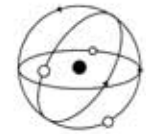
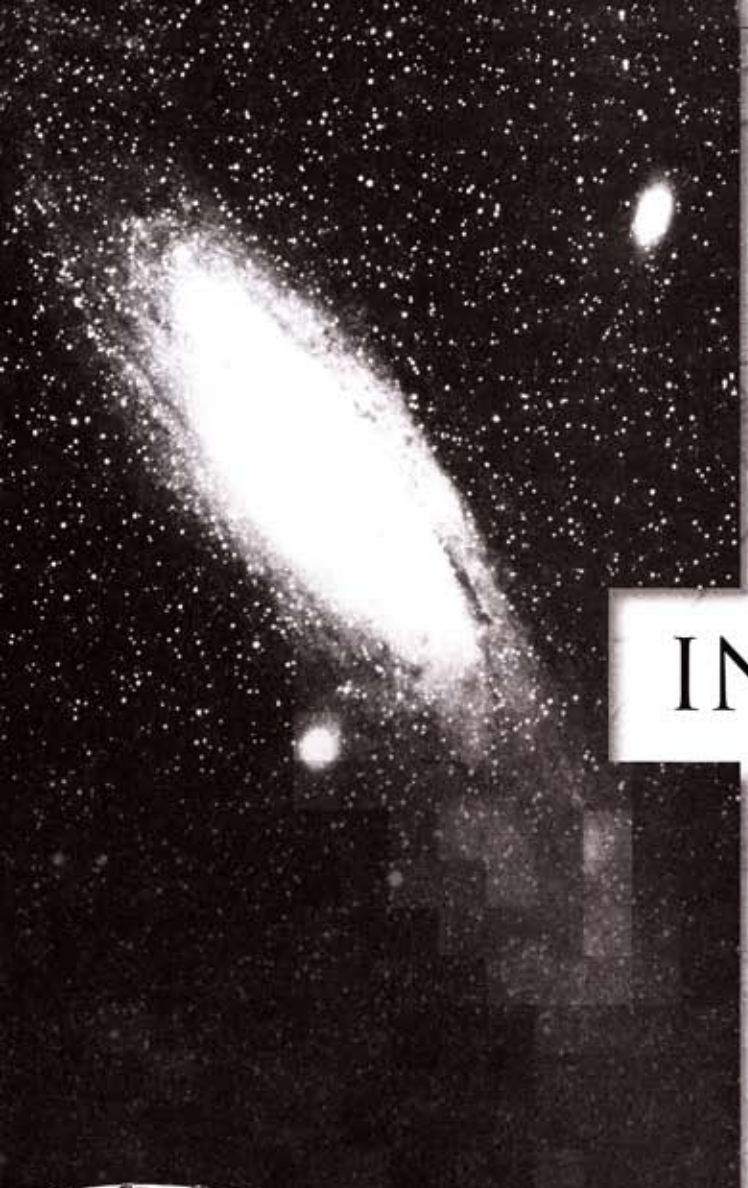
Table of Contents

