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The Forming of a Partnership: The John Templeton Foundation and Canyon Institute for Advanced Studies

By Debra Fisher

Throughout history, humankind has measured its progress in accordance with the vision and values of individual leaders of particular times and places. Yet our current period in history, with all of its advances in science and technology, empowers today's leaders to press the boundaries of time and place in order to influence humanity on a global scale. Through the deeds of one such contemporary leader, people of various backgrounds are expanding their definitions of human progress and their appreciation of the power of philanthropy.

Sir John Templeton's first major philanthropic endeavor was the establishment of the *Templeton Prize for Progress in Religion* in 1972, and in 1987, he formed the John Templeton Foundation (JTF). In that same year, Templeton was knighted by Queen Elizabeth II for his numerous philanthropic efforts, including his endowment of Templeton College, Oxford.

In 2001, those associated with the Templeton Prize for Progress in Religion renamed the famous Prize to reflect an even greater vision. For many years, they had been looking for ways to draw greater and greater attention to the idea that progress in spiritual information and spiritual discoveries is just as feasible as progress in medicine, science and cosmology. In fact, Sir John Templeton was of the belief that spiritual progress may be more important than all of these other areas. Therefore, the name of the Prize was changed to inspire greater attention to research or discoveries of a spiritual nature. The new name is the *Templeton Prize for Progress Toward Research or Discoveries about Spiritual Realities*. Spiritual realities refer to matters of the soul that are universal and apply to all cultures and all peoples. Examples would include subjects like love, purpose, infinity, prayer, and thanksgiving. These realities are non-material, transcendent or metaphysical areas about which many people have intuitive perceptions.

Within days of the tragic loss of human life in the U.S. on September 11, 2001, representatives of Canyon Institute for Advanced Studies (CIAS) met with Sir John Templeton and his son, Dr. John Templeton, Jr., M.D. (President of the John Templeton Foundation), to explore how the two organizations might work together to bring ideas and cultures together in a meaningful way to enhance humanity's well being. Soon thereafter, the uniting of the two organizations unfolded for the purpose of administering the *Templeton Prize for Progress Toward Research of Discoveries about Spiritual Realities*, and CIAS became the administrator of the prize under the direction of Barbara Small.

Barbara Small, executive manager of Canyon Institute for Advanced Studies and executive director of the Templeton Prize, was one of those who gathered to meet on that fateful September day. "That afternoon is still such a vivid memory

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From the Director's Desk



When I consider the thoughts in the minds of those who came alongside me to form Canyon Institute for Advanced Studies in 2000, I remember the hope. We had great hope of creating a Christian institute that would bring together scholars and artists from various disciplines for the purpose of opening up avenues of expression for the fullness of Christian community to be realized—in our midst and beyond our reach.

We envisioned how experiences of inspiration and learning could co-mingle through various programs of research, interaction and dialogue to affect the world around us. We imagined a future that would call forth new expressions of faith and unique worship encounters through which to celebrate the wisdom of the ancients—those who dared to walk with the confident assurance that what they hoped for was going to happen.

Rev. Dr. Sorensen's letter of appreciation caused me to reflect on those early days of great hope. And in that reflection, my own deep appreciation of the many individuals and organizations that we have been privileged to collaborate with throughout the years was reaffirmed. As this academic year comes to a close, I remain hopeful that you, too, will write to share how your encounters with our programs or materials have impacted you and your community.

Bill R. Williams
Director

Dear Editor,

I want to express my appreciation for Peter Flint's article on the Dead Sea Scrolls (Vol. IV, Issue 1). Dr. Flint's careful analysis of the texts for Psalm 22:16 provided a vivid example of the ways that these ancient texts validate the extreme accuracy of the ancient Scriptures. As a pastor/teacher, I am always amazed how archeological discoveries, such as these Scrolls, have been tools from God to help us not only challenge past skepticism about the reliability of the Biblical text, but more importantly, to help us mine even deeper the rich treasures of God's holy Word.

