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Creative Nonfiction

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Look Up

When we look at the night sky 40 miles from city lights, we see lights trapped in blackness. We see little white dots scattered without structure or pattern. The dots sit still and we are still, yet we see disorder. We marvel, we sigh, we ooh and we ahhh at the twinkling dots. But, there is so much we do not see. We do not realize the stars do not actually twinkle. The popular childhood song is wrong. The truth is stars do not twinkle and they are not little. The Hubble Space Telescope confirmed this fault in the lullaby. NASA launched the telescope into orbit in April 1990. The Hubble was the first telescope to look at space outside the earth's atmosphere, and this perspective established that turbulence within the atmosphere distorts our view of the stars, causing them to only appear as if they are twinkling. Disenchanted as that discovery might be, it is the truth.

The Hubble's many discoveries have changed mankind's relationship with outer space, but it was not the beginning. Long before the Hubble parted with Earth, a spectacle maker, Hans Lippershey, made a significant advancement in Holland in 1608. Lippershey developed the earliest recorded form of the refracting telescope, magnifying objects to three times their size. Lippershey's patent stated, "for seeing things far away as if they were nearby." The concept seems trivial. He created a way to zoom in. But consider, the people of that era never had to distinguish something as life-size or not. Then one day, a man creates a cylinder and establishes everything is not as it seems.

In 1609, after hearing of Lippershey's device, Galileo Galilei invented a telescope which magnified objects twenty times their size. Although Galileo never saw Lippershey's invention, he improved it, but more significantly, he pointed it at the sky. He looked up. One simple motion transformed human understanding of the world and everything beyond it. Even though the merit and impact of these men and their inventions is admired, they are not always understood. A metal tube magically brings our eye closer to an image without us moving our body, and we just accept it.

Telescopes come in many forms, but there are two basic types: refracting and reflecting. Lippershey and Galileo's designs are a form of the refracting telescope. Lippershey used two convex lenses and Galileo used one convex lens and one concave lens. They used lenses because lenses accept more light than the human eye can, and when light travels through a medium it can slow down and change angle to make the image visible to the human eye. However, in 1668, Newton created the first reflector telescope. Newton replaced the convex lens with a rounded mirror. The rounded mirror reflects the light rays to a central point rather than bending the light, which can form rainbows or fuzziness around the image.

The Hubble Space Telescope uses a primary and secondary mirror, similar to Newton's, but with modern adjustments and instruments receiving the image rather than a human eye. The Hubble is responsible for hundreds of discoveries including determining the age of the universe. Scientists used to estimate the universe as 10 to 20 billion years old -- not the accuracy the world hoped for. Images and calculations from the Hubble increased the accuracy of the estimate to 13.7 billion years. If that does not make you feel young, nothing can. The Hubble also found 3,000 galaxies in a small, black piece of space. The little area was predicted to have nothing, but

scientists made the bold decision to focus the Hubble on it for ten days. They were wrong. The universe may be endless and black and deep, but there is not nothing.

Lippershey and Galileo opened our eyes, and the Hubble looked up and looked farther exposing us to reality. The stars do not actually twinkle and many of them are already dead. The infinite space is not just space. There are over 200 billion stars, and over 100 billion galaxies in that space. We are small, not alone, temporary, and sometimes we fall just like the stars. We do not know everything and never will, and we are forced to accept that. The telescope is not just responsible for how man sees or what man knows. The telescope is responsible for how man feels beneath that big, silent, crowded night sky.

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