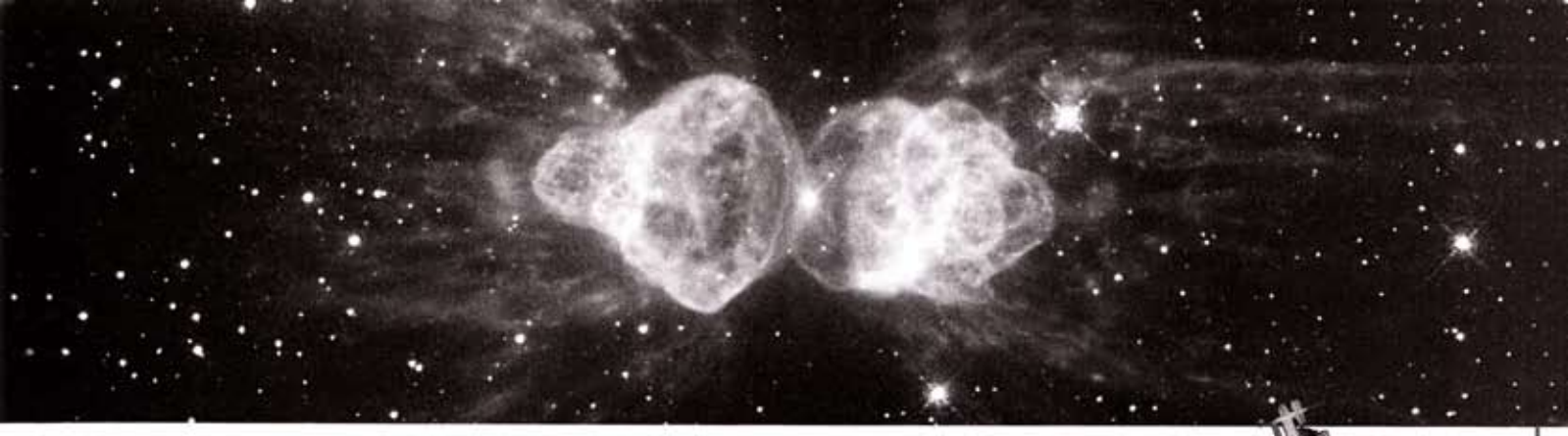




INTRODUCTION

The first few chapters of the Bible describe what I, the author, believe to be the origin and early history of mankind, the earth, and the universe. Even a cursory reading of the Book of Genesis by anyone reasonably scientifically literate ought to result in awareness that the biblical and scientific stories of creation are markedly different. Not wanting to live in a fragmented world of the Bible on Sunday and science the rest of the week, most Christians develop some reconciliation of the two. Either this process results in a world view, or it is based upon an often tacit world view. For instance, one will usually attempt to reconcile the Bible to science or science to the Bible. It is important to understand what one believes in Genesis, because certain rules of biblical interpretation will be established here.

So, what assumptions do I make? I think that it is wrong to reconcile the Bible to science. In this book we will encounter many ideas that were once widely believed and thought beyond dispute, but were later shown to be wrong and



were discarded. On the other hand, the Bible does not change. There are many today who interpret Genesis in terms of the latest scientific theories and even fads. If the history of science is any teacher, then we must conclude that many of these ideas eventually will be discarded. If we have staked out a position that Genesis teaches these ideas, then what is to become of Genesis when these ideas are abandoned? A great concern of mine is that many Christians have wedded the creation account of the Bible to the big-bang theory, the current scientific myth of the world's creation. In a hundred years will anyone believe the big bang? If not, then what is to become of Genesis if we have tied it to the big bang?

Attempts to reconcile the Bible to modern science include, but are not limited to, the following: theistic evolution, progressive creation, the gap theory, the day-age theory, and the framework hypothesis. Theistic evolution is the belief that biological evolution, as understood by most scientists today, was God's method of creation. Progressive creationists do not believe that different kinds of creatures evolved from other kinds, but instead think that God repeatedly intervened to instantaneously create new kinds of organisms throughout time. Extinctions then acted to eliminate many of those kinds of creatures. Thus theistic evolutionists and progressive creationists agree on when various organisms came into existence, but differ on how those organisms came into existence.

Both progressive creation and theistic evolution require vast periods of time, so some accommodation for the six days of the creation week must be made. The most common approach is the day-age theory, that is, that each of the days of the creation week were long periods of time. Some who reject both theistic evolution and progressive creation still feel compelled to allow for vast ages of millions or billions of years in the earth's past. In an attempt to permit this, the gap theory is the belief that there was a long period of time between the first and second verses of Genesis chapter 1. Then the six literal days of the creation week commenced with the second verse. The gap theory appealed to many people who wanted to interpret the Bible as literally as possible, but the gap theory has increasingly fallen onto hard times with the rise of modern creation science.

