages 2-3) questioned the answers the movie presents and the way it presents them. But they also praised the film for raising awareness of the theological implications of quantum mechanics and for tapping into a thirst for spiritual understanding.

Vital Theology also interviewed the director of the Center for Theology and the Natural Sciences in Berkeley, Calif., (see pages 4-5) to explore the scholarly conversation about theology and quantum mechanics.

The online magazine *Salon* noted that the movie "presents itself as the thinking rebel's alternative to Hollywood pabulum: a heady stew of drama and documentary, starring Oscar-winning actress Marlee Matlin as a Xanax-addled photographer who discovers joy when she learns that quantum mechanics makes spiritual wonders possible."

Bleep debuted in February in the small town of Yelm, Wash., near Olympia and was given one week to build an audience. After surviving for months in a few art houses, *Bleep* was playing in more than 100 theaters in 30 states by late September. That's a far cry from the 3,000 theaters commanded for the opening of *The Passion of the Christ* but a strong start for an independent film that focuses on serious topics and has ambitions for international distribution.

The movie is part documentary, part story, and part elaborate visual effects and animations. It features talking-head interviews with 11 diverse experts, ranging from a Columbia University physicist to Ramtha, a supposed 35,000-year-old warrior spirit channeled by Judy "JZ" Knight.

The movie's marketers may have succeeded in imbuing the film with cult-like status but say they are not promoting a cult. The film has built momentum through a legion of fans who are instructed on the Web site (www.whatthebleep.com) to evangelize on its behalf.

According to *USA Today,* some moviegoers are using the film as a therapy session, seeing it 10 times or more. "I've gone once a week since it came" to Los Angeles' Beverly Center theater in June, Phillip Roosevelt, 44, told the newspaper. "I bring someone new each time, and we have coffee for an hour to talk about it."

Still, the trio of directors felt compelled to issue an open letter to U.S. media to refute "the intellectual defamation by certain critics of some profound, life-altering concepts in our film."

The directors accuse the media of trying to debunk ideas that make reviewers uncomfortable, including the notion that humans create reality by specific neurological wiring, the concept that reality is repetitive because of repetitive thinking, the notion that knowledge of this process can free people from it and the idea that "there is no God separate from us who is keeping score and moving us around like mindless chess pieces."

Marlee Matlin stars with animated characters, variety of experts in *What the Bleep Do We Know!?*

The movie conveys these concepts through its 11 talking-head experts and in the narrative story of Matlin's character, Amanda, who questions the fundamental premises of her life—how she views men, relationships and her work.

By comprehending the hidden knowledge of quantum mechanics, the movie's online publicity states, Amanda "conquers her fears, gains wisdom, and wins the keys to the great secrets of the ages. … She is then no longer the victim of circumstances, but she is on the way to being the creative force in her life."

WHAT IS QUANTUM MECHANICS? WHY SHOULD WE CARE?
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Movie Proves Transformative
More than New Age Spirituality

Barry Taylor, adjunct professor of pop culture and theology at Fuller Theological Seminary, says the film *What the Bleep Do We Know!?* is beginning to attract church groups in Los Angeles because it has successfully tapped into a deep, spiritual hunger.

Taylor, who also is the leader of New Ground, an alternative worship community in Los Angeles, knows that the first-run life of most movies is a scant few weeks. But "this one has some legs," he said.

He first became aware of the film when two friends told him it had changed their lives.

"Within a certain constituency," said Taylor "there's a definite sense of something transformative going on there."

Taylor believes the film is helpful in expanding the public conversation about God because it allows room for the re-emergence of the concept of transcendence within the realm of science.

"What I find really interesting is the central idea that the mind plays a big part in the kind of life that you have," he said. "So I see it very much in the emerging idea of the marrying of old religious faiths with … western science."

Walter Anderson, president of the World Academy of Art and Science, is among those who have suggested that such a marriage holds the future for spirituality, Taylor noted.

"It seems to me there's a growing edge of the church that's less afraid of wrestling with new ideas and is perhaps really interested in working out how new ideas about consciousness or reality or the nature of truth can help them on their faith journey," he said. "I think the film speaks clearly to that."

