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"BIG BANG" OR "BIG CRUNCH"?

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The origin and destiny of the Universe always have been important topics in the creation/evolution controversy. In the past, evolutionists went to great extremes to avoid scenarios that suggested a Universe with a beginning or ending, because such scenarios posed bothersome philosophical questions ("What came before the beginning?" or "What will come after the ending?"). Only theories that guaranteed an eternal Universe were worthy of consideration.

BACKGROUND

One theory offered in an attempt to establish the eternality of the Universe was the Steady State model of Sir Fred Hoyle and his colleagues. Even before he offered this unusual theory, however, scientific evidence had been discovered which indicated that the Universe was expanding. Hoyle set forth the Steady State model to: (a) erase any possibility of a beginning; (b) bolster the idea of an eternal Universe; and (c) explain why the Universe was expanding. His idea was that at certain points in the Universe (which he labeled "irtrons"), matter was being created spontaneously **from nothing**. Since this new matter had to "go" somewhere, and since two objects cannot occupy the same space at the same time, it pushed the matter that already existed further into distant space. Hoyle asserted that this process of matter continually being created (the idea even came to be known as the "continuous creation" theory) avoided any beginning or ending, and simultaneously accounted for the expansion of the Universe.

For a time, Hoyle's Steady State hypothesis was quite popular. Eventually, however, it was discarded for several reasons. Cosmologist John Barrow suggested that the Steady State theory sprang "from a belief that the universe did not have a beginning.... The specific theory they proposed fell into conflict with observation long ago" (1991, p. 46). Indeed, the Steady State theory did fall "into conflict with observation" for a number of reasons. First, new theoretical concepts being proposed at the time were completely at odds with the Steady State model. Second, empirical observations no longer agreed with the model (see Gribbin, 1986). And third, it violated the First Law of Thermodynamics, which states that neither matter nor energy may be **created** or destroyed in nature. Therefore, the Steady State model was abandoned.

The Big Bang model replaced the Steady State theory by postulating that all the matter/energy in the observable Universe was condensed into a particle smaller than a single proton (the famous "cosmic egg"). The Big Bang model, however, suffered from at least two major problems. First, it required that the "cosmic egg" be eternal—a concept clearly at odds with the Second Law of Thermodynamics. John Gribbin, a highly regarded evolutionary cosmologist, voiced the opinion of many when he said: "The biggest problem with the Big Bang theory of the origin of the Universe is philosophical—perhaps even theological—what was there before the bang?" (1976, pp. 15-16).

Second, the expansion of the Universe could not go on forever; it had to end somewhere. The Universe had a beginning, and would have an ending. Robert Jastrow has addressed both of these points: "And concurrently there was a great deal of discussion about the fact that the second law of thermodynamics, applied to the Cosmos, indicates the Universe is running down like a clock. If it is running down, there must have been a time when it was fully wound up" (1978, pp. 48-49). Matter could not be eternal, because eternal things do not run down. Furthermore, there was going to be an end at some point in the future.

Such a scenario is unacceptable to evolutionists. Jastrow himself admitted: "Astronomers try not to be influenced by philosophical considerations. However, the idea of a Universe that has both a beginning and an end is distasteful to the scientific mind" (1977, p. 31). To avoid any vestige of a beginning, or any hint of an ending, evolutionists invented the Oscillating Universe model (also known as the Big Bang/Big Crunch model, the Expansion/Collapse model, etc.). Dr. Gribbin suggested: "[T]he best way around this initial difficulty is provided by a model in which the Universe expands from a singularity, collapses back again, and repeats the cycle indefinitely" (1976, pp. 15-16).

That is to say, there was a Big Bang; but there also will be a Big Crunch, at which time the matter of the Universe will collapse back onto itself. There will be a "bounce," followed by another Big Bang, which will be followed by another Big Crunch, and this process will be repeated *ad infinitum*. In the Big Bang model, there is a permanent end; not so in the Oscillating Universe model, as Dr. Jastrow explained:

> But many astronomers reject this picture of a dying Universe. They believe that the expansion of the Universe will not continue forever because gravity, pulling back on the outward-moving galaxies, must slow their retreat. If the pull of gravity is sufficiently strong, it may bring the expansion to a halt at some point in the future.
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> What will happen then? The answer is the crux of this theory. The elements of the Universe, held in a balance between the outward momentum of the primordial explosion and the inward force of gravity, stand momentarily at rest; but after the briefest instant, always drawn together by gravity, they commence to move toward one another. Slowly at first, and then with increasing momentum, the Universe collapses under the relentless pull of gravity. Soon the galaxies of the Cosmos rush toward one another with an inward movement as violent as the outward movement of their expansion when the Universe exploded earlier. After a sufficient time, they come into contact; their gases mix; their atoms are heated by compression; and the Universe returns to the heat and chaos from which it emerged many billions of years ago (1978, p. 118).

