

FAITH SCIENCE & REASON

THEOLOGY ON THE CUTTING EDGE

REDISCOVERING FAITH ON THE FRONTIERS OF SCIENCE

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MCGILL-TOOLEN CATHOLIC HIGH SCHOOL
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"Scientia Pro Amore Dei"
(Knowledge for the Love of God)



MIDWEST THEOLOGICAL FORUM

Chapter Three

The Big Bang about Creation: Is Sacred Scripture Anti-Science?

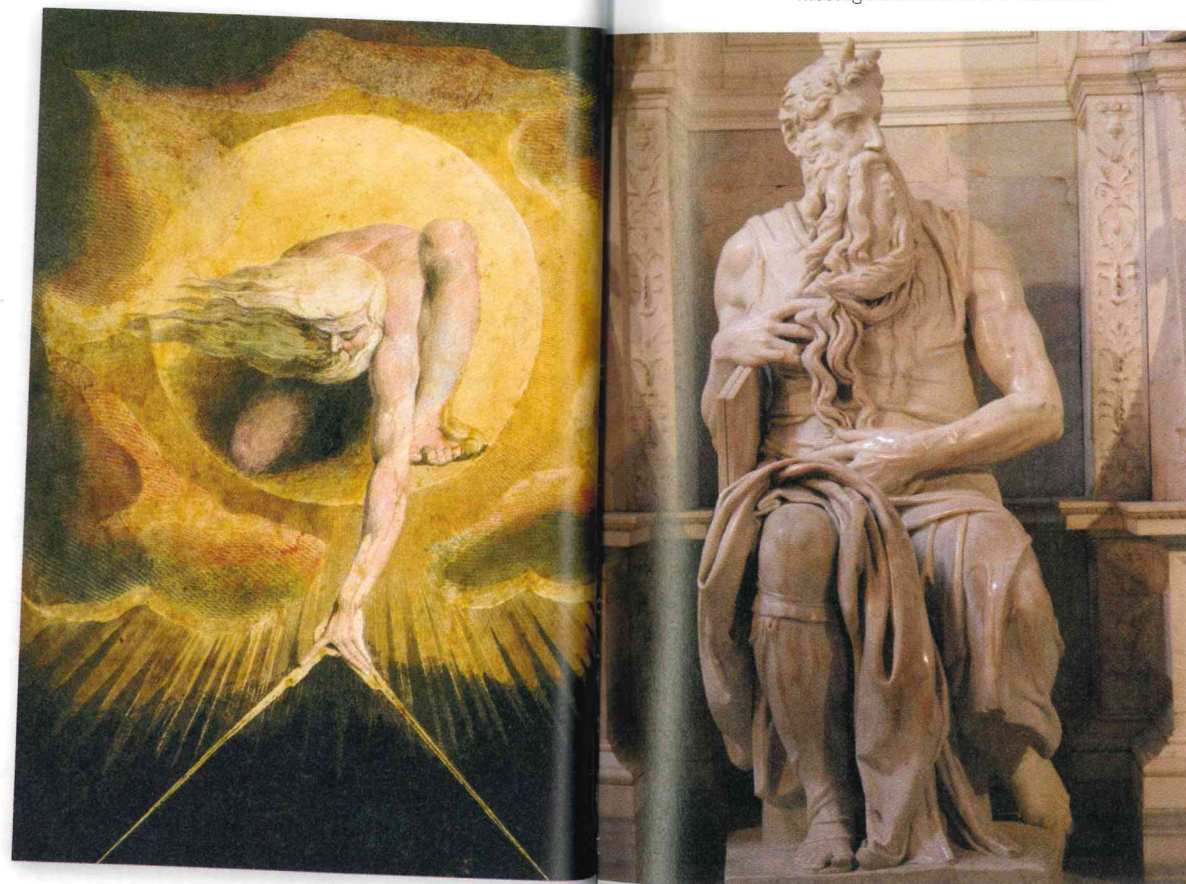
A. The Bible: God Reaching Down, Humanity Reaching Up

For a Christian, there can be no doubt about the importance of the Bible. From the very beginning of the Church's history, Sacred Scripture has always been recognized and revered as the Word of God. The *Catechism of the Catholic Church* strikingly formulates the importance of Sacred Scripture for faithful believers, comparing its veneration to that of the Eucharist, which is nothing less than Jesus Christ himself: "The Church has always venerated the divine Scriptures as she venerated the Body of the Lord: *both* nourish and govern the whole Christian life [emphasis added]."¹ A perfect illustration of this truth can be seen at Mass, during which only two things are raised up by the priestly minister: the consecrated Host, and the Book of the Gospels.

Therefore, like the Eucharist, Sacred Scripture is divine. And yet the Eucharist is not simply divine; it is also a human reality. Jesus Christ, who is really present in the Eucharist, is the Word who became flesh. He is fully God and fully human, a unity of both in his one Divine Person. It should not surprise us, then, that the Bible is fully human also—it has God as its Author, but he is its Author only through human instruments: "God is the author of Sacred Scripture because he inspired its human authors; he acts in them and by means of them."² God "writes" the Bible by divinely inspiring

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"And the Lord God said, 'Let there be light';
and there was light." (Genesis 1:3)



THE BIBLE REFLECTS TWO HISTORIES
AT ONCE: IT IS THE HISTORY OF GOD
REACHING DOWN TO HUMANITY, AND
IT IS HUMANITY REACHING BACK,
STRIVING TO UNDERSTAND AND LIVE
ACCORDING TO THE TRUTH THAT
GOD REVEALS.

Moses the teacher and lawgiver, one of the
many to whom God entrusted his fully divine
message found in the Old Testament.

members of his People to write it. And this means that the Bible reflects a long human process—it has a history.

Joseph Ratzinger, now Pope Benedict XVI, once put it this way:

... Scripture is not a meteorite fallen from the sky ... Certainly Scripture carries **God's thoughts** within it; that makes it unique and constitutes it an authority. Yet it is **transmitted by a human history**. It carries within it the life and thought of a historical society that we call the "People of God."³

The Bible reflects,⁴ therefore, two histories at once: it is the history of God reaching down to humanity with his truth and his saving grace, and it is humanity reaching back, striving to understand and live according to the truth that God reveals. In regard to God's reaching down, Sacred Scripture is *inerrant*—the writings it contains "teach without error his [God's] saving truth."⁴ As the Second Vatican Council clearly affirmed, "we must acknowledge that the books of Sacred Scripture *firmly, faithfully, and without error* teach that truth which God, *for the sake of our salvation*, wished to see confided in the Sacred Scriptures [emphasis added]."⁵

But because the Bible is also the history of his People reaching back up to him, God's truth is transmitted through the concrete conditions of God's People in their own history: their level of learning, "the conditions of their time and culture," even their own style of writing.⁶ This is why the Bible requires interpretation; above all, so that what God wants to reveal for our salvation is clearly understood even though the writings through which it comes to us are from a culture quite different and distant from our own. As the *Catechism* notes, "What comes from the Spirit is not fully 'understood except by the Spirit's action'"⁷—God's help is needed to make a correct interpretation of Sacred Scripture.

This important fact, that Scripture is divine and human, the divine Word in human words, must guide us as we approach the relationship of science and Sacred Scripture, and in particular as we approach the biblical accounts of creation found in the Book of Genesis and other parts of the Bible. This will help us avoid two opposite errors that lead to dead-ends and misconceptions. The first error is scientific creationism, which defends the divinity of God's Word, but loses sight of its humanity. The opposite error, popular with those who embrace materialism, reductionism, and scientism, sees only the human aspects of the Bible and therefore dismisses it as the product of pre-scientific ignorance. If we instead take an approach that respects both the human and the divine elements of Sacred Scripture—with the understanding that the divine truth comes to us *through* the human—we will understand Scripture properly and see that its truth allows us, and indeed encourages us, to be open to modern scientific insights.

If we take a “both/and” approach, respecting both aspects of Scripture, we will really understand it and understand how its truth is not a barrier to our openness to modern scientific insights. A “both/and” approach means embracing all three of the following points:

- 1) The Bible tells us, without error, all we need to know for the sake of our salvation about the world God created;
- 2) The Bible tells us this truth using language and images about the physical world that are not scientific; *and*
- 3) The way in which this truth is transmitted in the Bible has something to teach us.

Keeping this in mind, we should not expect from the Bible the precise scientific description of the world’s origins that only became possible once modern scientific approaches were developed. Yet, for all the conditions that are natural to its human character, Scripture, as God’s Word, truly contains a saving message about creation that remains valid for all time. Moreover, that message, by elevating our minds and teaching us to value both the world that God made and the spiritual intellect with which God endowed human beings, helped Western civilization to give birth to a scientific approach to the world.

