

CHAPTER ONE

COSMOLOGY



My hand laid the foundation of the earth,
and my right hand spread out the heavens;
when I call to them,
they stand forth together.

* ISAIAH 48:13

How important it is—that we learn the Sacred Story of our Evolutionary Universe, just as we have learned our cultural/religious stories. Each day we will begin to do what humans do best: Be amazed! Be filled with reverence! Contemplate! Be entranced by the wonder of the Universe.

* MARY SOUTHARD, CSJ


Knowing who you are is impossible without knowing where you are.

* PAUL SHEPHERD

From the dawn of consciousness human beings have asked significant questions: “Who are we?” “Where do we come from?” “Where are we going?” Early on, humankind experienced not only a fascination with the celestial bodies that fill the sky by day and by night, but they have known a sense of connection to them as well. Somehow the questions and the stars seem linked, as evident in many of the creation stories that seek to express the origin and meaning of the universe and our place in it.

Every culture in history has told stories in response to the questions that arise out of human awareness and experience of the world. Cosmology is the story that flows out of the study of the origin and development of the universe, including who we are and what we are about. While cosmology includes science, it goes beyond science and the empirical method to explore our experience of purpose and meaning. While cosmology addresses ultimate concerns through story telling by pointing to the Ground of Being, it is not identical with theology, which normally begins with religious experience and engages in a disciplined exploration of human encounter with the divine. Cosmology “is the story of the birth, development, and destiny of the universe, told with the aim of assisting humans in their task of identifying their roles within the great drama.”¹

Stories have power. Because they include metaphor and symbol, the narratives we tell speak to the depth dimension of our lives, shaping our psyches and forming our moral and ethical fiber. Sacred stories—also called myths—express the wisdom of their particular cultures and continue to reveal to listeners some of the profundity of the original experience they describe. Jesus grasped this truth, using parables to teach his followers. Whether invited to consider the response of a father awaiting the return of a lost son or the fate of seed scattered on both good soil and hard stone, those who heard Jesus’ stories




were drawn in. As they listened, previously unheard truths began to emerge and the paradigm in which they had been entrenched was exposed as deficient. Those who glimpsed the emergent truths were challenged to live out of a fresh structure of reality that broadened their notions about who they were in the world and how they were to live in it.

Besides challenging his listeners to consider who they were, Jesus urged them to consider who God was. Every story Jesus told revealed something of the Holy, the reality he called “Father,” the image that itself is a metaphor for what theologian Karl Rahner called “incomprehensible Holy Mystery”—an ultimate reality far beyond any box we try to put “God” in. Jesus’ storytelling—his ability to draw folks into another picture of the real—opened up to his disciples and to us the possibility of the reign of God, a way of living that flows out of a vision characterized by compassion and love, a way of living in the here and now, a way of living that is rich, full, and radically amazing.

Since the seventeenth century, when religion and science went their separate ways, we have assumed that the truths and stories of one are incompatible with the truths and stories of the other. The result has been a kind of schizophrenic existence in which we compartmentalize our experience and hope that there will be no clashes that break our carefully constructed categories or expose our illusions. The scripture scholar Anthony Padovano has said that it is not healthy to live and work in one world and believe and pray in another. And yet we do just that. We live and work in a world in which science speaks one version of the truth while we believe and pray in a world in which religion speaks another. And often the two do not seem to relate at all.

If we live and work in a world in which belief and prayer make no sense, if our belief and prayer do not resonate with what we know to be true “out there” in the “real” world, we have nothing to support and nurture us. If we believe and pray in a way that has no contact or



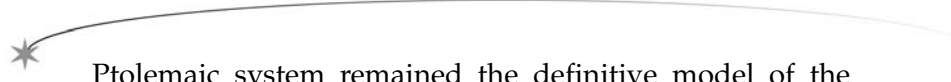
connection with the world in which we live and work, our lives can feel meaningless and without purpose. To live and work in one world and believe and pray in another makes our lives seem fragmented and disconnected, even alienated from what is truly lifegiving. I believe the new cosmology can help reconcile the rift between science and religion, enabling us to live more holistically, without the tension and conflict that tear unnecessarily at our lives.

The Old Cosmology

Before looking at the new cosmology in the next chapter, it is helpful to look at its underpinnings. What we know today has been the result of centuries of questioning and searching for answers, an evolution that has proceeded step by step, with each new answer giving rise to the next new question. Here is a brief overview of the foundations upon which the new cosmology rests.

The primary authority on the cosmos in the classical Greek era was Aristotle² (384–322 B.C.E.). Because his method was based on actual observation and rational thought, Aristotle is often considered to be the first scientist.³ In his cosmology, Heaven and Earth were completely separate realms. The heavenly realm embodied the perfect, while the earthly realm embodied the imperfect. In other words, the heavenly and earthly were considered to be two distinctly different kinds of realities. Like the other ancients, Aristotle believed that the Earth was the center of the cosmos, with all the celestial bodies orbiting around her. The Earth was not in motion, but remained fixed and at rest. In this cosmology the orbital paths of the Sun, moon, planets, and stars formed perfect concentric circles around Earth.