On one level, the film is quite corny, and the narrative about Marlee Matlin's character is strung together naively, he said. But the practical, transformational journey that Amanda takes gives credence to the theories being advanced by the movie's talking-head experts.

Movies with overtly religious themes often are ineffective, said Taylor.

"Film is a medium where you need to have a little bit of mystery and allow people to come to their own conclusions," he said.

Taylor believes the church must be conversant with people on the leading edge of culture if it is to have any impact.

"There are obviously some alternative spiritual dynamics that are at work in the film and the film doesn't necessarily support any of the traditional religions overtly," he said. "But for me it's too easy to dismiss it as New Age spirituality because I think it points to some larger things that are going on in the culture about the way we understand things like reality, what it means to be human, how we deal with our addictions, and the role that the mind, thoughts and actions play in our lives."

New Age spirituality itself is undergoing rapid change, said Taylor, who spends much of his time exploring alternative religious circles in the amazing laboratory that is Los Angeles.

"It seems to me there's a growing edge of the church that's less afraid of wrestling with new ideas and is perhaps really interested in working out how new ideas about consciousness or reality or the nature of truth can help them on their faith journey."

"As heretical as this may sound to some people, there's not much different going on out there as there is in the church in terms of how people are trying to make faith work in their lives," he said. People are seeking a faith "that is not just merely a set of abstract ideas, but a practical, lived reality."

Barry Taylor and Craig Detweiler (a fellow Fuller alumnus and screenwriter) are co-authors of *A Matrix of Meanings: Finding God in Pop Culture.*

Movie Casts Religion in Minor Role
Advocates for Personal Happiness over Community

Jeffrey H. Mahan, professor of ministry, media and culture at Iliff School of Theology, in Denver, has little love for the way the movie *What the Bleep Do We Know!?* sneaks up on its audience.

In addition, he noted, it takes no note of the fact that the world's best-known quantum physicist, Stephen Hawking, has concluded that it is impossible to believe in God once one takes seriously the implications of quantum mechanics.

The film begins as though it were a story about science that is simply helping the audience think about the implications of quantum mechanics. Although it never specifically cites his work, the movie seems most attuned to Niels Bohr's principle of complementarity, which was designed to resolve the paradoxes of quantum theory. But by the midpoint, "you begin to see that there really is an agenda about the theological implications of this work," said Mahan.

Withholding the titles of the 11 experts until the end seems to serve a similar masking purpose, he said.

"I guess I experienced that as a kind of intellectual dishonesty," said Mahan, an ordained United Methodist minister.

"This work does help us think about theology, about religious matters in new ways which can be helpful to us," he said. "It's not that I am at all upset that they're going there. I have some disagreements with the conclusions that they draw, but … it feels like they're setting you up for a conclusion that they don't tell you is coming."

The film presents a reading of traditional religion that is reducible to the assertion of the conflict between good and evil and the idea of eventual reward or punishment, he said. Mahan noted that Buddhism, Christianity, Hinduism and Judaism are complex systems of thought in which the ideas of reward and punishment have had some importance historically, but these are not the only ways that people in traditional religions have thought.

"There's a long Christian ethical stream that would talk about our obligations within this world and not just about some reward or punishment," said Mahan. "Beyond that, the film seems to dismiss the very idea of a useful conversation about good and evil."

At one point, one of the film's experts declares that there is no good and there is no bad.

But if people are to live ethical lives of consequence in the world, there is a necessity to say that some things are evil, Mahan maintained. Pol Pot's Khmer Rouge regime in 1970s Cambodia, Stalin's fascist state, and the recent history of Iraq are examples of evil that need to be confronted, he said.

Said Mahan: "I don't think that needs to be a reductionist conversation which says some people are the embodiment of evil, some people are all good—we're the heroes and they're the bad guys. But we need to be able to talk about the consequence of human behavior and about the human experience of evil and make judgments about that. A kind of blissful presence in the universe that doesn't take those things seriously seems to me unhelpful in living in a way that has consequence in the world."

Jeffrey H. Mahan

> "The conclusion seems to be that if one embraces the filmmaker's understanding of the implications of quantum mechanics, the result will be that you get a boyfriend."