To consider Sacred Scripture in relation to modern science we must go back to Genesis 1, the very text that has provoked so many of the debates on this issue. There we find an account of the beginning of the world and the origin of its creatures, including man, an account in which the creation of all things is completed by God in less than a week—six days, to be exact. Is this story, and the Bible as a whole, anti-scientific? Does it stand as a barrier to believers who wish to embrace the valid insights of modern science regarding the age of the universe and other crucial points? Or is there something that is being missed in the noisy debate over it?

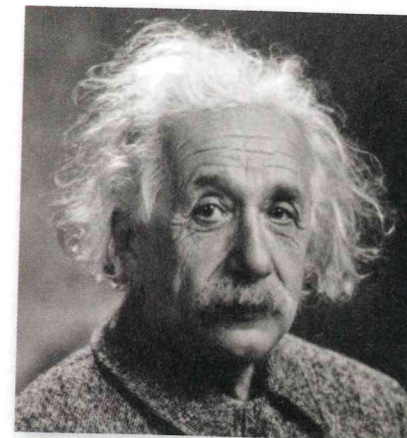
To answer these questions about Genesis 1 is to answer the question of the whole relationship between God’s Word and modern science. Let us begin by going to the creation accounts themselves—“accounts,” not “account,” for as we shall see later, there are several creation accounts in Sacred Scripture.

WE SHOULD NOT EXPECT FROM THE BIBLE THE PRECISE SCIENTIFIC DESCRIPTION OF THE WORLD’S ORIGINS THAT ONLY BECAME POSSIBLE ONCE MODERN SCIENTIFIC APPROACHES WERE DEVELOPED. YET IT TRULY DOES CONTAIN A SAVING MESSAGE ABOUT CREATION THAT REMAINS VALID FOR ALL TIME.

Galileo Galilei



Albert Einstein



B. “In the Beginning”: The Genesis Story of Creation (Genesis 1:1—2:4a)

The first creation account in Genesis is a piece of literature that is familiar to many people but is not often studied with care and attention. It must be read closely and in full in order to be understood.

CHAPTER ONE

- 1 *In the beginning God created the heavens and the earth.*
- 2 *The earth was without form and void, and darkness was upon the face of the deep; and the Spirit of God was moving over the face of the waters.*
- 3 *And God said, “Let there be light”; and there was light.*
- 4 *And God saw that the light was good; and God separated the light from the darkness.*
- 5 *God called the light Day, and the darkness he called Night. And there was evening and there was morning, one day.*
- 6 *And God said, “Let there be a firmament in the midst of the waters, and let it separate the waters from the waters.”*
- 7 *And God made the firmament and separated the waters which were under the firmament from the waters which were above the firmament. And it was so.*
- 8 *And God called the firmament Heaven. And there was evening and there was morning, a second day.*
- 9 *And God said, “Let the waters under the heavens be gathered together into one place, and let the dry land appear.” And it was so.*
- 10 *God called the dry land Earth, and the waters that were gathered together he called Seas. And God saw that it was good.*
- 11 *And God said, “Let the earth put forth vegetation, plants yielding seed, and fruit trees bearing fruit in which is their seed, each according to its kind, upon the earth.” And it was so.*
- 12 *The earth brought forth vegetation, plants yielding seed according to their own kinds, and trees bearing fruit in which is their seed, each according to its kind. And God saw that it was good.*

- 13 And there was evening and there was morning, a third day.
- 14 And God said, "Let there be lights in the firmament of the heavens to separate the day from the night; and let them be for signs and for seasons and for days and years,
- 15 and let them be lights in the firmament of the heavens to give light upon the earth." And it was so.
- 16 And God made the two great lights, the greater light to rule the day, and the lesser light to rule the night; he made the stars also.
- 17 And God set them in the firmament of the heavens to give light upon the earth,
- 18 to rule over the day and over the night, and to separate the light from the darkness. And God saw that it was good.
- 19 And there was evening and there was morning, a fourth day.
- 20 And God said, "Let the waters bring forth swarms of living creatures, and let birds fly above the earth across the firmament of the heavens."
- 21 So God created the great sea monsters and every living creature that moves, with which the waters swarm, according to their kinds, and every winged bird according to its kind. And God saw that it was good.
- 22 And God blessed them, saying, "Be fruitful and multiply and fill the waters in the seas, and let birds multiply on the earth."
- 23 And there was evening and there was morning, a fifth day.
- 24 And God said, "Let the earth bring forth living creatures according to their kinds: cattle and creeping things and beasts of the earth according to their kinds." And it was so.
- 25 And God made the beasts of the earth according to their kinds and the cattle according to their kinds, and everything that creeps upon the ground according to its kind. And God saw that it was good.
- 26 Then God said, "Let us make man in our image, after our likeness; and let them have dominion over the fish of the sea, and over the birds of the air, and over the cattle, and over all the earth, and over every creeping thing that creeps upon the earth."
- 27 So God created man in his own image, in the image of God he created him; male and female he created them.
- 28 And God blessed them, and God said to them, "Be fruitful and multiply, and fill the earth and subdue it; and have dominion over the fish of the sea and over the birds of the air and over every living thing that moves upon the earth."



- 29 And God said, "Behold, I have given you every plant yielding seed which is upon the face of all the earth, and every tree with seed in its fruit; you shall have them for food.
- 30 And to every beast of the earth, and to every bird of the air, and to everything that creeps on the earth, everything that has the breath of life, I have given every green plant for food." And it was so.
- 31 And God saw everything that he had made, and behold, it was very good. And there was evening and there was morning, a sixth day.

CHAPTER TWO

- 1 Thus the heavens and the earth were finished, and all the host of them.
- 2 And on the seventh day God finished his work which he had done, and he rested on the seventh day from all his work which he had done.
- 3 So God blessed the seventh day and hallowed it, because on it God rested from all his work which he had done in creation.
- 4a These are the generations of the heavens and the earth when they were created.

When one reads this passage closely and carefully, one is able to see both its power and its beauty. But more background is necessary to fully grasp its truth. Some people, who regard themselves as scientific, dismiss this story as a primitive myth, the product of "a Bronze Age desert kingdom." Ironically, they have this dismissive attitude, in many cases, not because they know more history than the theologians do, but because they know far less. They see the apparent human limitations of the men who set down these words so long ago. Yet it is precisely because they do not really understand the human history and the human context in which the story was written that they cannot hear God's voice within it. For if God really acts *in and through* the human, as we noted above, and not merely alongside the human, then one cannot hear the divine voice unless one truly understands the human voice through which it speaks. There is a further irony: the scientific atheist dismisses the Genesis 1 account of creation as myth and superstition, not realizing that it was actually written, among other things, in order to dismiss myth and superstition.

In order to understand this, let us look at the story *behind* the story we just read—a story both human and divine, a story about God's People.

Imagine that you are a Jew, living more than five hundred years before Christ. You are a priest, with a duty of religious leadership

bestowed by God upon your family line, a duty that you take as the primary purpose of your life. Your responsibilities are vital: offering sacrifices, leading the congregation in prayer, and maintaining a close adherence to the Law given by Moses, whom God raised up long ago to lead his People out of slavery in Egypt and into a land flowing with milk and honey—the Promised Land.

But you are no longer living in that land. It has been devastated by an invading empire. You, and all of God's People, have been forcibly removed from it, and have been deported to live in the land of the very empire that took it from you—Babylon. The Temple, the place of God's Presence, has been reduced to rubble. You now have a new duty—you must help your people hold on to their faith in God and to the way of life he gave to them, and you must do it against all odds.