In recent years the framework hypothesis has made large inroads among conservative Christians who take the Bible seriously. The framework hypothesis is the idea that the first ten chapters of Genesis are poetry, not history. As such, those chapters have rich meaning, but do

not reflect actual history. In this view, the Bible is silent on the how and when of the origin of the world, and so the believer is free to adopt whatever modern science has to say about these questions. All of these accommodations of Genesis to modern science have difficulties, a topic that will not be further developed here.[1]

What is the viewpoint of this book? The days of the creation week are best understood as literal days, not long periods of time. While the Bible does not tell us the date of creation, the strong implication is that the creation was only a few thousand years ago. There is a fairly complete chain of biblical chronologies from the creation to the time of Christ. Those chronologies add up to about 4,000 years. Adding the two millennia since the time of Christ, we determine an age of the world of about 6,000 years, though some understandings of the chronologies could stretch the age by nearly a thousand years. (Note that the precision of the Ussher chronology [4004 B.C. as the date of creation] is not possible.)

In any case, a faithful rendering of biblical chronologies will not allow for millions or billions of years for the age of the universe as demanded by modern science. Therefore, the approach that we take here is very different from the approach that nearly every other book on cosmology takes. At the time of the writing of this book, cosmologists generally estimate the age of the universe between 12 and 14 billion years. One particular study dated the age of the universe at 13.7 billion years, plus or minus 1%. We estimate the age at about 6,000 years. One would expect that this dramatic difference in estimated age must lead to tremendous differences in cosmology. Indeed, the standard big-bang model assumes a purely physical, natural origin to the universe, while we assume that God created the world and revealed some of His process of creation in Genesis. That is, the origin of the universe was a supernatural event. This difference of opinion between theism and (at the very least practical) atheism is even more profound than the age issue.

WHAT IS COSMOLOGY?

The word *cosmology* comes from the Greek words *cosmos* and *logos*, which literally mean "world" and "word." As with the names of many sciences, *logos* has been generalized to mean "study of," while *cosmos* is generally understood to mean the universe. So the word *cosmology* means the "study of the universe" as a whole. More specifically, cosmology is the "study of the structure of the universe." A related word is *cosmogony*, which refers to the "study of the history of the universe." Today the word *cosmogony* is not used much, and much of what is called cosmology is technically cosmogony.

A cosmology is a particular theory or statement about how the universe or some part of the universe operates. For instance, the heliocentric theory, the idea that the sun is the center of the solar system, is a cosmology. The geocentric theory, that the earth is the center of the solar system, also is a cosmology. The idea that stars are very distant suns is a cosmology too. Another example of a cosmology is Immanuel Kant's island universe concept. At the beginning of the 20th century, many astronomers thought that our galaxy, the Milky Way, was the only galaxy. Thus, they often referred to the Milky Way as "the universe." Many faint patches of light seen through telescopes generally were thought to be clouds

Abell 1689 is one of the most massive galaxy clusters known.

of gas within our galaxy. However, much earlier Kant had suggested that many of these faint objects were other galaxies, each containing billions of stars. Since these "universes" were separated by huge gulfs of space, they were compared to islands. This theory was eventually proven to be correct, as we shall see.

The cosmologies that will be considered in this book will be those that are concerned with the structure of the universe as a whole. Since the mid-1960s there has been one dominant cosmology: the big bang. We will examine the historical developments and observations that led to the big-bang theory. We will discuss alternatives to the big-bang cosmology, such as the steady-state cosmology and the plasma universe. Besides the physical data, we will be very concerned with how well various cosmologies conform to biblical data. Creationists have recounted many problems with the big bang, and some of those problems will be discussed here. However, it is important that creationists go beyond criticizing non-biblical or evolutionary cosmologies and develop our own positive models. Unfortunately, only meager progress to this end can be reported at this time, but avenues of possible research will be suggested.