Dr. Flint's comparison of the manuscript counts from the Qumran people and the Old Testament quotes in the New Testament was fascinating, particularly in confirming the popularity of the Psalms then and now. I am sure that Martin Luther's re-visioning of worship and hymnody flowed in part from his intensive study, translation, and teaching of the Psalms, which he lauded as a "Little Bible" wherein "everything contained in the entire Bible is beautifully and briefly comprehended" (Preface to the Revised edition of the German Psalter, 1531). He pursued the most ancient Hebrew texts, which unlocked the message of God's grace in the Psalms, as did his later exegesis of Romans in the original Greek text.

I congratulate your efforts and hope that you will continue to expose us to discoveries and emerging thoughts of those like Dr. Flint.

Gratefully,

Rev. Paul Sorensen, Ph.D.
Executive Pastor, Community Church of Joy
President, Joy Leadership Center

We welcome letters of up to 200 words. They may be edited for clarity and length. Letters selected for publication may be published or distributed in print, electronic or other forms. Please mail your letters to: Canyon Institute for Advanced Studies, 3300 West Camelback Road, Phoenix, AZ 85017 USA.

Genesis and the Big Bang

By Dr. Rogier Windhorst

This article is an excerpt from a lecture presented by Dr. Rogier Windhorst as part of Canyon Institute for Advanced Studies Public Lecture Series. Dr. Windhorst is Professor of Physics and Astronomy at Arizona State University and deeply involved in the Hubble Space Telescope imaging and analysis. His complete lecture, with photographs and supporting data, is available on DVD. The images and detailed charts may be viewed at <http://canyoninstitute.org/resources/lectures/Windhorst.pdf>. A special thanks to Mr. Jim Armstrong for providing valuable editing assistance in preparing this article for publication.

Today, the scientific evidence for the "Hot Big Bang" birth of the universe is overwhelming. The universe has clearly been expanding from its earliest beginnings (and will continue), critical astronomical distance measurements are now secure to

within a few percent, and the universe's age is accurately placed at 13.7 ± 0.2 billion years.

The vast majority of astronomical measurements involve light that has been in flight toward us much longer than suggested by a 6000 year timescale based on a 24-hour creation day reading of Genesis. Time and distance are inextricably linked in such measurements, so a look at how cosmology-scale times and distances are measured is in order.

Proper Motion. The distances to stars near the center of our own Milky Way galaxy are measured by "proper motion," their movement in relationship to a background of more distant stars. The relatively rapid movements of stars, dust clouds and water molecules nearest the black hole center of our galaxy can clearly be observed. The distance, accurately measured in the

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infrared and radio wavelengths, is about 20,000 light-years (the distance light travels in 20,000 years).

Kepler's Third Law. In 1999, the distance to relatively nearby galaxy NGC 4258 was measured accurately for the first time at 23.5 ± 1.0 million light-years, using a very large radio telescope array. Kepler's Third Law of orbital motion [which accurately and simply relates orbit size to orbital period] was central to this determination. To challenge the correctness of this distance would challenge Kepler's Third Law, derivable from Newton's Law of Gravitation and validated in every satellite and space probe launch.

Hubble Expansion. The discovery of universe expansion and the Big Bang origins came as the answer to a strange puzzle. In the 1920s, astronomer Edwin Hubble observed that the light spectrum of virtually every distant galaxy was shifted toward the red, a curious finding that meant that nearly every galaxy is moving away from every other galaxy! Moreover, the more distant (fainter) the galaxy, the faster it was moving away and with a speed that varied proportionally with distance.

Hubble was the first to realize that this discovery meant that our universe is expanding in all directions. The distance between galaxies increases in the same way raisins move away from one another in an expanding lump of bread dough. It also meant that the universe had a clear singular point of origin, the Big Bang.

The Hubble telescope gave us a very accurate value for the Hubble Constant, the number that mathematically links distance and speed of expansion, and the inverse of this constant yields yet another approximate estimate of the age of the universe at 15 billion years.

Relativistic Time Dilation. Supernovae are exploding stars, and the more distant ones recede at a meaningful fraction of the speed of light, allowing us to measure a distinctive effect called relativistic time dilation. This essentially means that clocks run slower for these distant and rapidly moving events. The rise and fall of light output from supernovae is fairly well known, typically taking about 60 days to drop to about half of the peak luminance. At large distances, supernova luminance rise and fall times are measurably longer, confirming universe expansion and the Big Bang model.

