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The March of the Martians

BOOM! A massive spaceship comes crashing down, blasting lasers. Martians march out their spacecraft and panic spreads like a wildfire as everyone evacuates the city- wait. Martians don't exist... do they? The nonfiction book, *Cosmos* by Carl Sagan answers this compelling question through the exploration of lab experiments and theories in my favorite chapter, "Blues for a Red Planet", which discusses Mars and the existence of Martians, which have been long debated.

This chapter begins by explaining why Martians are the most questioned and wondered about forms of extraterrestrial life. Why not Plutonians, or Saturnians? The first reason is that "Mars seems, at first glance, very Earth-like" (Pg. 109). If Earth can support life, maybe Mars could too. In his observatory in Flagstaff, Arizona, the astronomer Percival Lowell believed that he could see canals transporting water from the polar ice caps to Martian cities. Lowell thought that Mars' surface was like the American Southwest desert, the weather like "the South of England": the air thin but still breathable, and water was rare, although an intricate canal system brought water from ice caps to inhabitants. However, after further review, Lowell had miscalculated the temperature; instead of Southern England climate, the temperatures on Mars in most places was below freezing, the air was also much thinner than calculated by Lowell, and any attempt in trying to transport that little amount of water would end with the water either evaporating or soaking into the ground.

Next, Carl Sagan describes one of his projects, the Mars Jars. The Mars Jars were small chambers that simulated the conditions on Mars to see if life could survive on it. Inside the Mars Jars, noon was just over freezing while dawn was around -80°C (-112°F). The atmosphere was

carbon dioxide and nitrogen. Ultraviolet lamps were used to simulate the amount of solar flux on Mars, which is the amount of light being radiated. There was no liquid water except small traces on some of the sand grains. Sagan and his colleagues would then put microbes into the chambers to test whether they could handle the Martian conditions. Some froze to death, some died from lack of oxygen, others died from thirst, or fried up in the ultraviolet light. However, when a small amount of liquid water was added to the jars, some of the microbes began to grow. Some microbes that didn't require oxygen could retreat under pebbles from the ultraviolet light and hide from dropping temperatures.

In conclusion, "Blues for a Red Planet" has been the most interesting part of any non-fiction book I have read because it discussed Martians, Percival Lowell's theory, and the Mars Jars. I thought that Lowell's theory was very believable because of how in-depth it went and that people finding a way to simulate Mars in the Mars Jars was incredible. Although *intelligent* life on Mars may not exist, there is still a possibility of life on the surface of the mysterious red planet.