It is in that place, during that terrible time which generations to come will call the Exile, that you first hear these words:

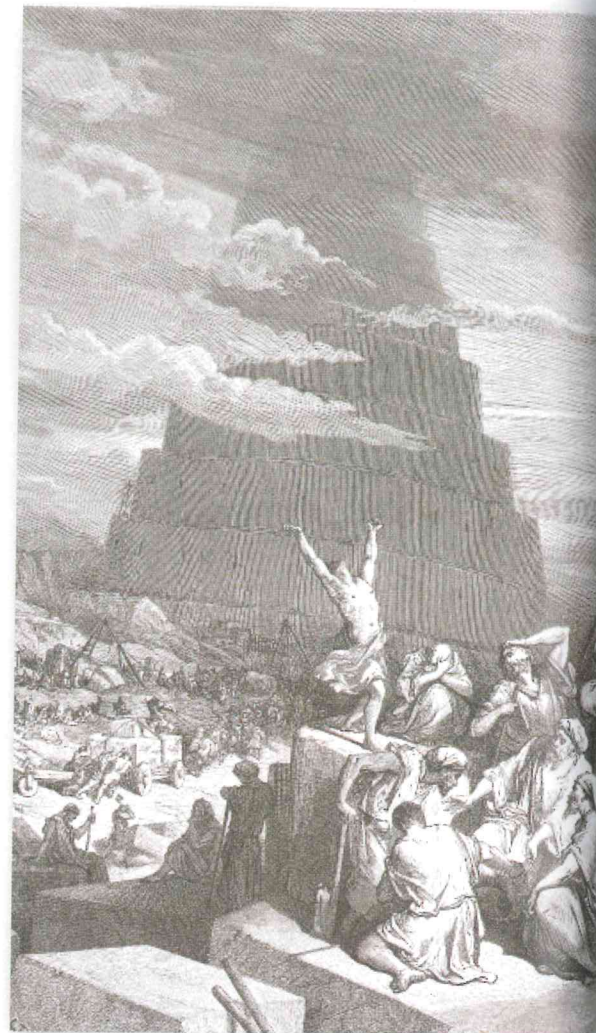
*When in the height heaven was not named,
And the earth beneath did not yet bear a name,
Apsu, Fresh-Water, the Father of the Gods,
And Tiamat, Salt-Water, Chaos, the mother of the Gods,
Mingled their waters together...
Then, in the midst of heaven, the gods were created...*

These words begin the *Enuma elish*, the Babylonian story of the world's creation and the central myth of the Babylonian religion. It begins with a father god, Apsu, and a mother god, Tiamat, attempting to kill their own children. It continues with them being killed by their offspring instead, and with the leader of those offspring, Marduk, making the earth and sky out of his mother's body parts. It ends with Marduk killing the demon Kingu who instigated the murderous plot. As the blood of the demon drips out onto the newly formed earth, human beings are formed out of the droplets. Marduk then makes man to be a slave to all the gods, including the sun-god, the moon-god, and the star-gods.

It is a story of violence and death, filled with deeds that are the polar opposite of the way the one and true God, Yahweh, acts. Slowly, but surely, a response is growing within you and within the other priests to this dreadfully warped picture of divinity and of the origin of man and the universe. Thanks to you, a different story will be heard by the people, a story with a very different beginning: "*Bereshit bara Elohim et hashamayim ve'et ha'arets*"—"In the beginning, God [not Apsu, nor Tiamat] created heaven and earth..."

THE GENESIS 1 ACCOUNT OF CREATION WAS WRITTEN IN ORDER TO DISMISS MYTH AND SUPERSTITION. IN ORDER TO UNDERSTAND THIS, WE MUST LOOK AT THE STORY BEHIND THE STORY—A STORY BOTH HUMAN AND DIVINE, A TRUE STORY ABOUT GOD'S PEOPLE.

The Confusion of Tongues



THE UNIVERSE WAS CREATED BY A GOD WHO IS ONE, WHO IS ALL-POWERFUL, WHO IS PERFECTLY INTELLIGENT, AND WHO IS PERFECTLY GOOD.



C. The Divine Message of the Creation Story

THE PLAIN MESSAGE: GOD, THE CAUSE OF THE COSMOS

Perhaps it is only with the bloody events of the *Enuma elish* still floating in our minds that we can best interpret all of the amazing details of the Genesis account of creation. In this beautiful picture of the origins of the world, the violence of the *Enuma elish* is utterly rejected. We see an enlightened, indeed an inspired, people responding to superstition and ignorance regarding the nature of the world and humanity.

Now that we have this background, we can get a better understanding of the first creation account's true meaning. Scholars tell us that this meaning is communicated to us in two ways: both by certain important assertions, and in the way those assertions are made. We must look at both the message and the medium, both the statements in the story and the structure of the story, to catch its total meaning.

Let us give our attention first to the message itself. We can summarize it as follows: *The universe was created by a God who is one, who is all-powerful, who is perfectly intelligent, and who is perfectly good.*

The clearest element of the creation drama of Genesis 1 is that it has a single actor. In contrast to the *Enuma elish*, there is only *one God*. Everything else that exists has God as its source and designer. In the Babylonian religion, the sun, moon, and stars were all considered to be gods who had to be worshipped. In this story, they are lights which God turns on to illuminate the earth and to measure time for the sake of humanity. God has no rival in the universe or in any of its parts. Just as no stream can rival the spring from which it flows, so no creature can be compared with the Creator. Because the world and all that it contains have been created by God out of nothing, they cannot be divine themselves.

Perhaps the most interesting element of the account is the way creation comes about. It is not the accidental by-product of a divine brawl. It is, very clearly, a planned event—there is one God, and he makes all that exists according to his deliberate intention.⁸ The world exists because God willed it to be.

But God is not simply a feeling or a force in the story. His *astonishing power* is also revealed by the account, and it is infinitely greater than that of Marduk. God does not even have to exert himself in the making of the world in Genesis 1. He just speaks his word and the world springs into being, so that the universe can be defined simply as "the event of God's personal word."⁹ He burns no calories, nor flexes any

muscles, in the series of events, because calories and muscles are part of the creation, not of the Creator. Nothing disrupts his perfect tranquility, and a tranquil creation pours out of his own tranquility as he wills it to do so.

If there is anything active about God in the account, it is his mind. Just as the *Enuma elish* is saturated with violence, the Genesis account is saturated with intelligence, what many have called *divine rationality*. God is a profound architect, structuring and setting up a masterpiece of design:

There is no confusion; light is distinguishable from darkness, the land from the sea. Vegetation is abundant and guarantees a rich array of food for humanity. The categorization of animals, fish and birds reflects [an] appreciation for order.¹⁰

And the world God creates is good, a reflection of its *perfectly good Creator*. This goodness is both manifested in its order and explicitly declared by God. Seven times he sees and declares its goodness, a number which in the Bible signifies completion and perfection.

At one point, God's goodness and rationality reach a peak of intensity in his creative action—at the creation of his image, man and woman.

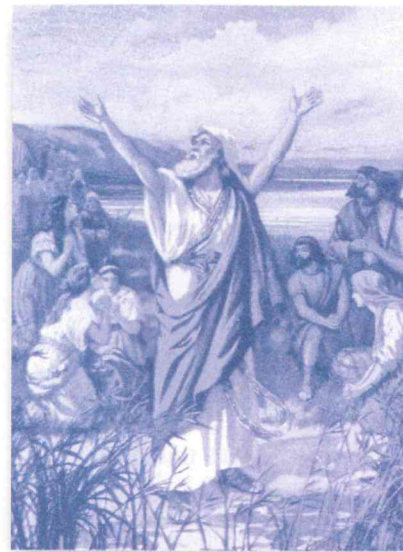
The author portrays God in deep reflection and planning only once—when he creates human beings. It is as if God is looking into a mirror as he speaks. Only human beings are called God's image and likeness. While God sees each part of his creation as good, only after man and woman are present in it does he call it “very good.” The message is clear—humans are not the spawn of Kingu's blood, but the reflection of God himself, “man and woman equally and in union with each other.”¹¹

God sees the goodness of all that he creates, but he speaks directly to his human creation, describing his will for them and the tasks they must fulfill. Only they are given the command to subdue the earth, and only they are given dominion over all the other creatures. In every way humans are to be part of the creation, but also a very unique part. *Humans are the summit of the perfection of God's creation.*

The Creator's oneness, power, rationality, and goodness are clear from the straightforward message of the account. Now we can look at the account's structure and see how it enriches the story and deepens its message.

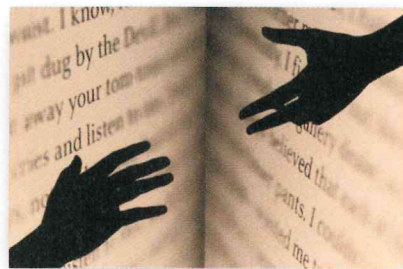
THE MEDIUM HAS A MESSAGE: READING THE SHAPE OF CREATION

Biblical scholars who have looked carefully at the creation account have some important details to add to our understanding of it that we might otherwise have overlooked. The rationality and goodness of the production of the world by God has a more fundamental layer



Ezra thanks God for his help

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NOTE THAT WHAT IS STRESSED IN THIS DEEPER ORDER IS NOT SO MUCH WHAT IS MADE FIRST, SECOND AND THIRD, BUT THAT EACH PART OF CREATION CORRESPONDS TO OTHER PARTS. THE WHOLE THING FITS, AND FITS TOGETHER PERFECTLY.

than just the events of the account. It also has a deeper order below its surface—*symmetry* (i.e., equality of measure) and proportion even characterize the way the story is told. The medium reinforces the written message and even carries its own message.

First, the six days of making (Gn 1: 1–31) actually interact with each other, making two columns of events. When the days are considered in two sets, Days 1–3 and Days 4–6, each day in the first column matches the corresponding day in the second column.