Cosmic Microwave Background Radiation (CMBR). One of the most precise measurements ever made mapped microwave energy created when the universe was less than one million years old. At this age, the temperature had dropped sufficiently for newly formed protons and electrons to begin forming the first atoms of hydrogen and helium. The distinctive energy of this era was imaged using the Cosmic Background Explorer and the Wilkinson Microwave Anisotropy Probe launched in 2001, yielding a universe age of 13.7 ± 0.2 billion years.

Light Element Production. The Big Bang model predicts that 23% of the mass of conventional matter in the universe should be helium and the rest hydrogen. Other elements are present, but in negligible percentages. An analysis of any arbitrary star

or gas cloud, whether far or near, shows 23.5% of all the atoms to be helium and nearly all the rest hydrogen, another confirmation of the Big Bang understanding of the universe's beginning.

Despite all of these discoveries (and many more), there remains much we do not know. One particularly humbling result, from the CMBR measurements, is an estimate of the total amount of matter and energy in the universe. The unsettling result is that matter and energy as we know them comprise only about 4.4% of that total. The rest, referred to as dark matter and energy, is enigmatic; we know it's there, but we know virtually nothing about it.

Genesis and the Beginning. This big picture compares well with the biblical account of creation. On the first day, light is created; not the sun, but light, ... the pure energy of the Radiation Era, along with the associated laws of physics. The initial conditions were thereby set for the universe to expand and evolve as it evidently did. Anything else would have produced a different universe than we observe.

The second day saw a separation of the "waters from the waters." Expansion of the universe is underway, and the waters under the firmament will become the waters of the earth separated by land. With some latitude in interpretation, the upper waters may describe the gas clouds out of which galaxies (and stars and planets) will form. With no 24-hour rotations involved in the first and second creation day, there is no basis for assuming that these periods are constrained to 24 hours.

Plants appear on the third day, before the fourth day's "lights in the firmament of the heavens," seemingly out of sequence. But viewed from the earth, the order might not be a contradiction because the earth's atmosphere was likely opaque for much of the first million years. It might therefore have been possible for early plants to develop if enough other radiant energy warmed the earth.

Ultimately, we humans have been created with an ability to understand much of the development of the universe. Psalm 8 reminds us that we are created in the image of God. We should therefore use our gifts of intellect and creativity to study the universe, but with humility because there are limitations to our understanding. In the first 10^{-43} seconds of time, the laws of physics themselves predict their own break down. We have no idea what was possible then, and the possibility of God being there, as the author, is not ruled out. Like the US constitution, the laws of physics do not require, but instead allow us to have a faith which is more suited for engaging matters like good and evil, love and beauty.

There would be little hope if we had to understand the laws of physics, all the mathematics, and every detail of how the origins of the universe really worked. But the "I AM" that made the universe as He saw fit reveals part of Himself in Creation and part of Himself in the Bible to lead us to Jesus who was the perfect embodiment of Himself. We make a grave mistake when matters such as Genesis and evolution are debated in a way that turns away people from this gospel.

The Forming of a Partnership: The John Templeton Foundation and CIAS

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for me,” explained Small. “We were sitting around the table with Sir John Templeton when he received word that his interview about the potential global economic impact of the attacks on America was about to air. Someone turned on the television. Our eyes were glued to the televised images as we listened closely to the previously recorded wise words of the man in whose physical presence we sat. The moments seemed to be captured in our collective minds like flashbacks that we would revisit for lifetimes.” In the following month, October 2001, the official partnership between the JTF and CIAS was formed.

How does Canyon Institute for Advanced Studies purpose and interests unite with the John Templeton Foundation and the Prize? CIAS is a Christian interdisciplinary research center that brings together minds and resources to investigate and research issues emerging from new discoveries and advances for the purpose of better understanding their implications in the common ground of faith and discipline. Focused on developing insights that lead to a more integrated worldview, CIAS disseminates information and perspectives to assist people of faith in the global community in developing sound, coherent, and informed foundations for engaging exciting opportunities. Both JTF and CIAS are organizations with a deep respect for different religions and worldviews. CIAS affirms the goals of the John Templeton Foundation, which, like the goals of most open-minded scholars, are best met by fostering as free a marketplace of ideas as possible.

