THE BIG BANG TO US

Every culture has had its "origin story," its story about how the world began. The oldest preserved story of the creation of the universe is *Enuma Elish* ("The World Above"), dating back to the Old Babylonian Period (around 1900 – 1600 BC). The *Enuma Elish* is a mythological work, replete with anthropomorphic gods and their exploits. The first tablet begins at the beginning:

> *When a sky above had not yet*
> *even been mentioned*
>
> *And the name of firm ground below*
> *had not yet even been thought of;*
>
> *When only primeval Apsu, their begetter,*
>
> *And Mummu and Ti'amat – she*
> *who gave birth to them all –*
>
> *Were mingling their waters in one;*
>
> *When no bog had formed and*
> *no island could be found;*
>
> *When no god whosoever had appeared,*
>
> *Had been named by name, had*
> *been determined as to his lot,*
>
> *Then were gods formed within them.*

Theories of the Universe, ed. Milton K. Munitz (*New York: The Free Press*, 1957), pg. 9.

Some of the first gods formed were Anu, the god of the sky, Nudimmut, the god of water, and Enlil, the god of wind and earth. Thus, the ancient Babylonians viewed the universe as made of these fundamental elements. At some point, the hero of the story is born, Marduk, a god of storm and thunder. Marduk does battle with Ti'amat and her army. When he triumphs, Marduk crushes her skull, drains her arteries,

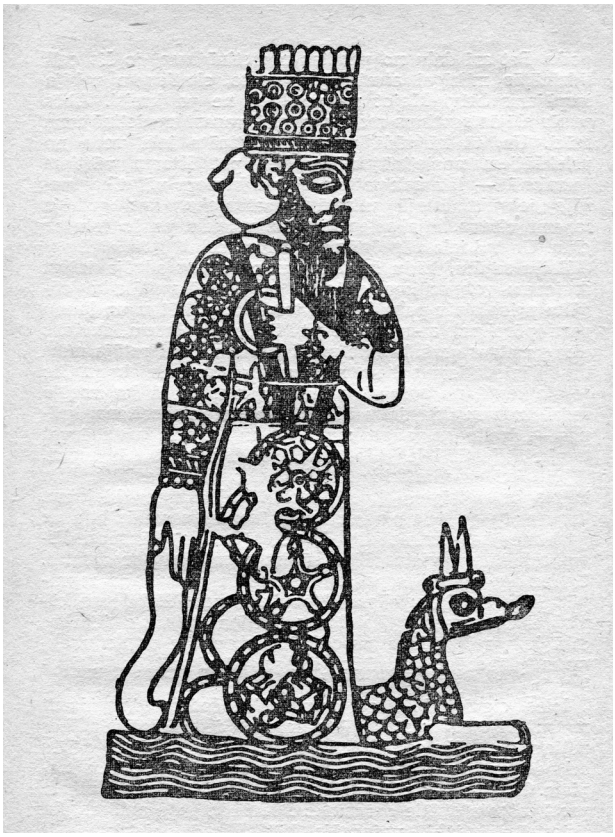

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Illustration of Marduk, the mythological Babylonian god of storm and thunder, with the dragon Mushhushshu.

and with his axe cuts her body in two. Half of the body he lifts up to form the sky, the other half remains to form the water and earth.

Modern scientists have their own creation story, called the Big Bang. Unlike the mythological stories in earlier times, the Big Bang story is supported by a great deal of scientific evidence, including the observed expansion of the universe; the observed radio waves from the Big Bang; and the measured ratio of helium

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to hydrogen in the universe, determined by conditions in the first three minutes of its existence. The scientific story of the creation and evolution of the universe also explains how stars and solar systems are formed. In the twentieth century, astronomers and physicists learned that the universe is vast, with a hundred billion stars and their solar systems just in our galaxy, the Milky Way, and a hundred billion galaxies within range of our telescopes.

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With so many solar systems in the vast reaches of space, it would seem likely that other life forms might have arisen. Some of them could be far more intelligent than us human beings.

Long before modern times, ancient thinkers such as the Greek philosophers Democritus and Epicurus in the fourth century BC speculated that there are innumerable worlds beyond our planet, some of them populated with other living creatures. Indeed, the possibility of "extraterrestrial life" beyond Earth has intrigued the human imagination for thousands of years. With so many solar systems in the vast reaches of space, it would seem likely that other life forms might have arisen. Some of them could be far more intelligent than us human beings.

So far, we have not detected any life beyond planet Earth, but since the late 1990s, a new field of science called astrobiology has been devoted to the search. Questions abound, whether we find such life or not. If we are alone in the universe, that fact would have great philosophical and even theological implications. And if we are not alone, who are these extraterrestrial beings? Where are they? Will we be able to communicate with them? What do we share in common? What can we learn from them?

It could turn out that the distances between solar systems are so great that we may never be able to contact other planetary civilizations even if they exist. In that case, we will keep asking the question: "Are we alone?" without ever knowing the answer.