On Day 1, God makes light; on Day 4, he makes lights (sun, moon and stars). On Day 2, he makes sky and sea; on Day 5 he makes birds (sky creatures) and fish (sea creatures). On Day 3 he makes the dry land and vegetation (green plants and fruit trees); on Day 6 he makes the land creatures and humans who eat these plants and fruits.

Note that what is stressed in this deeper order is not so much what is made first, second and third, but that each part of creation corresponds to other parts. The whole thing fits, and fits together perfectly. Horizontally (that is, among its creatures), the world is symmetrically interdependent, just as it is vertically dependent on God.

Looking even more closely, we can detect *another* layer of meaning—the world God is creating is being set up precisely to support life. In the first three days things are made that are needed for the life created in the last three days. On Day 1 and Day 4 God makes light and the sources of light that benefit all living things. On Day 2 he makes sky and sea; on Day 5 the life forms that inhabit sky and sea. On Day 3 he makes land; on Day 6 the life forms that inhabit land. The fitting together of Days 1–3 with Days 4–6 reveals that the non-living world is made for the benefit of living creatures. As we shall see in Chapter Seven, this layer of meaning fits beautifully with what modern science has discovered, namely that the very structure of the universe in its fundamental laws seems specifically designed to bring about and support living things.

If the two sets of days run side-by-side perfectly like two columns, the seventh day is the arch that completes their unity: the *Sabbath*, God's day of rest (Gn 2: 1–4a). This particular aspect of the story offers a detail that science itself cannot teach or know about. It is that the world is ordered toward fulfillment, rest, and worship. God's rest is reflected in his later command to his people to keep the Sabbath (which will later become the “eighth day” of Christ's Resurrection) holy; that is, to order the Sabbath toward the One who gave rise to all things through intelligence and love.

The Sabbath, the majestic arch that binds all parts of the creation into one, is a clue for man as to what God's creation is all about. At least one thousand years after Genesis was written, St. Benedict of Nursia, the father of Western monastic life, captured this idea in his great Rule of Life, in which he says, “*Operi Dei nihil praeponitur*”—“Nothing



should be put before the service of God.”¹² And one thousand years after that, St. Ignatius of Loyola would write these words: “Human beings are created to praise, reverence and worship God, and by means of this to save their souls. The other things on the face of the earth are created for human beings to help them in pursuit of this goal for which they are created.” In other words, all the columns of creation point toward the arch, which is the possibility of finding fulfillment in God. As the Christian mystic Meister Eckhart once put it, “God enjoys himself, and wants us to join him.”

The medium is the message, or at least, it is a vital part of the message—God’s architectural masterpiece, the universe, is a unity, one which reflects God’s glory so that man can know God in it and serve him through it for the sake of man’s own happiness.

D. Obstacle or Origin? Genesis 1 and Modern Science

The picture of creation drawn by the author of Genesis 1 seems a perfect picture; in fact, it seems too perfect to some. As we noted above, many dismiss it as a religious daydream. Nice try, they say, but scientifically speaking, Genesis 1 is simply a primitive, unenlightened myth.

Yet we have already seen that the Genesis view of the world was a major part of the climate necessary for science to be born and to thrive. In rejecting it outright, scientific thinkers actually are sawing away at the very branch they are sitting on. The notion of an all-good, all-powerful, intelligent Creator implies that the universe he created has discoverable limits, order, and value. Without limits, order, and value, scientific investigators would have nothing to investigate.

So what are the difficulties raised by those who wish to dismiss the creation account? The devil is in the details. Here are a few problems that are often pointed out:

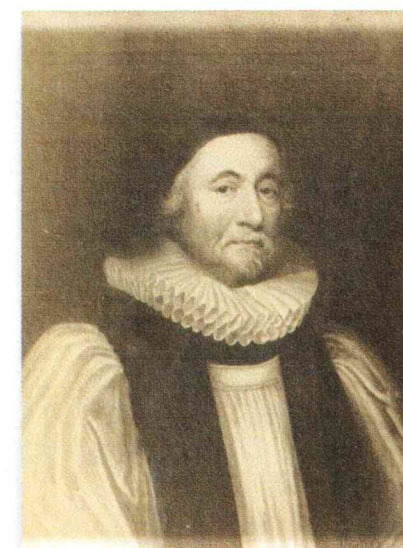
- 1) **The Superdome Sky**—Genesis 1:6 describes the sky as an upside-down bowl which has been submerged in water, having water on all sides and above it. But, of course, we now know that the sky is not shaped like a bowl.
- 2) **The Order of Production**—God makes plants before he makes the sun. The problem is obvious: how could they grow?
- 3) **The Duration of Creation**—Although the sun and moon are not created until the fourth day, it seems as if the whole production of the universe occurs in seven, twenty-four hour periods. Modern science, however, has shown the earth itself to be at least 4.5 billion years old and the universe to be 13.7 billion years old.

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**SOME BELIEVERS HAVE TRIED TO
CREATE A HARMONY BETWEEN
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CREATION ACCOUNT AND THE
COSMOGONY OFFERED BY
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THEOLOGICAL ERROR IS
CALLED CONCORDISM.**

Archbishop Ussher



The details of the account are clearly contradicted by modern science. How can the words that describe them be divinely inspired? There are two ways that believers have tried to answer this question. The first one is wrong—let us begin by dissecting it.

CONCORDISM: DRESSING UP THE DETAILS

In response to the growth of scientific knowledge of the details of the beginning of the universe and of the earth, some believers have tried to create a harmony between every detail of the Genesis 1 creation account and the *cosmogony* (i.e., the theory of the origin and evolution of the universe) offered by modern science. This is called *concordism*; and believers who have attempted to match up details in this way have fallen into two serious mistakes.

First, the concordists are trying to hit a moving target: science keeps changing. Later we will look at some important ways that it has changed in the last century. (See Parts II–III). As a result, concordists in the past succeeded by great ingenuity in matching the Bible to science, only to have that science later proven to be false. Here is the tragic irony: what was an attempt to strengthen faith in God actually resulted in jeopardizing that faith—the divine truth of the Bible was incorrectly tied to a discarded theory.¹³

A classic and somewhat ludicrous example occurred in the case of *Archbishop Ussher*, a seventeenth century Anglican thinker who attempted to reconcile the six-day creation account with the physics of Sir Isaac Newton. In his strained attempt at harmonization, he announced that the creation began in the year 4004 BC on Sunday, October 23, at 9:00 a.m.¹⁴

The second mistake involved in concordism is even more significant than the first. In artificially trying to tie the cosmogony of the Bible to a modern, scientific one, concordism actually misses the whole point of the account. To see this, we must look more closely at Genesis 1. Let us do so now with the help of a leading theologian of our day, Pope Benedict XVI.

DEALING WITH THE DAYS: WHAT GOD IS NOT TELLING US IN GENESIS 1

The beauty of the six-day account can be appreciated by anyone with a taste for ancient literature and poetic description. And its meaning can be discovered through its plain message and its structure, as we saw above. But to interpret what it means also requires discovering

what it does not mean. And this requires reading it in the context of the entirety of Sacred Scripture.

The Bible, the Christian Faith tells us, is a unity—it is one Book. As Pope Benedict XVI pointed out, “[The creation account in Genesis 1] is not, from its very beginning, something that is closed in on itself... Hence, the theme of creation is not set down once in only one place...”¹⁵ In fact, there are several other creation accounts in the Bible, including a much older one which immediately follows Genesis 1 (see Gn 2: 4b–25). By reading these other accounts alongside Genesis 1, we discover that certain details vary from one account to another (as the authors of the later accounts would obviously have realized), showing that, even to the authors themselves, such details were secondary to the heart of the message that God’s Word was conveying. These details simply serve as different ways of grasping hold of that deeper message.

For instance, whereas in Genesis 1 man is created last, in Genesis 2 God creates man before the other living things (Gn 2: 4b–7). If the details of the order of creation in Genesis 1 were part of Scripture’s divine message, it would make no sense for the second story to be included. Clearly, we are dealing with the literary dimension of the story when we deal with such poetic details as the dome sky, the exact sequence of events, and the duration of creation.

Here is another example. In Genesis 1, the message is proclaimed using the details of pagan mythology in order to correct them, to purify them of religious errors, and to orient them toward God. But Psalm 104, the great psalm of praise to the Creator, narrates God’s production of the world using different details. For instance, it speaks of the sun and moon only after the man and animals. Birds and fish are referred to separately from each other, while in Genesis 1 they are created together on Day 4. As Pope Benedict XVI points out,

Thus we can see how the Bible itself constantly readapts its images to a continually developing way of thinking, how it changes time and again... In the Bible, the images [e.g., the six days, the sky dome, etc.] are free and they correct themselves accordingly. In this way they show, by means of a gradual and interactive process, that they are only images, which reveal something deeper and greater.¹⁶

Is Pope Benedict XVI saying that the Bible is wrong? Obviously not. What he is saying is that Sacred Scripture has something to teach every age of history, regardless of the level of science any age may have reached. Its truth is “deeper and greater” than science, and it adopts the cosmogony of its age to express that truth. That is why, even in Scripture, the scientific details vary from creation account to creation account.