At the heart of Mahan's criticism is his observation that the film advocates for individual happiness and ignores the communal experience of religion that has implications for how lives are to be lived.

"The conclusion seems to be that if one embraces the filmmaker's understanding of the implications of quantum mechanics, the result will be that you get a boyfriend," he said.

Nevertheless, Mahan lauded the film's response to spiritual longings.

"(Clergy) are going to find themselves invited to come into conversations about this," he said. "It is in some ways too easy to say this is a flaky, New Age riff on these themes. These themes are important to people who are trying to take them seriously. And even if we want to posit a wider conversation, we don't want to do that in a way that is dismissive of people's desire to have integrated lives in which their scientific understandings and their religious understandings come together."

'New Science' of Quantum Mechanics Creates Space for God

Physicist and theologian Robert J. Russell would never stake his faith on quantum mechanics, but he does have some rather immodest hopes for such theories.

Take, for example, the possibility of healing the two-century-old split between liberal and conservative theologies.

Since he founded the Center for Theology and the Natural Sciences (CTNS) in Berkeley, Calif., in 1981, Russell has been a leading proponent for interactions between rigorous theories of mainstream natural science and the central positions of mainstream theology. An ordained minister in the United Church of Christ, Russell holds an appointment with the Graduate Theological Union, which offers CTNS courses at the seminary and doctoral levels.

Today, quantum mechanics is accepted as a foundational theory of physics. It is not a fake, said Russell, although as with all scientific theories, it will eventually be replaced by a better theory.

What is at stake with quantum mechanics is an interpretation of the reality of the world. Theories of quantum physics have been percolating since the early 1900s and took shape in the 1930s. But quantum mechanics remains so unusual that it continues to be a stunning phenomenon to physics.

To make things more confusing, there are a variety of competing interpretations, all of which seem to be legitimate in that no one can point to empirical evidence that favors one over the others.

Instead of empiricism, the criteria for judgment are in the eye of the beholder: Which is the simplest interpretation, the most elegant interpretation, the one that appeals to religious or philosophical sensibilities, the one that fits best with postmodern culture?

The leading scientists of the 1920s, '30s and '40s—Niels Bohr, Paul Dirach, Albert Einstein, Werner Heisenberg, Max Planck, Erwin Schrödinger—debated the meaning of quantum physics.

But the point that often is missed, said Russell, is that each of the interpretations has a root in philosophical and theological perspectives that the scientists brought to the table.

Christian thinker Soren Kierkegaard influenced Bohr. Einstein, who rejected his Jewish tradition on the surface, was indebted to 17th century philosopher Benedict Spinoza for giving his deterministic God a point of view. Heisenberg was quite willing to accept that things happen without a preceding cause.

Many scientists have concluded that science is not simply a cognitive, rational project advanced through hypothetical deductive loops and logic, said Russell. In fact, esthetics, ethics, cultural values and gender perspectives all play a part in developing scientific theories.

Robert J. Russell

Esthetics, ethics, cultural values and gender perspectives all play a part in developing scientific theories.

British physicist Fred Hoyle, a rabid atheist, proved the point, said Russell. Incensed that Pope Pius XII had blessed the Big Bang theory as God's truth, Hoyle constructed an alternative cosmology to fit his own philosophical/theological view of the world, namely atheism. Because Hoyle was committed to his view, he was able to develop a theory that competed successfully with the Big Bang for 20 years.

Russell believes Christians involved in cosmology, quantum mechanics, quantum field theory or evolutionary biology should do the same thing. If Christians were as explicit about their theological view of the universe as Hoyle was about his, they would ask questions that other scientists aren't thinking about, he said.

Quantum physics is interesting to theologians because it avoids a deterministic picture of the universe. By introducing chance or indeterminacy into the physical universe at the atomic level, some theologians have observed that this creates room for either human choice or divine choice to affect the outcome of the physical universe.

Many theologians have advanced their theological positions through the various theories of quantum mechanics.

