

Creation

Roger Ludin (Some of the information was paraphrased from web sources)

Day 1 – Heaven & Earth, Light, Day, Night

Day 2 – Dome over Earth, Sky

Day 3 – Dry land, Seas, Vegetation, Fruit Trees

Day 4 – Sun, Moon, Stars (Vegetation before the sun!!)

Day 5 – Birds, Sea Creatures

Day 6 – Land Creatures, Man & Woman

Day 7 – Rest

The concept of a dome separating the earth and heavens prevented people from contemplating space travel. It wasn't until Copernicus' heliocentric system said that earth was a ball in space that anyone got the idea of going to another body. The concept of space travel is a rather recent innovation in the minds of man.

Scientific Views on the Creation of the Universe and how they jibe with our beliefs.

Originally people (including Einstein) considered the universe static.

Hubble using red shifts showed that distant galaxies were moving away from us at great speeds. Like the Doppler shift when a honking horn passes.

1927, Georges Lemaître, a Belgian physicist and Roman Catholic priest, proposed that the inferred recession of the nebulae was due to the expansion of the Universe.

In 1931 Lemaître went further and suggested that the evident expansion in forward time required that the Universe contracted backwards in time, and would continue to do so until it could contract no further, bringing all the mass of the Universe into a single point, a "primeval atom" where and when the fabric of time and space comes into existence.

This gave rise to two possibilities:

Fred Hoyle - steady state Universe: new matter is created as the universe expands leading to a uniform universe. Lemaître's big bang theory – the universe is becoming less dense as it expands. In 1964 Penzias & Wilson discovered the cosmic radiation background which was strong evidence for the big bang.

Extrapolating backwards, the singularity occurred about 13.7 billion years ago – the age of the universe. This was the creation!!

The start was very dense energy and very high temperatures. Particles and anti-particles were continuously being created from the energy and destroyed in collisions. The universe grew exponentially.

Whenever a particle is created its antiparticle is also created leading to the same number of each. Something occurred to break this balance. It is called baryogenesis leading to a very small excess of matter over antimatter. Process is not truly understood. This small excess – about 1 in 30 million – resulted in the preponderance of matter over antimatter in our present universe. Were it not for this imbalance all matter would be annihilated by antimatter and there would be no solid matter.

All this occurred in less than the first picoseconds of the universe's existence. (The time it takes light to travel one millimeter.) At about a microsecond protons and neutrons came into existence. The universe was now cool enough that protons and neutrons could no longer be created so annihilation began leaving only the excess of matter.

A few minutes into the expansion the temperature was down to about a billion degrees and protons and neutrons combined to form deuterium and helium – more complex nuclei.

During the first few days of the Universe, the Universe was in full thermal equilibrium, with photons (particles of light) being continually emitted and absorbed, giving the radiation a blackbody spectrum. As the Universe expanded, it cooled to a temperature at which protons could no longer be created or destroyed. After more cooling electrons could no longer be spontaneously be created. The temperature was still high enough for electrons and nuclei to remain unbound, however, and photons were constantly "reflected" from these free charged particles. Because of this repeated scattering, the early Universe was opaque to light, i.e. dark.

When the temperature fell to a few thousand degrees, electrons and nuclei began to combine to form atoms. Since photons scatter infrequently from neutral atoms, radiation decoupled from matter when nearly all the electrons had recombined. Penzias and Wilson discovered the remnants of this radiation. This was 379,000 years after the Big Bang. This is the first light of the universe. Let there be light!!

Over time gravity coalesced particles into the stars and galaxies we see today. Our sun formed about 4.5 Billion years ago and the earth shortly after that.

An important feature of the Big Bang space-time is the presence of horizons. Since the Universe has a finite age, and light travels at a finite speed, there may be events in the past whose light has not had time to reach us. This places a limit or a *past horizon* on the most distant objects that can be observed. Conversely, because space is expanding, and more distant objects are receding ever more quickly, light emitted by us today may never "catch up" to very distant objects. This defines a *future horizon*, which limits the events in the future that we will be able to influence.

As for the future of the universe much is still unknown. Most of the mass of the universe is in the form of dark matter which cannot be seen. Many experiments are going on to detect this matter. (Called WIMPS – weakly interacting massive particles.) How much mass exists in dark matter is

not known. If there is not too much then the universe will keep expanding and cooling and die with a whimper and not a bang. If there is a lot of this matter then gravitation will slow down the expansion and begin a contraction where everything reverses back to a point in what is affectionately known as the big crunch.

The Big Bang is a scientific theory, and as such is dependent on its agreement with observations. But as a theory which addresses the origins of reality, it has always carried theological and philosophical implications, most notably, the concept of creation *ex nihilo* (out of nothing). In the 1920s and 1930s almost every major cosmologist preferred an eternal steady state Universe, and several complained that the beginning of time implied by the Big Bang imported religious concepts into physics. This perception was enhanced by the fact that the originator of the Big Bang theory, Monsignor Georges Lemaître, was a Roman Catholic Christian priest. In 1951, Pope Pius XII declared that the Big Bang theory accorded with the Catholic concept of creation. Conservative Protestant Christian denominations have also welcomed the Big Bang theory as supporting a historical interpretation of the doctrine of creation.

Since the acceptance of the Big Bang as the dominant physical cosmological paradigm, there have been a variety of reactions by religious groups as to its implications for their respective religious cosmologies. Some accept the scientific evidence at face value, while others seek to reconcile the Big Bang with their religious tenets, and others completely reject or ignore the evidence for the Big Bang theory.

There are many misconceptions surrounding the Big Bang theory. For example, we tend to imagine a giant explosion. However, there was no explosion; there was (and continues to be) an expansion. Rather than imagining a balloon popping and releasing its contents, imagine a balloon expanding: an infinitesimally small balloon with all the stars and galaxies on the surface expanding to the size of our current universe.

Another misconception is that we tend to image the singularity as a little fireball appearing somewhere in space. However, space didn't exist prior to the Big Bang. Time and space had a finite beginning that corresponded to the origin of matter and energy. The singularity didn't appear *in* space; rather, space began inside of the singularity. Prior to the singularity, *nothing* existed, not space, time, matter, or energy - nothing. So where and in what did the singularity appear if not in space? We don't know. We don't know where it came from, why it's here, or even where it is. All we really know is that we are inside of it and at one time it didn't exist and neither did we.

Cosmology (the study of the origin of the universe) is an area where science and theology meet. Although the big bang does not agree literally with the Biblical creation account, it still has a Creation. Creation was a supernatural event. That is, it took place outside of the natural realm. This fact begs the question: is there anything else which exists outside of the natural realm? Specifically, is there a master Architect out there? We know that this universe had a beginning. Was God the "First Cause"? The big bang theory calls for a creation and does not explain what caused the singularity and the theory can exist alongside the concept of God.