CLEARLY, WE ARE DEALING WITH THE LITERARY DIMENSION OF THE STORY WHEN WE DEAL WITH SUCH POETIC DETAILS AS THE DOME SKY, THE EXACT SEQUENCE OF EVENTS, AND THE DURATION OF CREATION.



IN SCRIPTURE, SOMETHING LIKE SCIENCE IS GOING ON. THERE IS A PROCESS BY WHICH THE PEOPLE OF ISRAEL (THE HUMAN ELEMENT) INTERACT WITH VARIOUS SOURCES OF INSIGHT AND WISDOM AND PRODUCE NEW WAYS OF EXPRESSING THAT “DEEPER AND GREATER” DIVINE TRUTH, WHICH DOES NOT CHANGE AND “WILL NOT PASS AWAY.”



THE DEEPER, GREATER TRUTH: SCIENCE AND SCRIPTURE

Now we can formulate the final response to the skeptic who would dismiss the Bible as anti-scientific. The images of the world and its creation given in Scripture are there to bear witness to “a deeper, greater” truth—that God creates the world in Reason and therefore establishes it as orderly, true, and good. The images are there to express this. Even in Scripture, something like science is going on. There is a process by which the people of Israel (the human element) interact with various sources of insight and wisdom and produce new ways of expressing that “deeper and greater” divine truth, which does not change and “will not pass away.”

Another example of the openness of Scripture to new ways of expressing revealed truth can be found in the Book of Wisdom. The author of that Book refers to his desire and prayer for the gift of wisdom. He then describes the wisdom he was given *in scientific terms*: “For he gave me sound knowledge of existing things, that I might know the organization of the universe and the force of the elements, the beginning and end and midpoint of times...” (Gn 7: 17–18a). Here, a biblical author, inspired by God and writing centuries after the Book of Genesis was written, goes on a quest for knowledge concerning the “beginning.” If the details of the Book of Genesis were to be taken as if they were scientific textbook facts, why would this inspired biblical author need knowledge of different details? As a Jew, he revered the Torah (including Genesis) as God’s Word. His desire for and openness to new insights leave no doubt that “sticking to the old images such as the seven days”¹⁷ is to miss the picture for the frame that holds it.

Of course, there is a major issue we have not yet touched upon: Has science overthrown the “deeper and greater” truth to which the human images in Scripture are pointing? Has God’s eternal Reason (which Scripture calls his Wisdom and his Word) been shown to be absent from creation—or magnificently pervasive throughout it? Is Divine Rationality really the final word on the world and the universe?

Most of this book will be spent answering this question. For now we can say this: the more deeply the sciences have penetrated the universe, the more its rich and wonderful rationality has been revealed. Albert Einstein, perhaps the greatest scientist of the twentieth century and even of human history, was himself taken aback by this fact. “In the laws of Nature,” he declared, “there is revealed such a superior Reason that everything significant which has arisen out of human thought and arrangement is, in comparison with it, the merest empty reflection.”¹⁸

Here the notion of the six days from Genesis 1 can be rediscovered as having an enduring significance even today in our scientific age. The process described there—the creation of light, of earth and sky, of celestial lights and living things—is the result of an intelligent



plan, not haphazard but ordered. Its deeper, greater truth is confirmed every time scientists uncover new and deeper levels of the order of nature—from the vastness uncovered by astronomy all the way down to the minute order found in subatomic particles.

THE FINAL WORD ON CREATION: THE WORD WAS GOD

The last creation account given in Sacred Scripture was written by a Jew who was also a Christian; it is found in the New Testament in Chapter One of St. John's Gospel. In it and through it we reach down so deeply into the truth of the world that we are allowed to reach right into the identity of the Creator:

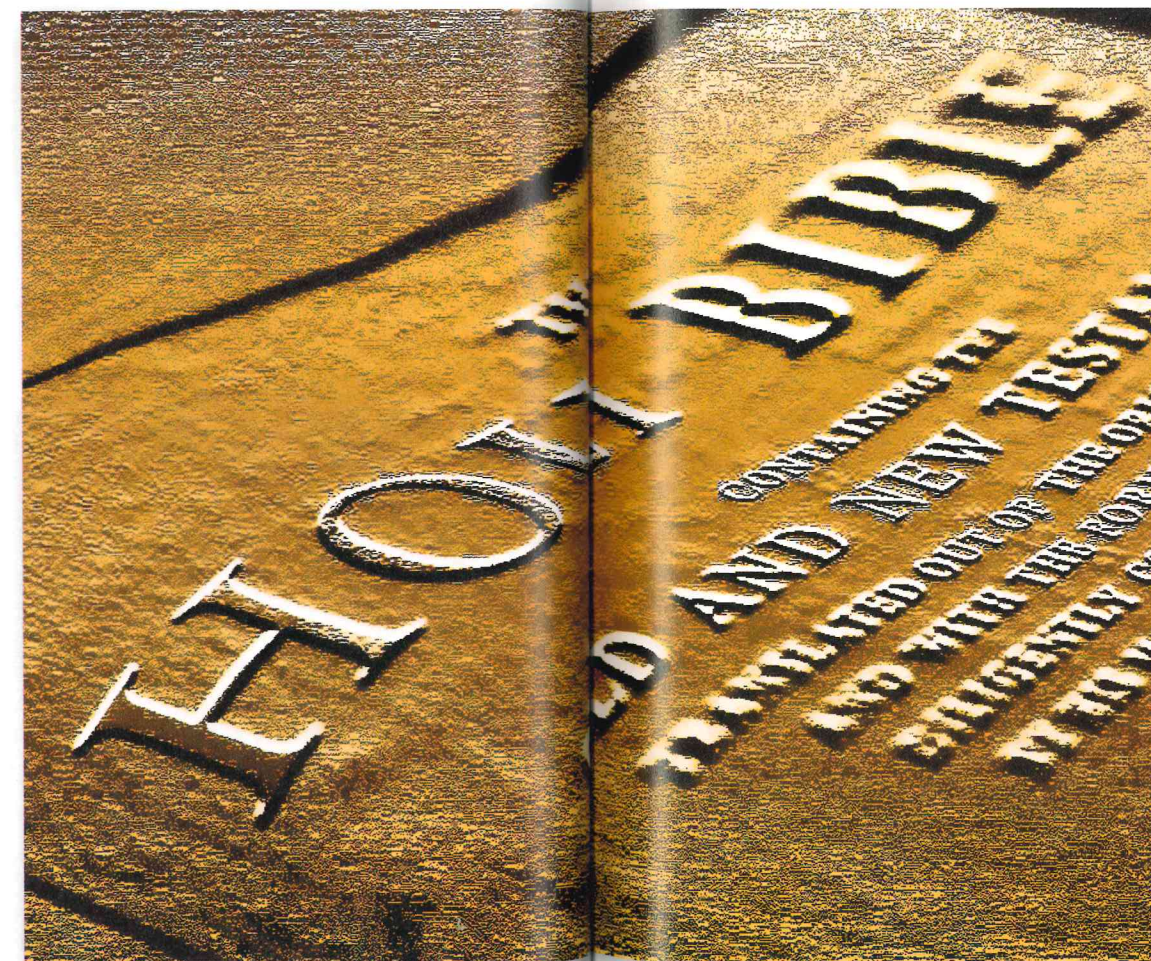
- 1 *In the beginning was the Word [Logos], and the Word was with God, and the Word was God.*
- 2 *He was in the beginning with God;*
- 3 *all things were made through him, and without him was not anything made that was made.*
- 4 *In him was life, and the life was the light of men.*
- 5 *The light shines in the darkness, and the darkness has not overcome it.*
- 10 *He was in the world, and the world was made through him, yet the world knew him not.*
- 14 *And the Word became flesh and dwelt among us, full of grace and truth; we have beheld his glory, glory as of the only Son from the Father.*
- 16 *And from his fulness have we all received, grace upon grace.*
- 17 *For the law was given through Moses; grace and truth came through Jesus Christ.*
- 18 *No one has ever seen God; the only Son, who is in the bosom of the Father, he has made him known.*

The Greek word "Logos," which is usually translated "Word," also means "Reason." So this famous passage also bears this meaning: "In the beginning was Reason, and Reason was with God, and Reason was God. He was in the beginning with God. All things came to be through him..." Thus, Divine Reason, the blueprint of the universe, becomes flesh in Jesus Christ. All things flow, not from a divine What, but a divine Who—the Son, the Image of the Father who is one with and equal to the Father, brings the universe about as an expression of God's goodness.