Executive Director Small explained that the deadline for nominations for the *Templeton Prize for Progress Toward Research or Discoveries about Spiritual Realities* is in July of each year. “We encourage nominations that meet the criteria of the Prize,” said Small. “There is a lot of undiscovered potential in the global community that would be of great interest to our interfaith team of judges.” Those interested in nominating a person for the 2006 Prize can get detailed information on the nomination process by accessing the Templeton Prize Web site at: www.templetonprize.org. The Prize is the world’s largest single monetary award (£795,000 or \$1.5 million), surpassing that of the Nobel Prize.

On May 4, 2005, Charles Townes was joined by his wife, Frances Townes, and two of his daughters and their spouses at Buckingham Palace as HRH The Duke of Edinburgh Prince Philip presented him with the 2005 Templeton Prize.

“I feel very humble at being thought to have contributed to such critically important fields as spirituality and the purpose of life,” said Townes. “I believe there is no long-range question more important than the purpose and meaning of our lives and our universe, and Sir John has very much stimulated its thoughtful consideration, particularly encouraging open and useful discussion of spirituality and the meaning of life by scientists.”

Indeed, it can be said of Sir John Templeton that he is pressing the boundaries of time and place in order to influence humanity—for the good—on a global scale.



Dr. John M. Templeton, Jr., M.D., 2005 Templeton Prize winner Charles Townes and Barbara Small, Templeton Prize Executive Director and CIAS Executive Manager in New York City.

2005 Prize Winner: Charles Townes

“I believe there is no long-range question more important than the purpose and meaning of our lives and our universe.”

When Charles Hard Townes suddenly figured out how to tame microwaves and, in the process, set the foundation for the development of masers and lasers, it changed the modern world. But, for Townes, who would go on to win the Nobel Prize in Physics for his realization that day, it was also a moment that spoke to a larger truth, about how the power of revelation—not unlike that recorded in the scriptures—evidences the similarity of science and religion.

In 1951, Townes, along with many other physicists, was attempting to figure out ways to use microwave spectroscopy to better examine molecular structure. As part of his research, he chaired a Navy-sponsored committee that sought to encourage research that might result in generation of waves shorter than those of current radar systems. It was a goal that had proven frustratingly elusive to Townes and like-minded researchers.

Early one spring morning before a committee meeting in Washington, D.C., Townes arose early but, finding the hotel restaurant not yet open, went outside and sat on a bench in Franklin Square. Alone on the bench, Townes wrestled with his research questions when, like a bolt from the blue, a solution popped into his head, which he quickly jotted down on a piece of paper.

That moment of revelation has been cited repeatedly by Townes during the past half century as a crystallization of how topics normally associated with religion or science—revelation, intuition, observation, faith, and aesthetics—can easily apply to both disciplines. Ironically, the bench where Townes con-

2005 Prize Winner: Charles Townes

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ceived his groundbreaking insight was across the street from the site where Alexander Graham Bell experimented with sending messages on beams of light.

Townes' discovery would lead to the first working maser in 1954 and soon after, in collaboration with brother-in-law Schawlow, to the invention of the laser. In 1955, Townes and Schawlow co-authored the influential book, *Microwave Spectroscopy* and, in 1960, the two shared a patent for the laser.

Four years later, in 1964, Townes received the Nobel Prize in Physics, along with two physicists from the Lebedev Institute in Moscow, Aleksander Prokhorov and Nikolai Basov, for "fundamental work in the field of quantum electronics which has led to the construction of oscillators and amplifiers based on the maser-laser principle."

A major turning point in Townes' career came that same year, when members of the men's Bible study group at Manhattan's Riverside Church asked him to speak on the relationship between science and religion. Townes later recalled that he was selected for the talk because he was the only scientist they knew who regularly attended church. It was to be a turning point in the nascent movement to understand where these two disciplines might intersect.