In this introduction let us explore some more restricted cosmologies of the past. Cosmological ideas are as old as mankind. We have no idea what kind of cosmologies Adam may have had. Many people think that since Adam and his immediate descendents lived so long (in many cases nearly a millennium), the earliest people may have developed some amazing ideas and technology. There is no evidence, but it is possible that the antediluvian society may have produced some very sophisticated cosmologies. There are records of many primitive cosmologies[2] from around the world. Evolutionists usually conclude that

Chapter One

TWENTIETH-CENTURY COSMOLOGY

Modern Physics

For two centuries Newtonian physics had successes unparalleled in the history of science, but toward the end of the 19th century several experiments produced results that had not been anticipated. These results defied explanation with Newtonian physics, and this failure led in the early 20th century to what is called modern physics. Modern physics has two important pillars: quantum mechanics and general relativity. Quantum mechanics is the physics of small systems, such as atoms and subatomic particles. General relativity is the physics of very high speeds or of large concentrations of mass or energy. Both of these realms

are beyond the scope of everyday experience, and so quantum mechanical and relativistic effects are not usually noticed. In other words, Newtonian mechanics, which is the physics of everyday experience, is a special case of modern physics.

Some creation scientists view both quantum mechanics and general relativity with suspicion. Part of the suspicion of quantum mechanics stems from the Copenhagen interpretation, a philosophical view of quantum mechanics. In quantum mechanics, the solution that describes location, velocity, and other properties of a particle is a wave function. The wave function amounts to a probability function. Where the value of the wave function is high, there is a high probability of finding the particle, and where the value of the wave function is low, there is a small probability of finding the particle. This result is pretty easy to understand when one considers a large number of particles — where the probability is high there is a greater likelihood of finding more particles.

However, how is one to interpret the result when considering only a single particle? The Copenhagen interpretation states that the particle exists in all possible states simultaneously. The particle exists in this weird state as long as no one observes the particle. Upon observation we say that the wave function collapses and the particle assumes some particular state. If the experiment is conducted often enough, the distribution of outcomes of the experiment matches the predictions of the probability function derived from the wave solution.

This suggests a fundamental uncertainty about the universe that runs counter to the Christian view of the world and an omniscient God. An omniscient God would presumably know the outcome of any experiment, an idea that is supported by the pre-determined world of Newtonian mechanics. With Newtonian mechanics if one knows all the properties, such as location and velocities of particles at one time, all such properties of the particles can be uniquely determined at any other time. This ability is called determinism. It would appear that quantum mechanics leads to a fundamental uncertainty that even God cannot probe. Uncertainty usually results from ignorance, that is, we lack enough input information to be able to calculate future states of a system. However, the uncertainty introduced by quantum mechanics is not one of ignorance, and so we call this uncertainty fundamental. By "fundamental uncertainty" we mean that even if we had infinite precision of all the relevant variables, we would still fail to predict the outcome of future experiments. Possible responses to this objection are that either the Copenhagen interpretation is wrong or that quantum mechanics is an incomplete theory. Phillip Dennis[1] has argued that quantum mechanics is probably an incomplete theory and that the uncertainty is no problem for the Christian.

One objection to modern relativity theory comes from the misappropriation of the term by moral relativists. Moral relativists claim that everything is relative and that general relativity has given physical evidence of this. General relativity says no such thing. In fact, it says just the opposite, that there are certain absolutes. Even if this assertion were true, this is a specious argument. Physical laws have no bearing upon morality and ethics. Another reservation about relativity that some creationists have is its perceived intimate relationship with the big-bang cosmogony. The reasoning seems to be that if the big bang is not true, then relativity is not true either. But the big

bang is just one possible result from relativity. Creation-based cosmogonies could be generated with relativity theory, as has been attempted by Russ Humphreys.[2]

Those who doubt either or both pillars of modern physics also express discomfort with them, feeling that they just defy "common sense." However, there are many things about the world that defy common sense. For instance, the author of this book never ceases to be amazed by Newton's third law of motion, that when an object exerts a force upon another object, the second object exerts an opposite and equal force upon the first object. We shall see shortly that one of the questions addressed by general relativity is how gravitational force is transmitted through empty space. Newtonian physics simply hypothesizes that the force instantly and mysteriously acts over great distances. This too defies common sense. The important question for any theory is how well it describes reality.