"IN THE BEGINNING WAS REASON, AND REASON WAS WITH GOD, AND REASON WAS GOD. HE WAS IN THE BEGINNING WITH GOD. ALL THINGS CAME TO BE THROUGH HIM..."
THUS, DIVINE REASON, THE BLUEPRINT OF THE UNIVERSE, BECOMES FLESH IN JESUS CHRIST.



Clio



The Father loves the Son from all eternity, and the universe is a free overflow of that love. It is created by the Father, the power behind its existence, for and through the Son, the source of its rationality and order, in the Divine Love they share—the Holy Spirit, who is the source of its goodness. How far we have come from the *Enuma elish*, with its foreboding, terror-filled chaos of murderous deities and demons, can be seen in the words of the Christian mystic Meister Eckhart, who once declared that "the world is created out of the laughter of the Trinity."

E. The Whole Picture

For the sake of summarizing, let us go back to the three points with which we began our explanation and interpretation of Genesis. Noting that Scripture was both human and divine, we developed a *holistic* (a complete, "both/and") approach to Scripture which respects both:

~1~

The Bible tells us, without error, all we need to know for the sake of our salvation about the world God created. And in the specific case of the creation account in Genesis, we see that the story does exactly that: it reveals that the world has an all-powerful, all-good, perfectly intelligent God as its source (reflected in the logically ordered and perfectly symmetrical "six days") and its unifying summit (the "seventh day"). Its plain message and its structure both point confidently to a creation that flows from eternal Reason and reflects it. The words of St. Thomas Aquinas make this point, and then lead us to our second principle:

With respect to the origin of the world, there is one point that is a matter of faith, that is, to know that it began by creation... *But the manner and order according to which creation took place concerns the faith only incidentally*, in so far as it has been recorded in Scripture, and of these things [the fathers of the Church and Christian theologians], safeguarding the truth by their various interpretations, *have reported different things.*¹⁹

~2~

The Bible tells us this truth using language and images about the physical world that are not scientific. In regard to this aspect of Genesis 1, we see that, when we read it in the light of the rest of Sacred Scripture, we do not need to strain the details to fit modern scientific discoveries. These details are not there to give us an exact, scientific cosmogony; they are images that are open and freely

adaptable to new contexts, especially to the context of new knowledge. Here we should remember that this principle is an ancient one; we can see it in Scripture itself in the Book of Wisdom.

To those believers who would demand some kind of concordism, or even worse, a strict literal interpretation that rejects modern science, we can offer the response of St. Augustine:

[It] is a disgraceful and dangerous thing for unbelievers to hear a Christian, presumably giving the meaning of Holy Scripture, talking nonsense on [scientific subjects]... If they find a Christian mistaken in a field which they themselves know well and hear him maintaining his foolish opinions about our books, how are they going to believe those books in matters concerning the resurrection of the dead, the hope of eternal life, and the kingdom of heaven...?

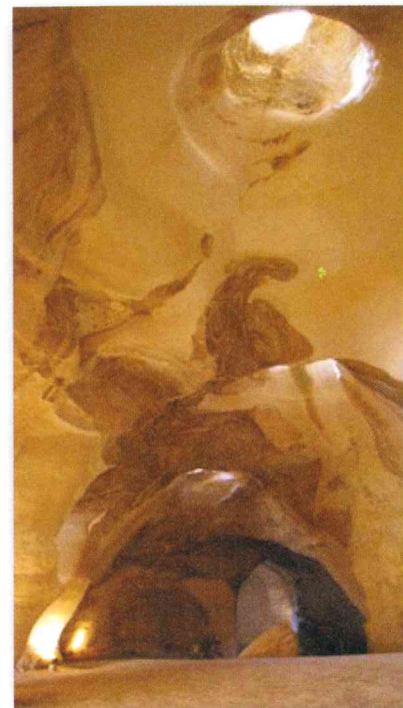
For then, to defend their utterly foolish and obviously untrue statements, [some believers] will try to call upon Holy Scripture for proof and even recite from memory many passages which they think support their position, *although they understand neither what they say nor the things about which they make assertion.*²⁰

~3~

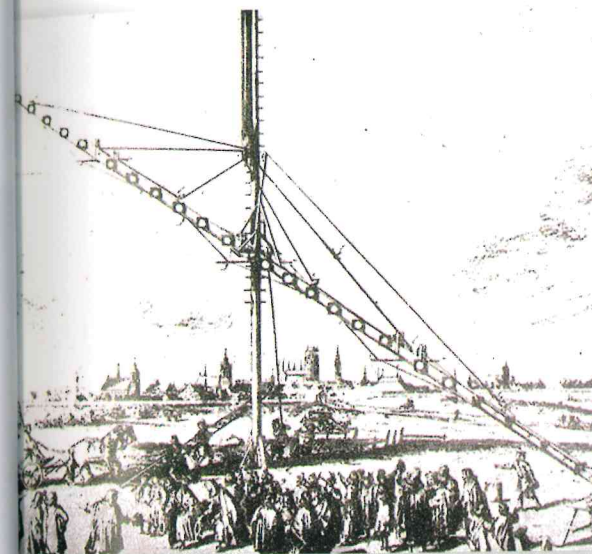
The literary way in which this truth is transmitted in the Bible has something to teach us. In regard to the creation account in Genesis 1, we saw that the total story, even in its pre-scientific details, gives a wonderful way of approaching the vastness of the universe “in a nutshell”—all of its beauty, its vastness, its incredible detail, all boils down to the glory of its Creator offered freely to humanity, finding its summit in the fulfillment which God offers it in a Sabbath rest and worship that ultimately leads to union with himself. The gift is great, but the Giver is even greater.

If the purpose of the creation accounts in the Book of Genesis had been to give us scientific knowledge about how the universe began, how stars and planets formed, and how life started on earth, we would have to judge them miserable failures. But that was obviously not their purpose. The priests of the Jewish people had other things on their minds during their woeful exile in Babylon besides physics, chemistry, astronomy, geology, and biology. Their concerns were entirely religious. And so if we think of the details of Genesis 1 as scientific details, we will be reading into them a kind of meaning of which the authors never dreamed.

The details do indeed have meaning. They were painstakingly chosen and arranged, but to teach religious truths, not scientific ones. What mattered to the authors was not whether the moon was made by the condensation of a dust cloud as once was thought, or by the impact of a large object striking the earth as is now thought, or by some other



THE AUTHORS OF GENESIS HAD SOMETHING TO TELL US ABOUT THAT PURPOSE. THE UNIVERSE DOES NOT ONLY EXIST FOR ITS OWN SAKE, BUT SO THAT THERE COULD BE LIFE. AND LIFE DOES NOT EXIST ONLY SO THAT THERE COULD BE PLANTS AND ANIMALS, BUT SO THAT THERE COULD BE RATIONAL BEINGS MADE IN THE IMAGE OF GOD.



WE MUST LOOK INTO THE DISTANT PAST AND FIRST EXPLORE THE MARVELOUS HISTORY OF THE CHURCH'S SUPPORT OF THE SCIENCES. THEN WE MUST LOOK DIRECTLY AT THAT BLEMISH AND INTO THE LIFE OF A SCIENTIST WHOSE NAME IS ALMOST A SYNONYM FOR SCIENTIFIC DISCOVERY—GALILEO GALILEI.

mechanism; what mattered to them was just that it *was* made, that it is a part of God's creation and not itself a god. They were not proposing a theory about how the universe is ordered, but calling attention to the gigantic fact that it is ordered and that its orderliness points to a divine plan. The pattern of the Six Days is not the kind of pattern that the modern physicist would capture with an equation or a graph, but the kind of pattern that reveals a purpose. And the authors of Genesis had something to tell us about that purpose. The universe does not only exist for its own sake, but so that there could be life. And life does not exist only so that there could be plants and animals, but so that there could be rational beings made in the image of God. And these beings have not been made only for themselves, but so that they could have a relationship with God, a relationship expressed in the notion of a Sabbath and in the notion of a “rest” that stands for completion and fulfillment: the eternal rest we shall have with God, the rest of which St. Augustine spoke when he said, “Our hearts are restless until they rest in Thee.”

F. Looking Ahead

Sacred Scripture is not only compatible with science, but it fosters it and offers it a transcendent goal. What is true of biblical cosmogony is also true of other pre-scientific details. Throughout this text, we will return to Sacred Scripture: miracles, the second creation account in Genesis, and many other biblical topics will emerge as we continue our quest to rediscover faith on the frontiers of science.

