Lowell Milken Center for Unsung Heroes
ARTEFFECT

Impact Statement

Seokhyun Chin – Grade 11
Flower atop the mountain that blooms in adversary, 2024.
Watercolor on canvas board, 38.5 x 27.4 inches.
Choate Rosemary Hall, Seoul, Republic of Korea
Unsung Hero: Cecilia Payne-Gaposchkin

It is well known that Copernicus caused a revolution in scientific thought by arguing that the sun, not the earth, is the center of the solar system. However, the scientist who first claimed that unlike Earth's atmospheric composition, the sun consists primarily of hydrogen is not well known. It is very important to celebrate "unsung heroes" who made significant contributions to science but did not receive proper recognition. By doing so, we can amplify their contributions, preserve their memories, and guide the future through their stories. In this regard, I want to introduce the astronomer Cecilia Payne-Gaposchkin.

Born into a poor, single-parent family, Payne majored in physics at Cambridge University but was denied a doctoral degree because she was a woman. However, Harlow Shapley, then head of the Radcliffe College observatory, gave her a chance to pursue her studies. Payne moved to Radcliffe College in the U.S., where she became the first woman to earn a Ph.D. in astronomy. For her thesis, Payne essentially built upon the Henry Draper spectral catalog and Meghnad Saha's theory of thermal ionization to figure out the composition of stars through the spectra she obtained. Although her initial thesis was that the sun is composed of hydrogen, scientists at the time believed that the sun and Earth were composed of the same materials. For this reason, she had to modify her paper to conclude that "it appears so, but it would be difficult to be actually composed that way." Nevertheless, Payne's contributions were not recognized until four years later; Russell, the famous astronomer who reviewed her paper and initially disagreed with her conclusion, eventually acknowledged her contributions. Following this, she continued her passionate research activities, including studying variable stars, and eventually gained recognition for her achievements with the help of many scholars. She became the first female professor at Harvard University, winning several awards. Payne's story emphasizes academic passion and intellect, undeterred by prejudice. Her efforts have greatly influenced future astronomers, and her life, filled with passion and determination for academia, inspires us all.

I wanted to create an artwork that conveys Cecilia Payne's adversities and determination through a visual poster. I chose the dark and vast universe to set the mood and place of the work. I added variable stars to show the sky's wonders, representing Payne's effort in classifying tens of thousands of them. Additionally, to depict her academic achievements, I illustrated her progression from studying physics

at Cambridge to expanding her knowledge in astronomy, including her research topics such as the abundance and chemical homogeneity of cosmic elements through the spectral analysis of starlight. The hands below Cecilia can be interpreted in two ways: either hands reaching out to hold her back, signifying the various obstacles she faced, thereby emphasizing her determination and resolve, or as hands reaching out to support her, symbolizing everyone who helped her build her legacy. I also added the faces of people without whom she would not have been able to make her contributions: Harlow Shapley, Meghnad Saha, and Henry Draper. However, I made her face the most prominent to signify that she is the central figure of the poster.

Cecilia's unique achievements contributed to the advancement of astronomy despite adverse social attitudes, prejudices, and family opposition, playing a significant role in shaping the current society's move toward space. She conveyed a very meaningful message to young scientists that the reward lies in being the first and seeing the overall hope of the world. Inspired by Payne's sacrifices and determination, I created an art poster to commemorate her life and widely share it through student NGOs and school art and science clubs, thereby positively influencing the community. Cecilia's story inspires us greatly, and we should aim to remember her sacrifices and achievements, hoping that more people with her courage and determination will emerge in our society, brightening our future.