THE SEARCH FOR THE BEGINNING

Cosmologists have systematically reversed the chronology of the Universe, much as we would run a home movie in reverse, to find the instant of birth in the Big Bang. At that point, however, there is no longer any past from which to learn. All evidence had to have been destroyed in the unimaginable heat and light of that initial blast. Physicists can measure forces and particles; they cannot measure nothingness.

Consider for a minute the problem faced by scientists as they attempt to construct models of the early Universe. At first, the process is on sound scientific grounds. Theoretical physicists have constructed a mathematical model to test. Most importantly, astronomers can make actual observations. They can take actual pictures of our more recent past. Due to the speed of light and the vast distances involved in the heavens it is possible to see a picture of an event that occurred, for instance, two billion years ago in a distant galaxy. An analogy may be useful.

During a thunderstorm you notice that lightning flashes dramatically in the sky. A few moments later you hear the crashing sound of thunder. This tells you that:

1. An event happened -- the electrical discharge of the cloud.
2. The light from this event traveled to your eyes.
3. The sound from this event traveled to your ears.
4. You saw the light before you heard the thunder.

A scientifically correct conclusion is that light travels faster than sound.

Suppose that you are inside a house on a dark and rainy night. The curtains are drawn and you cannot see outside. But you hear the sound of thunder. Is the instant you hear the sound the same instant that the event is taking place? No, your ears are telling you of an event that took place in the past, at least a few seconds before you heard the thunder. This is because it took time for the sound waves to travel from the storm cloud to your ears.

The speed of sound is relatively slow: 1088 feet per second. The speed of light is unbelievably fast: 186,000 miles per second. This means that if an event occurred 186,000 miles away, we would see it one second later. The light we see on the Earth from the Sun was actually generated on the Sun about eight minutes earlier.