Townes holds more than two dozen honorary degrees and a trove of awards and honors. Now 89, a father of four and grandfather of six, he continues a vigorous schedule equal to the demands of his chosen path of inquiry, lecturing, writing and serving as Professor in the Graduate School at the University of California at Berkeley. He and his wife of 63 years reside in Berkeley.



Public Lecture Series Audio and Video Recordings

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 * Dr. David F. Siemens, Jr.
 * Dr. Norbert Samuelson
 * Dr. Jeffrie Murphy
 * Dr. Fred Hickernell
 * Dr. Mary Puglia/Rev. Carl Alzen
 * Mr. Charles Roberts
 * Dr. Bill Williams/Mr. Mark Dickerson
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 * Dr. Douglas Kelley
 Dr. Peter Flint
 Dr. David F. Siemens, Jr.
 Dr. Margaret Towne
 Dr. Rogier Windhorst

Topic

Ethics in a Pluralist Society
Ultimate Foundations of Ethics: Beyond Values, Rules and Denial
Implications of Evolutionary Psychology for Jewish Ethics
Vengeance, Justice and Forgiveness
Treasures of the Sand: God's Gift in Scripture & Modern Technology
Revelations of the Human Genome Project
Isaac Newton: Dissenter and Hermetic Philosopher
A Mathematical Analogue for a Model of the Trinity
Christian Higher Education Praxis in a Trinitarian Presence
Do We Live in a Right Stuff Universe: The Roots of the Design vs. Naturalism Debate
The Cross and Creation
The Icy Galilean Satellites
Life and Meaning in the Cosmos
Origin of the Moral Law
Cosmology and Creation
Gaps Matter
Historical Christianity and 21st Century Science: The Theology of SS. Augustine and Vincent of Lerins as a Fruitful Way of Reconciling Science and Religion
New Scientific Technologies Reveal the Secrets of the Dead Sea Scrolls
Genes, Genesis and God
Finding a Footing on a Slippery Slope: The Ethics of Embryo Cell Research
Biocultural Evolution in the 21st Century: The Evolutionary Role of Religion
Conflicts and Confederacies between Mathematics and Christianity: Parables for our Road Ahead in Science and Technology
Interpersonal Forgiveness: Forgiving for Life
The Dead Sea Scrolls and the Bible: New Evidence from Ancient Texts
What Philosophers Don't Seem to Know about Knowledge
Genesis and Evolution: Integration
Genesis and the Big Bang

Historical Christianity and 21st Century Science: The Theology of St. Augustine as a Way of Reconciling Science and Religion

By Charles Roberts

Charles Roberts received his degree in European intellectual and cultural history from Claremont Graduate University. He has taught Renaissance and Reformation at Grand Canyon University.

Since antiquity Christianity has had to come to terms with a variety of philosophical systems. As early as the second century, the Church found the need to reconcile Hellenistic natural philosophy (science) with Scripture and the Deposit of Faith (*depositum fidei*). We tend to forget, despite popular belief to the contrary, that a very literal reading of Scripture is no more compatible with the astronomy of Ptolemy than it is with that of Copernicus. Apparent and real conflicts between science and religion have always existed and did not begin with the seventeenth-century scientific revolution. While the conflict paradigm of the “war between science and religion” is an erroneous caricature of the historic relationship between science and religion, it does contain an element of truth. The debate over intelligent design, creationism and evolution, for example, illustrates the tension that can sometimes exist between faith and science. This debate and the proper relationship between science and religion, however, could be resolved by following the solution Galileo proposed to his ecclesiastical opponents at the birth of the modern scientific revolution.

In his *Letter to the Grand Duchess Christina*, Galileo defended himself against critics who argued that the astronomy of Copernicus contradicted the clear teaching of Scripture. To support his case, Galileo appealed to what he call a “most useful doctrine” of St. Augustine, found in his commentary on the six days of creation, *The Literal Meaning of Genesis*.