Eventually, as techniques became more sophisticated, observers determined that the motion of planets in the sky did not conform to predictions of the circular model. Ptolemy of Alexandria (127–151 C.E.), another Greek astronomer, developed a system of circles within circles that more accurately described the motion of planets. This

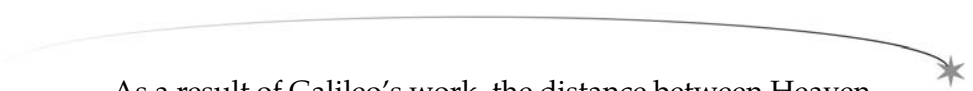


Ptolemaic system remained the definitive model of the cosmos for fifteen hundred years.

The first major figure to emerge in the Middle Ages was the Polish astronomer Nicholas Copernicus (1473–1543). Just before his death Copernicus published *De revolutionibus orbium coelestium* (*On the Revolution of the Celestial Spheres*) in which he proposed that Earth rotates on its own axis once each day and revolves around the Sun once each year. Copernicus upset two prevailing views: that Earth was fixed in place and that she was the center of the cosmos. Copernicus still believed that the distant stars were a fixed band of celestial bodies that formed a belt around our solar system.

Although *De revolutionibus* was dedicated to Pope Paul III, it was placed on the Index of Forbidden Books in 1616 and not removed until 1835. Why were the astronomer's ideas so dangerously heretical? Copernicus' revelation was not merely a fascinating astronomical discovery. It changed the way human beings viewed themselves. Our Christian creation stories had been interpreted in a way that placed human beings at the center of the universe, appointed by the divine to have dominion over the created world. What a shock it was to discover that we are not the axis of the universe after all!

It took until the early seventeenth century for Copernicus' claims to be substantiated. In 1609 the Italian scientist Galileo Galilei (1564–1642) fashioned an astronomical telescope and turned it toward the night skies. What he discovered was four moons orbiting Jupiter in the same way that Copernicus had said the Earth revolves around the Sun. Besides confirming Copernicus' theory, Galileo also observed that the planet Venus has phases just like our moon and that the Sun has spots or blemishes on her surface. Through Galileo's observations the notion that the heavenly realm and the earthly realm were two distinctly different kinds of reality began to crumble. The Sun was no longer perfect, and perfect circles no longer accurately described the cosmological system.

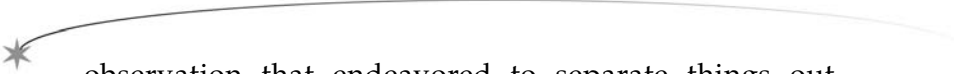


As a result of Galileo's work, the distance between Heaven and Earth began to shrink, a development that would have a profound impact on how human beings viewed themselves in relation to the cosmos. By the end of the seventeenth century human beings could no longer regard themselves as the center of the universe, and the heavenly and earthly realms were not so distinctly different after all.

A final discovery made by Galileo was a stepping stone for Isaac Newton. Galileo theorized that the natural state of matter is to move and keep moving rather than remain motionless or fixed. Neither, he proposed, does matter move randomly, but in a straight line at a constant speed. This theory would be crucial to Newton's formulation of the laws of physics.

By coincidence Isaac Newton was born in 1642, the same year Galileo died. It was Newton (1642–1727), an English scientist and mathematician, who discovered the laws of motion and universal gravitation and brought science into the modern era. In 1687 he published *Philosophiæ naturalis principia mathematica* (*Mathematical Principles of Natural Philosophy*) or simply the *Principia*, considered by many to be the greatest scientific book ever written. If there were any vestiges of the belief in a perfect Heaven distinct and completely “other than” Earth, they were to crumble under the weight of Newton's discoveries, which revealed that the motion of Earth and all the other celestial bodies operate out of the same laws. The moon and the apple rumored to have fallen on Newton's head are both governed by a force called gravity.

The age ushered in by Newton was one of great scientific discovery and technological advancement. The instruments used for exploration on both the macro and micro levels became ever more sophisticated. The microscope led to the discovery of the atom—which means “indivisible”—leading scientists to believe they had detected the most fundamental building block of the universe. The scientific method that took hold and was used to explore the world during this period involved



observation that endeavored to separate things out, reducing them to their smallest basic components, then testing hypotheses through experimentation. Scientific exploration was based on the belief that the universe on both the macro and micro levels consists of discrete units of matter that can easily be disconnected one from another without consequence.

Newtonian physics held that the scientific method allowed scientists to make observations with total objectivity. Scientists thought it was possible to separate the observer from the observed, being completely detached without influencing the observation. The result was that the cosmos was viewed as a machine consisting of perceptible, determined, predictable pieces of matter. This included nature, which became fair game for exploitation in the name of progress, a movement that has had detrimental consequences in our time.

With Newton's discoveries it is possible to see just how deeply the scientific view of reality penetrates our psyches. Just as Newton asserted that the physical arena was governed by certain immutable laws, so Sigmund Freud asserted that the psychological realm is governed by immutable laws. Using the theory of atoms as distinct, bounded units of matter, the philosopher John Locke proposed that the individual, not community, is primary. Because rational thought and the "objective" scientific method were considered to be the only valid way to view the world, intuition, emotional and artistic expression, and experience of the Holy were devalued as inauthentic and useless, or even harmful.

As these ideas began to penetrate and take hold of our psyches, especially in the Western world, human beings began to change the beliefs that had been a guide in earlier times. As the belief that life is composed of separate units of matter seeped in, individualism replaced the primacy of community. With experience of the divine viewed as suspect, the myths and rituals that spoke to the depth dimension of our lives were assigned at best a peripheral