The Bible is not simply a divinely inspired Book; as we saw at the beginning of this chapter, it is also the Book of the Church. God's Book is certainly compatible with science, but what about his Church and her teachings? For some people, the fact that the Catholic Church is pro-science is almost as surprising as the fact that Scripture is pro-science. There is a reason for this; while she has defended and promoted science for centuries, the Catholic Church also has a serious blemish on her history, one that explains why many in modern society consider her to be a harsh persecutor of scientific pioneers. To understand this, we must look into the distant past and first explore the marvelous history of the Church's support of the sciences. Then we must look directly at that blemish and into the life of a scientist whose name is almost a synonym for scientific discovery—Galileo Galilei.

Supplementary Reading

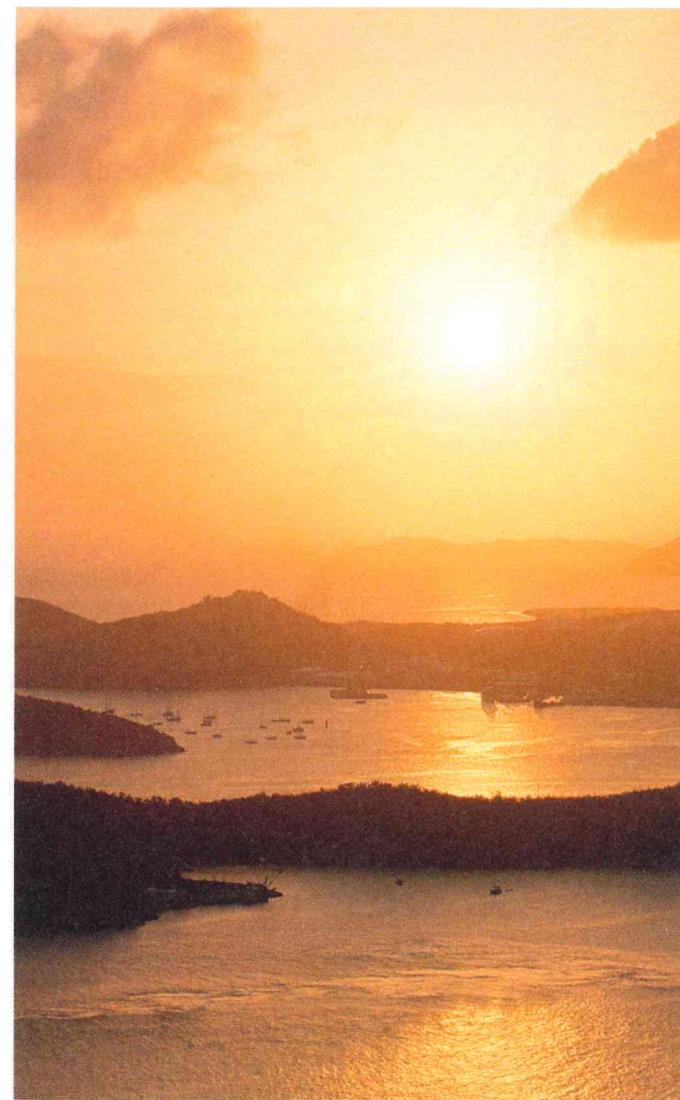
“The Voice of Vatican II: The Human and Divine Elements of Sacred Scripture”

(Vatican II, *The Dogmatic Constitution on Divine Revelation*, Chapter III,
“Sacred Scripture, Its Inspiration and Divine Interpretation”)

11. Those divinely revealed realities which are contained and presented in Sacred Scripture have been committed to writing under the inspiration of the Holy Spirit. For holy mother Church, relying on the belief of the Apostles (see Jn 20: 31; 2 Tm 3: 16; 2 Pt 1: 19–20; 2 Pt 3: 15–16), holds that the books of both the Old and New Testaments in their entirety, with all their parts, are sacred and canonical because written under the inspiration of the Holy Spirit, they have God as their author and have been handed on as such to the Church herself. In composing the sacred books, God chose men and while employed by him they made use of their powers and abilities, so that with him acting in them and through them, they, as true authors, consigned to writing everything and only those things which he wanted.

Therefore, since everything asserted by the inspired authors or sacred writers must be held to be asserted by the Holy Spirit, it follows that the books of Scripture must be acknowledged as teaching solidly, faithfully, and without error that truth which God wanted put into sacred writings for the sake of salvation. Therefore “all Scripture is divinely inspired and has its use for teaching the truth and refuting error, for reformation of manners and discipline in right living, so that the man who belongs to God may be efficient and equipped for good work of every kind” (2 Tm 3: 16–17, Greek text).

12. However, since God speaks in Sacred Scripture through men in human fashion, the interpreter of



Supplementary Reading

Sacred Scripture, in order to see clearly what God wanted to communicate to us, should carefully investigate what meaning the sacred writers really intended, and what God wanted to manifest by means of their words.

To search out the intention of the sacred writers, attention should be given, among other things, to “literary forms.” For truth is set forth and expressed differently in texts which are variously historical, prophetic, poetic, or of other forms of discourse. The interpreter must investigate what meaning the sacred writer intended to express and actually expressed in particular circumstances by using contemporary literary forms in accordance with the situation of his own time and culture. For the correct understanding of what the sacred author wanted to assert, due attention must be paid to the customary and characteristic styles of feeling, speaking and narrating which

prevailed at the time of the sacred writer, and to the patterns men normally employed at that period in their everyday dealings with one another.

But, since Holy Scripture must be read and interpreted in the sacred spirit in which it was written, no less serious attention must be given to the content and unity of the whole of Scripture if the meaning of the sacred texts is to be correctly worked out. The living tradition of the whole Church must be taken into account along with the harmony which exists between elements of the faith. It is the task of exegetes to work according to these rules toward a better understanding and explanation of the meaning of Sacred Scripture, so that through preparatory study the judgment of the Church may mature. For all of what has been said about the way of interpreting Scripture is subject finally to the judgment of the Church, which carries out the divine commission and ministry of guarding and interpreting the word of God.

13. In Sacred Scripture, therefore, while the truth and holiness of God always remains intact, the marvelous “condescension” of eternal wisdom is clearly shown, “that we may learn the gentle kindness of God, which words cannot express, and how far he has gone in adapting his language with thoughtful concern for our weak human nature.” For the words of God, expressed in human language, have been made like human discourse, just as the word of the eternal Father, when he took to himself the flesh of human weakness, was in every way made like men.



Supplementary Reading

“The Bible and Modern Science”

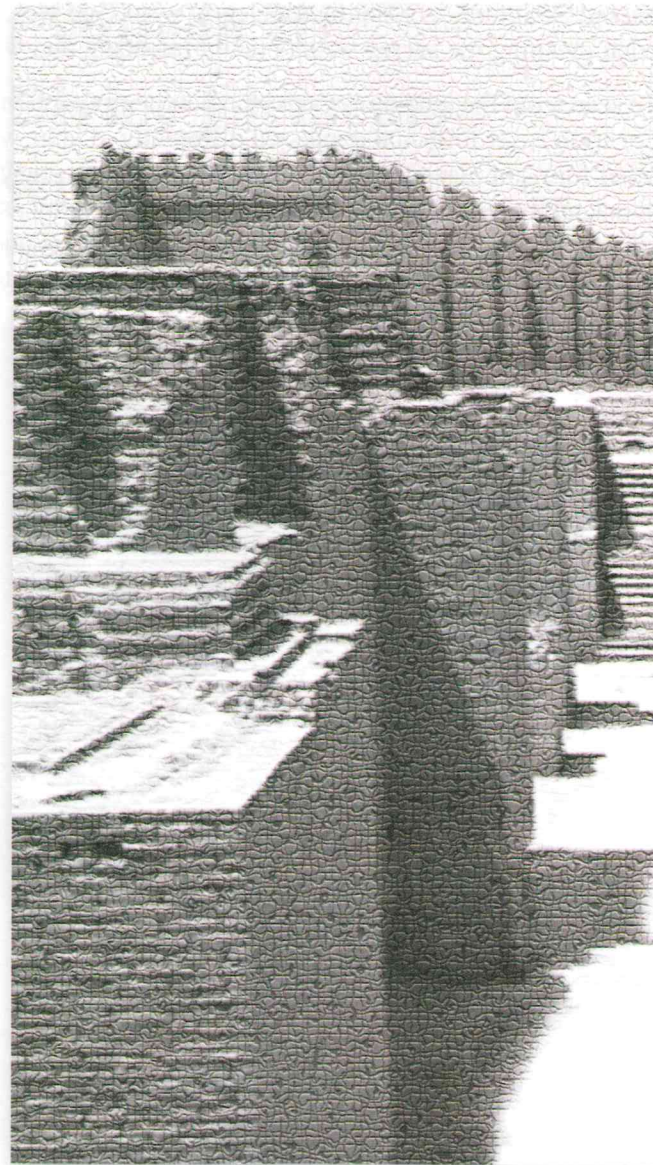
(excerpted from Peter E. Hodgson,
Theology and Modern Physics
 [Ashgate Publishing, 2006], pp.21–24)

A new beginning, a fresh style of scientific thinking, was made possible by the Judeo-Christian vision of the world. The God of the Hebrews is very different from the God of Plato or the Prime Mover of Aristotle. In sharp contrast, the God of the Hebrews freely created a world completely distinct from himself, and his actions are inscrutable to men unless he freely chooses to reveal his plans.