One important exegetical problem Augustine faced in writing his commentary on Genesis was reconciling a literal interpretation of the six days of creation with the teachings of natural philosophy. Augustine believed that one’s faith had to come to terms with scientific knowledge. It was this conviction that was partially responsible for his loss of faith in the Manichean religion. In the *Confessions*, Augustine, recalled that when he had compared the findings of ancient Greek science with the “long-winded fables” of Manes he came to the conclusion that the natural philosophers were more reliable. “I was commanded to believe,” Augustine said, “yet it did not harmonize with the principles I had arrived at by mathematics and indeed by my own eyes.” Augustine was to run into similar religious obscurantism from some of his “weaker brethren” after he became a Catholic. However, he found in the Church’s tradition an approach to Scripture that could accommodate both the truth of revelation and reason.

Crucial to understanding how Augustine approached Genesis are his principles of exegesis. Like all of the Church fathers, Augustine believed that biblical text was multi-dimensional and

must be read in light of the Church’s Rule of Faith (*regula fidei*). The literal sense of Scripture, according to Augustine, is “what the author intended.” The literal sense of a particular text may consist of a word-for-word correspondence to reality (e.g. “Jesus was raised from the dead”). However, at other times the literal sense may be clothed in highly figurative language. Such was the case with the creation account. It is this definition of the literal sense of Scripture that strikes modern readers as resembling allegorical interpretation. Thus, for Augustine, the literal meaning of the words “let there be light” in Genesis 1:3, does not refer to the creation of physical light, but the enlightenment of intellectual (angelic) creatures.

In offering his interpretation of Genesis, Augustine’s views were challenged by Christians who held an extremely literal view of Scripture. In reply Augustine set forth several important principles of exegesis. One was that any interpretation of Scripture should not detract from God’s transcendent character and majesty. Therefore, crudely literal interpretations, such as God forming man directly from the earth, are incompatible with God’s nature and majesty. For Augustine “to think of God as forming man from the slime of the earth with bodily hands is childish. Indeed, if Scripture had said such a thing, we should be compelled to believe that the writer had used a metaphor.”

Another principle was that any interpretation of Scripture could not contradict *proven* scientific knowledge. Augustine made a crucial distinction between reconciling the proven facts of science with Scripture versus speculative scientific theories. When natural philosophers and mathematicians, based upon reliable evidence, are able to prove some fact of physical science, then the duty of the theologian is to harmonize this knowledge “with the Catholic faith.” For faith to be credible it must not conflict with empirically and rationally obtained scientific knowledge. It is, however, the *proven facts* of natural philosophy that Augustine believed must be reconciled with Scripture, not theoretical and metaphysical conjectures such as the eternity of matter.

The above principles form the core of Augustine’s “most useful” doctrine that Galileo saw as the key to understanding how science and religion truly relate to one another. How then can these principles help resolve the debate within Christianity over origins—whether it is theistic evolution, intelligent design or scientific creationism? We can begin by realizing that evolutionary or developmental views of creation go back to antiquity and do not originate in the nineteenth century. In *The Literal Meaning of Genesis*, Augustine taught a developmental view of creation. This is not to say, however, that Augustine was an early fifth century precursor of modern evolutionary thought.

One of the most distinctive ideas found in *The Literal Meaning*

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Historical Christianity and 21st Century Science

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of *Genesis* is Augustine's teaching on simultaneous creation. This idea in many ways is the cornerstone of Augustine's understanding of the creation account. For Augustine the "days" of creation are not six 24-hour days, but rather are categories used for didactic purposes to summarize and explain the cause of events in creation that occurred simultaneously.

Eternity for Augustine was a non-temporal idea. Eternity is timelessness, existence outside of time. God did not create *in time*, rather he created time itself. This was one of the reasons Augustine rejected the idea that God created the world in six literal days. The ancient Greeks believed, as did Augustine, that the essence of time was change. Therefore God, who is unchangeable, must of necessity exist above time. Augustine, the Church fathers, Philo and most ancient rabbinic commentators believed that time had a beginning. It was one of the works of creation. This ancient Judeo-Christian belief resembles one of the implications of Big Bang theory (i.e., time had a beginning).