The description provided by Dr. Jastrow is that commonly referred to in the literature as the "Big Crunch." But the obvious question is—after that, then what? Again, Jastrow explained:

> No one knows. Some astronomers say the Universe will never come out of this collapsed state. Others speculate that the Universe will rebound from the collapse in a new explosion, and experience a new moment of Creation. According to this view, our Universe will be melted down and remade in the caldron of the second Creation. It will become an entirely new world, in which no trace of the existing Universe remains....
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> This theory envisages a Cosmos that oscillates forever, passing through an infinite number of moments of creation in a never-ending cycle of birth, death and rebirth. It unites the scientific evidence for an explosive moment of creation with the concept of an eternal Universe. It also has the advantage of being able to answer the question: What preceded the explosion? (1978, pp. 119-120).

COMMENTS

Several questions arise. First, of what benefit would such events be? Second, is such a concept testable scientifically? Third, does current scientific evidence support such an idea?

Of what benefit would a Big Bang/Big Crunch/Big Bang scenario be? **Theoretically**, as I have noted already, the benefit to evolutionists is that they do not have to explain a Universe with absolute beginnings or endings. A cyclical Universe that expands and contracts infinitely is much more acceptable than one that demands explanations for both its origin and destiny. **Practically**, there is no benefit that derives from such a scenario. Astronomer Carl Sagan of Cornell University noted:

> ...information from our universe would not trickle into that next one and, from our vantage point, such an oscillating cosmology is as definitive and depressing an end as the expansion that never stops (1979, pp. 13-14).

Could the Oscillating Universe model be tested scientifically? Gribbin felt that it could.

> The key factors which determine the ultimate fate of the Universe are the amount of matter it contains and the rate at which it is expanding.... In simple terms, the Universe can only expand forever if it is exploding faster than the "escape velocity" from itself.... If the density of matter across the visible Universe we see today is sufficient to halt the expansion we can observe today, then the Universe has always been exploding at less than its own escape velocity, and must eventually be slowed down so much that the expansion is first halted and then converted into collapse. On the other hand, if the expansion we observe today is proceeding fast enough to escape from the gravitational clutches of the matter we observe today, then the Universe is and always was "open" and will expand forever (1981, p. 313).

Does scientific evidence support the theory of an "oscillating" Universe? The success or failure of this theory depends, in part, on the amount of matter contained in the Universe, since there must be enough matter for gravity to "pull back" to cause the Big Crunch. This is one reason why cold dark matter is so important. Dr. Gribbin has said: "This, in a nutshell, is one of the biggest problems in cosmology today, the puzzle of the so-called missing mass" (1981, pp. 315-316). In discussing the Oscillating Universe model, astronomers speak of a "closed" or an "open" Universe. If the Universe is **closed**, theoretically the Big Crunch could occur, and an oscillating Universe becomes a viable possibility. If the Universe is **open**, the expansion of the Universe will continue and the Big Crunch will not occur, making an oscillating Universe impossible. Joseph Silk remarked: "The balance of evidence does point to an **open** model of the universe" (1980, p. 309, emp. added). Gribbin commented: "The consensus among astronomers today is that the universe is **open**" (1981, p. 316, emp. added). Jastrow observed: "Thus, the facts indicate that **the universe will expand forever**" (1978, p. 123, emp. added). Recent evidence seems to indicate that an oscillating Universe is a physical impossibility (see Chaisson, 1992).

Evolutionary cosmologist John Wheeler has drawn the following conclusion based on the scientific evidence: "With gravitational collapse we come to the end of time. Never out of the equations of general relativity has one been able to find the slightest argument for a 're-expansion' of a 'cyclic universe' or anything other than an end" (1977, p. 15). As Ross has admitted: "Attempts ...to use oscillation to avoid a theistic beginning for the universe all fail" (1991, p. 105). No one yet has improved on Genesis 1—"In the beginning, God created...."

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