Changes in Science Open Dialogue

In his paper, *"Bridging Science and Religion: Why It Must Be Done,"* Robert J. Russell notes the dramatic changes in scientific thinking that have allowed theological concepts back into the scientific discussion:

"In the midst of what could be the sunset of Western religion after three thousand years of light, astonishing discoveries in the natural sciences and equally impressive changes in Western philosophy are re-opening the grounds for dialogue with theology. Relativity theory, quantum mechanics, Big Bang cosmology, chaos and complexity, human genetic engineering, transfinite mathematics and artificial intelligence are challenging, even tearing down, the rigid and simplistic Enlightenment assumption that the world is a closed network of cause and effect, an autonomous machine made entirely of tiny bits of matter in motion. In its place, the visions of nature suggested by the discoveries of Einstein, Heisenberg, Hubble, Hawking, Godel, Watson and Crick, though widely differing among each other, point in concert to a nature more open, subtle, numinous, interconnected than we have known for centuries. In the emerging worldviews of the 'new science' our existence as evolutionary creatures gifted with life, self-consciousness and moral agency no longer separates us from the universe around us."

Bohr's principle of complementarity—that items can be separately analyzed as having contradictory properties—has led physicists to conclude that light is both a wave and a stream of particles—two seemingly mutually exclusive properties.

Theologians, on the other hand, have used Bohr's theory to talk about Christology.

In a Nicene context, it is asserted that Jesus is both fully human and fully divine. To say that humanity equals divinity would be heresy. But to use both divinity language and humanity language to describe Jesus is to leave an element of mystery—just as Bohr's theory allows in physics.

To speak like this, said Russell, is not to try to use quantum mechanics to prove Christology. Rather, it is to point out the intellectual parallel that even scientists have to accept paradoxes to describe the world. Theologians assert that these paradoxes get at the reality that is experienced in Jesus of Nazareth.

"I'm trying to find a way of relating in a scholarly way the results of science interpreted philosophically with the results that I have in theology."

Among those who have explored this area are Thomas Torrance, an influential theologian from Scotland; Christopher B. Kaiser, professor of historical and systematic theology at Western Theological Seminary, in Holland, Mich.; and Ian G. Barbour, professor emeritus of physics and religion at Carleton College and the 1999 Templeton Prize winner.

Like Heisenberg, some theologians have argued that if there really are events that don't have a physical cause, then one can say that God is involved in particular ways in those events.

This "noninterventionist, objective divine action" theory really upsets the applecart for Newton, who viewed the world as a clock that had been set in motion by God. In Newton's interpretation, God had no role in the world after creation.

Newton's mechanistic view of the world split Protestantism into two camps—conservatives and liberals—over matters much greater than whether the Red Sea actually parted, said Russell.

When the mechanistic view is accepted as the correct interpretation of how the world evolved for billions of years before humanity arrived on the planet, it seems to say that God had no role once the process was put in motion. Thus, people of faith were forced to choose between a view that included miracles, in which God intervened in the physical laws of the universe, and the views of Friedrich Schleiermacher and other liberal theologians of the 19th century who rejected the notion of miracles.

But quantum mechanics can negate this either-or equation. At the very least, it serves notice that one cannot speak of a world without God, said Russell.

"As a Christian, I believe that God acts in the world," said Russell. "That's a given part of my understanding of what the Christian tradition is all about."

With quantum mechanics, "I can tell you what I mean by that in the physical, biological world of nature without appealing to this problem of interventionism. Therefore, I don't need to be caught up in the split that has so tragically divided liberals and conservatives."

That really is "good news" for Christians, said Russell.

Theistic evolution, which asserts that God acts through evolution, does not go deeply enough for Russell. That theory does little more than baptize the natural processes, he said.

He dismisses theories of natural design as red herrings because, he said, proponents of natural design try to

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New Science

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move evolution from being a biological science into being sociology, psychology or something else.

Russell does find a powerful argument for evolution being God's handiwork in genetic mutation.

As one of the key factors that drives evolution, genetic mutation is viewed by scientists such as Stephen Hawking as blind chance, in which there is no room for God to act.

But genetic mutations involve quantum mechanical processes, said Russell. In fact, every genetic mutation involves breaking a hydrogen bond, a quantum mechanical process about which there is no dispute among scientists.

That's exactly the point at which some theologians believe God can act without intervening in God's own laws.