Augustine also recognized that a cursory reading of the biblical text revealed that whatever these "days" were, they could not be a 24-hour period of time, since the sun and the moon were created on the "fourth day." Why then does *Genesis* record that the "days" of creation were six in number? Augustine believed that God had "ordered all things in measure, and number, and weight" (Wisdom 11:21). Nature revealed that God had structured the universe in mathematical and geometrical harmony. There are six "days" of creation because six is a mathematically "perfect" number (i.e., a number that is sum of its aliquot parts), which figuratively represents the unfolding and mathematical harmony of the cosmos. God also used the image of six days as a way of adapting to the limited capacity of the mind in comprehending that creation is the product of a single simultaneous act as well as explaining the order of causality in creation.

Intimately tied to Augustine's belief in simultaneous creation was his concept of "seminal reasons" (*rationes seminales*). When God created the entire cosmos in one moment, he did not create the cosmos fully formed but instead created all things in their "seminal reasons" which would make their successive appearance in time as the cosmos developed. The idea of *rationes seminales* is also directly related to the Augustinian concept of natural law. The *rationes seminales* are "numbers" (i.e., formative principles or laws) implanted in matter by God at the moment of creation. At the time of creation, God created the primordial seeds (*rationes seminales*) of all living things to come, whether animal, vegetable or Adam's body. Many of the works of creation were made invisibly and potentially to make their appearance in time as it unfolded. God created all things either actually (such as space, time, matter and energy) or potentially (sun, moon, plants, animals, etc.) at the moment of creation. The universe was therefore created complete and perfect in a single moment. Due to the completeness of this one great creative act, God in one sense no longer creates any new creatures. However, Augustine goes on to say that in creating most of the universe in potentiality, God was providing for the development

of new creatures as time unfolded.

Augustine's literal reading of *Genesis* demonstrates that it is possible to harmonize the concept of evolution with the teaching of Scripture. It might be said that Augustine's evolutionary theory bears little resemblance to current theories of evolution. Augustine's theory, for example, does not posit biological transformism or "deep time." In fact, Augustine believed that development of the *rationes seminales* took place over a very short period of time. To acknowledge that Augustine's evolutionary interpretation of *Genesis* does not replicate modern cosmological and biological theories does not detract from its significance in helping to clarify, if not resolve, many of the current debates among Christians over evolution, origins, science and faith. The terms of the debate, for example, would improve immeasurably if some Christians would stop equating evolution solely with either Darwinian theories or purely naturalist and materialist interpretations. As Stanley Jaki, a priest and historian of science, correctly observes: "the real threat of Darwinism to the Bible has never been its evolutionary perspective.... That Darwin failed to explain what that instrumentality consisted of was obvious to any clear-sighted reader of the *Origin of Species*.... The only solid ground for holding evolution is belief in the createdness of the universe, and therefore in the strict interconnectedness of all its parts, a feature demanded by the infinite rationality of the Creator."

The misunderstanding between the respective roles of science and theology is not limited to scientific creationism. There are some theistic evolutionists, for example, who reduce the creation account to a mere mytho-poetic symbol. Some of these interpretations significantly modify or reject core teachings of historic Christian orthodoxy such as original sin, the fall and origin of the soul. In this case, theology is determined by scientific theories that are either unprovable or metaphysical in nature. This is especially seen in the work of process theologians. Their portrait of a non-interventionist, changeable deity, who is neither fully omnipotent nor omniscience is not the God of the Nicene Creed. Augustine's literal commentary on the creation account and the principles he sets forth demonstrate that one can uphold the traditional doctrines of the Deposit of Faith while at the same time hold a rich and complex interpretation of *Genesis* that takes the biblical text seriously without falling into a wooden literalism.

Augustine reminds his readers that the creation account was not exhaustive. God revealed only as much as was necessary for our salvation. "Not everything has been written to tell us how time unfolded after the first creation of things," that which is not revealed can only be known, if at all, through reason.

Augustine was convinced that the objective truth of revelation and science complement each other. It is this conviction that Galileo also shared with Augustine. It is the reason that both men—the scientist and the bishop—were moved by Ambrose's hymn, *Deus Creator Omnium*, with its song of praise to the God who called into existence the marvelous works of creation.

Canyon Institute for Advanced Studies is

A Christian interdisciplinary research center, bringing together minds and resources to:

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

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