The book of Genesis bears witness to the Hebrew belief in a transcendent creator from its opening phrases: “In the beginning God created the heavens and the earth . . . And God saw all that he had made, and indeed it was very good” (Gn 1:31). The Hebrew word translated as “good” also means “beautiful”, and beauty is one of the most important characteristics of a scientific theory. In contrast to the confused creation myths of the surrounding nations, the creation story in Genesis has a clear logical structure, expressed in poetic form. It clearly expresses the belief in the absolute sovereignty, rationality and benevolence of God, who brings everything into being by his command and communicates his own goodness to them. Although not expressed in modern language, it contains the essential beliefs about the world that must be held if science is to flourish.

The earliest psalms tell us how God made the world and prepared it for man: He sets the heavens, the moon and the stars in their places, obeying a law that is fixed forever (Ps 148). He makes man the ruler over his works, ordering everything “in measure, number and weight” (Wis 11:20). In his reply to Job, Yahweh asks:

*Where were you when I laid the foundation of the earth?
 Tell me, if you have understanding.
 Who determined its measurements—surely you know!
 Or who stretched the line upon it?*



Supplementary Reading



*On what were its bases sunk,
 or who laid its cornerstone,
 when the morning stars sang together;
 and all the sons of God shouted for joy? (Job 38: 4–7)*

[In the Bible, n]othing comes into being, nothing remains in being, without being loved and willed by God:

*For thou lovest all things that exist,
 and hast loathing for none of the things
 which thou hast made,
 for thou wouldst not have made anything
 if thou hadst hated it.
 How would anything have endured
 if thou hadst not willed it?
 Or how would anything not called forth by thee
 have been preserved?
 Thou sparest all things, for they are thine,
 O Lord who lovest the living. (Wis 11: 24–26)*

The heroic mother of the seven martyred brothers in Maccabees (2 Mc 7:22–23) likewise expressed her belief in creation when she exhorted her sons to stand firm, saying to them:

I do not know how you came into being in my womb. It was not I who gave you life and breath, nor I who set in order the elements within each of you. Therefore the Creator of the world, who shaped the beginning of man and devised the origin of all things, will in his mercy give life and breath back to you again, since you now forget yourselves for the sake of his laws.

When it came to the last son, Antiochus tried to persuade him to abandon the traditions of his ancestors, and appealed to his mother to advise the young man to save his life. She finally agreed to persuade her son, but she fooled the cruel tyrant with the words:

I beseech you, my child, to look at the heaven and the earth and see everything that is in them, and recognize that God did not make them out of things that existed. Thus also mankind comes into being. Do not fear this butcher, but prove worthy of your brothers. Accept death, so that in God's mercy I may get you back again with your brothers. (2 Mc 7: 28–29)

Supplementary Reading

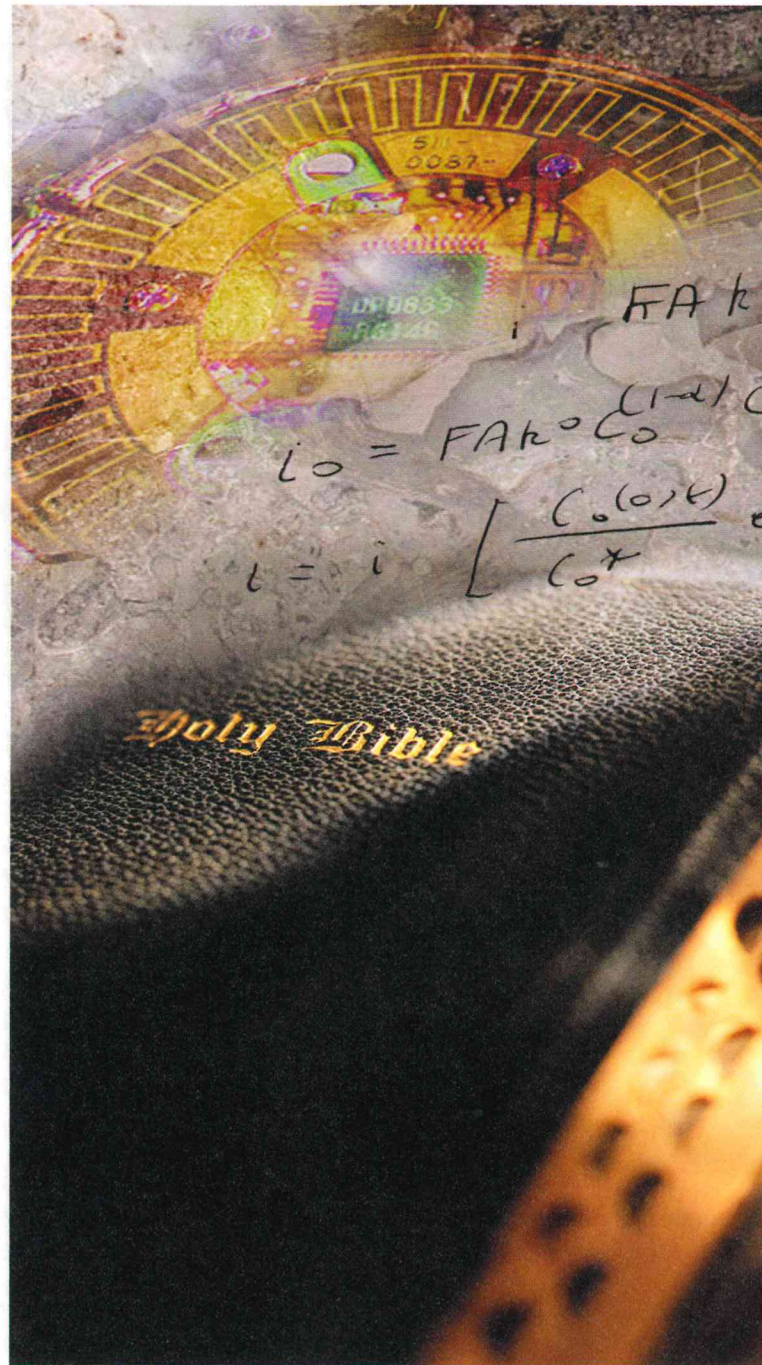
[In the Book of Jeremiah,] the faithfulness of God to Israel is compared with the reliability of natural phenomena (Jer 31:35). [Ps 119 does the same:]

*For ever, O LORD, thy word
is firmly fixed in the heavens.
Thy faithfulness endures
to all generations;
thou hast established the earth,
and it stands fast. (Ps 119: 89–90)*

The order and stability of natural phenomena are taken for granted with the same quiet certainty as shown by the mother of the seven brothers:

*The works of the Lord have existed
from the beginning by his creation,
and when he made them,
he determined their divisions.
He arranged his works
in an eternal order,
and their dominion for all generations;
they neither hunger nor grow weary,
and they do not cease from their
labors. (Sir 16: 26–27)*

Matter is entirely passive and it consequently endures, obedient to God's will. It is a perfect model for us. Thus according to Judeo-Christian beliefs, the world is the free creation of God from nothing. The structure of the world cannot therefore be deduced from first principles; we have to look at it, to make observations and experiments to find out how God made it.



Supplementary Reading

The Catechism of the Catholic Church on the Sabbath

345 The sabbath—the end of the work of the six days. The sacred text says that “on the seventh day God finished his work which he had done,” that the “heavens and the earth were finished,” and that God “rested” on this day and sanctified and blessed it.²¹ These inspired words are rich in profitable instruction:

346 In creation God laid a foundation and established laws that remain firm, on which the believer can rely with confidence, for they are the sign and pledge of the unshakeable faithfulness of God's covenant.²² For his part man must remain faithful to this foundation, and respect the laws which the Creator has written into it.

347 Creation was fashioned with a view to the sabbath and therefore for the worship and adoration of God. Worship is inscribed in the order of creation.²³ As the rule of St. Benedict says, nothing should take precedence over “the work of God,” that is, solemn worship.²⁴ This indicates the right order of human concerns.

348 The sabbath is at the heart of Israel's law. To keep the commandments is to correspond to the wisdom and the will of God as expressed in his work of creation.

349 The eighth day. But for us a new day has dawned: the day of Christ's Resurrection. The seventh day completes the first creation. The eighth day begins the new creation. Thus, the work of creation culminates in the greater work of redemption. The first creation finds its meaning and its summit in the new creation in Christ, the splendor of which surpasses that of the first creation.²⁵