Both theories of modern physics have been extensively tested in experiments and have proven to be very robust theories. These theories have been better established than almost any others in the history of science. Therefore in what follows it will be assumed that these models are correct, if not complete. Both theories play important roles in modern cosmology, but only relativity is significant in the historical development of modern cosmology, so further discussion of quantum mechanics will be deferred until the next chapter.

While many people worked on the foundation of modern relativity theory, Albert Einstein usually receives most credit. His special theory of relativity was published in 1905, followed by his general theory in 1916. The special theory is not that difficult to understand. It deals with the situations of constant speeds near the speed of light. Suppose that a space ship were moving at 60% the speed of light toward a stationary person. Now suppose that the stationary person shined a light toward the moving astronaut. One might think that if the moving observer measured the speed of the light beam, that speed would be 160% the speed of light. If, on the other hand, the space ship were moving away, one might expect that the measured speed of the light would be 40% of the normal speed of light. However, actual measurement reveals that the speed of light is a constant no matter how much the observer may be moving. This sort of result was obtained by the famous Michelson-Morley experiment in 1887. This fact was one of the first experiments that showed the failure of classical Newtonian mechanics.

Einstein took the invariance of the speed of light as a postulate and examined the consequences. He found that near the speed of light, time must slow down as compared to time measured by someone who is not moving. The length of the spacecraft must decrease as speed increases, and the mass of the body must increase with increasing speed. These effects are respectively called time dilation, length contraction, and mass increase, and all have been confirmed in numerous experiments. Incidentally, special relativity predicts that mass increases toward infinity as speed approaches the speed of light. Thus, to achieve light speed would require an infinite amount of energy. This is impossible, so no particle that has mass can move as fast as the speed of light.

General relativity is concerned with accelerated motion at high speeds. Unfortunately it requires the use of complicated mathematical abstractions, and so it is not easy to understand. While we will not discuss any mathematical detail, we will

UNIVERSE BY design

And God said, "Let there be lights in the firmament of the heaven to divide the day from the night; and let them be for signs, and for seasons, and for days, and years: . . . and God saw that it was good. — Gen. 1:14–18

The universe was created with purpose and reason; and modern science with all of its experiments, exploration, and sophistication has never proven otherwise. In fact, as author Dr. Danny Faulkner makes plain, advanced science argues more for a created cosmology than a big bang. Written for the upper-level student through the well-read layman, *Universe by Design* explores the universe, explaining its origins and discussing the historical development of cosmology from a creationist viewpoint.

Includes:

- Recent developments in cosmology
- Explanatory diagrams and illustrations
- Theories and facts on the origin and expansion of the universe
- The contributions of Ptolemy, Galileo, Brahe, Newton, Hubble, Einstein, and other famous scientists to the field
- Thorough discussion and problems with the big bang theory
- Many examples and analogies to help understand concepts of cosmology
- Difficulties and critiques of modern cosmology
- Chapter questions and answers for homeschool study

As an excellent supplement to an upper-level homeschool curriculum or the library of an astronomer — amateur or advanced — this book will inform and enlighten the scientific mind.

Master Books
A Division of New Leaf Press
www.masterbooks.net

EDUCATION K-12 / SCIENCE AND TECHNOLOGY / ASTRONOMY

$13.99 U.S.
ISBN-13: 978-0-89051-415-3
ISBN-10: 0-89051-415-1
EAN
9 780890 514153

High School to Adult