In this philosophical theory, "God, in fact, is acting at the heart of what drives evolution—namely genetics—and acts with a purpose because God always acts with a purpose, even though we may not always know what that purpose is," he said. "Therefore, you don't need to see genetic mutations as a form of blind chance and cede it to the atheists."

Russell believes that Christians, Jews and Muslims should concentrate on rebuffing atheists rather than arguing about whether science is inherently atheistic. Science is the victim when it is claimed as the exclusive ground of atheists, he said.

Although many additional theological arguments can be seen as compatible with quantum mechanics, Russell cautions against trusting faith to the vagaries of scientific theory.

"Let me be the first to say that this whole approach could go belly up tomorrow," said Russell. "All of these philosophical interpretations of quantum mechanics are open for debate. To date, no one has succeeded in showing that one interpretation is absolutely better than the others. But it could be that there's a bright student someplace who is about to publish her Ph.D. thesis and she will show that this indeterminate interpretation is gone.

"That's why it is very tricky research," he said. "It's not that I'm going to stake my faith on quantum mechanics—heaven help me. I'm trying to find a way of relating in a scholarly way the results of science interpreted philosophically with the results that I have in theology for other reasons—the Bible, history, traditions of the faith community and so on. I'm trying to bring together a view of divine action with an interpretation of quantum mechanics."

Science-Theology Dialogue Tilted to One Side

All Human Inquiries Deserve Respect

The difficulty with dialogue between theology and science is that the scientists set the boundaries, says a veteran theologian who has participated in dozens of theology-science discussions.

William Dean, professor emeritus of constructive theology at Iliff School of Theology, said he is still waiting for the day when scientists accept the finding of theologians that history is meaningful. By doing so, scientists would be forced to avoid a deterministic picture of the world.

A good scientist wants to push his or her theories as far as possible to explain as much as possible. But this leads to a kind of reductionism, said Dean, because scientists try to shrink the world to fit their own formulas.

"It seems to me that they need to be more respectful of all humanistic inquiries, including theologies," said Dean. Even if their theories don't allow for divine discretion, they need to be respectful of human discretion, he said.

Dean said he can respect the nonbelief of scientists, but "they don't then say we must regard the arts, for example, or other humanistic inquiries as having a power to describe the world as it actually is."

Yet good theology must be compatible with the basic findings of science, Dean maintained.

"I'm opposed to supernaturalism if supernaturalism is propounding theories that are fundamentally incompatible with scientific conclusions," he said. "Theologians are inadequate if they can't generate a picture that takes account of science."

But the converse is also true, he said.

"I think theologians ought to be skeptical of entering into conversations where they're given no authority. It's obsequious. And yet I think that happens regularly."

William Dean is author of *The American Spiritual Culture: And the Invention of Jazz, Football and the Movies.*

William Dean

Quantum Mechanics and the Search for Reality

The *Brittanica* concise encyclopedia describes quantum mechanics as: "The branch of physics that deals with atomic and subatomic systems. It is concerned with phenomena that are so small-scale that they cannot be described in classical terms, and it is formulated entirely in terms of statistical probabilities. Considered one of the greatest ideas of the 20th century, quantum mechanics was developed by Niels Bohr, Erwin Schrödinger, Werner Heisenberg, and Max Born and led to a drastic reappraisal of the concept of objective reality. It explained the structure of atoms, atomic nuclei, and molecules; the behavior of subatomic particles; the nature of chemical bonds; the properties of crystalline solids; nuclear energy; and the forces that stabilized collapsed stars. It also led directly to the development of the laser, the electron microscope and the transistor."

In the preface to his book, *Quantum Reality: Beyond the New Physics,* Nick Herbert notes:

"One of the curious features of modern physics is that in spite of its overwhelming practical success in explaining a vast range of physical phenomena from quark to quasar, it fails to give us a single metaphor for how the universe actually works. The old mechanical metaphor 'The world is a giant clock' condensed in one image the principal features of Newtonian physics—namely, atomicity, objectivity, and determinism. However, physicists today do not possess a single metaphor that unites in one image the principal features of quantum theory."

He continues: "The search for a picture of 'the way the world really is' is an enterprise that transcends the narrow interests of theoretical physicists. For better or worse, humans have tended to pattern their domestic, social, and political arrangements according to the dominant vision of physical reality. Inevitably the cosmic view trickles down to the most mundane details of everyday life."

In the Middle Ages, Dante's picture of the world as a series of concentric spheres was widely accepted and helped justify a hierarchical view of the world that ranged from "the divine right of kings down to the abject obedience of the lowliest serf."

The Newtonian revolution toppled the reign of the concentric spheres and replaced it with a physics of ordinary matter governed by mathematical laws rather than divine command. As a result, says Herbert, the Declaration of Independence reads more like a mathematical theorem than a political document, and "we live today in a largely mechanistic world."

Now modern quantum theory has smashed Newton's clockwork just as Newton shattered the medieval theory of spheres.

"We are now certain that the world *is not* a deterministic mechanism," writes Herbert. "But what the world *is* we cannot truly say. The search for quantum reality is a search for a single image that does justice to our knowledge of how the world actually works."

CTNS, Vatican Observatory Respond to Pope
'Fruitful Concord Between Science, Faith'

Two programs co-sponsored by the Center for Theology and the Natural Sciences in Berkeley, Calif., and the Vatican Observatory delve deeply into questions of Christian theology and quantum mechanics.

The first, a decade-long research collaboration, focused on the theological concept of divine action in relation to the sciences. Scholars involved in the series included cosmologists, physicists, biologists, cognitive neuroscientists and neuroscientists, philosophers of science, philosophers of religion, systematic and philosophical theologians, historians of religion and historians of science.

The series began with a call from Pope John Paul II in 1979 for "fruitful concord between science and faith, between the church and the world." In response, George Coyne, director of the Vatican Observatory in Castel Gandolfo, Italy, organized the first major international conference in 1987 which resulted in the volume, *Physics, Philosophy, and Theology: A Common Quest for Understanding.* This volume includes a message from Pope John Paul II on the need for a fruitful dialogue between science and religion. Based on this, Coyne proposed a major new initiative: a series of five conferences to span the decade of the 1990s. Its goal would be to expand upon the research agenda begun in *Physics, Philosophy, and Theology.*

In 1990, CTNS accepted Coyne's invitation to co-sponsor the series. The resulting five publications focus on the problem of divine action from a particular scientific perspective: cosmology and the laws of nature, chaos and complexity, evolutionary and molecular biology, the neurosciences and the person, and quantum mechanics.

A second collaboration, just underway, is focused on understanding the ways that Christians respond to the challenges of suffering in a world in which God can act.

VITAL Theology

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SPECIAL ISSUE

Resource: www.ctns.org

Robert J. Russell went seven years without drawing a salary to get the Center for Theology and Natural Sciences off the ground in the early 1980s. Today, CTNS's online presence alone is a rich resource for anyone interested in the science-theology interchange.

The "publications" section of the Web site offers a virtual *Who's Who* of the field.

The site provides bibliographies of published resources for basic, intermediate and research levels of interest in the science-theology discussion.

There are easy links to the five texts produced with the Vatican Observatory on the subject of divine action. These are supplemented by descriptions of each of the approximately 150 chapters of the books and grouped by sub-topic.

The real jewel is an extensive collection of interviews, including many in audio and video format. While some of the segments are full-length speeches, you can also learn a lot by watching half a dozen one-minute video clips from theologian Jaroslav Pelikan on the shift from "how" to "why" questions in theology.

Or you can read a Q&A with Richard Dawkins, professor of public understanding of science from Oxford University, who expounds on why humans are nothing more than "gene machines" and why religion is both a "virus" and a "crutch."

Or you can watch a panel discussion on whether the universe had a beginning. Highlights from what was obviously a lengthy discussion have been edited into short, digestible video clips of the most salient points from each of 10 speakers.

There is extensive information about *Theology and Science Journal,* a twice-yearly publication started by CTNS in 2003, and links to three other print publications, *Science and Theology News, Science and Spirit: Exploring Things that Matter* and *Zygon: Journal of Science and Religion.*

Also available is the online *Interdisciplinary Encyclopaedia of Religion and Science.* Originally published in Italian, the Web version of the encyclopedia translated into English was co-funded by CTNS.

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theological wisdom
when it matters most

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