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Aurora Borealis — not BORE-alis!

The Northern Lights' Ancient Legends and Scientific Wonders

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Look! Streaking across the sky in vibrant colors — red, purple, blue, pink, green — is a phenomenon that has garnered the attention of cultures and individuals for hundreds of years. The northern lights have inspired many communities' myths and imaginations throughout history. The name itself declares a connection to ancient societies: "aurora borealis" is respectively "sunrise" and "wind" in Ancient Greek. The lights' immersion in deep and ancient history is fascinating. What legends have the lights inspired? What is the science behind the phenomena?

First, it is pertinent to note their geographical location. There are two kinds of polar lights: southern and northern, located in their respective hemispheres. This article will focus on the latter. The polar lights are consistently visible near the Earth's two poles, which makes areas like Greenland and Antarctica prime viewing locations. However, they are sometimes visible near the equator and have been noticed as far away as Mexico.

Now that geography is out of the way, let us move on to the aurora borealis' exciting tales. Long ago, Vikings connected the lights to Norse mythologies — stories you might recognize from the Marvel Cinematic Universe. They believed the lights were reflections of Valkyries, female warriors donning their armor and leading soldiers to their Asgardian ruler Odin. Unlike the Vikings, the Sámi people indigenous to northern Europe considered the lights to be souls of the dead, a bad omen that demanded fear and respect. According to them, teasing the lights was forbidden, and you would be carried into the sky if you caught their attention. Moving onto Finland, the lights are known as "revontulet" or "fox fires," an apt name reflecting the folklore entailing arctic foxes' tails

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running across skies, creating sparks by brushing against mountains. In Icelandic folklore, they are said to ease pain associated with childbirth. But, if a pregnant woman sees them, her child will be cross-eyed. Whereas in Greenland, the lights were interpreted to be spirits of babies who died in childbirth, and in Norway, they were souls dancing in heaven, waving to Earth.

The lights were rarely visible further south in Europe and were considered an evil omen when seen. At the French Revolution's onset, a bright red aurora was seen in England and Scotland, foretelling death and war — locals heard armies battling in the sky. The Scottish named the lights "merry dancers," but do not be fooled by the cheerful wording; the nickname references angels falling in battle.

Unlike the Scottish, to Estonians, the lights were sleighs in heaven escorting wedding guests. To Danish people, the lights

were swan wings flapping, creating flurries of lightning when caught in the ice. Contrarily, fishermen in Sweden considered the lights to be a good omen, as they reflected giant herring schools nearby. Drawing back to mythology, in Greco-Roman times, an aurora was Dawn's personification, the Sun and Moon's sister, in a chariot racing across the sky to alert her siblings of a new day.

Many North American legends were based on the lights being souls of the dead. To some tribes, the lights were spirits' torches, moving the deceased from Earth and whistling to communicate, often answered with revered whispers. Some tribes summoned the lights to converse with dead ancestors. The Cree people native to North America accepted this belief; dogs barked at the lights in recognition of lost companions. On the other hand, Algonquin tribes believed the aurora reflected the fire that Nanabozho, Earth's creator, lit to notify his people he remembered them. For the Menominee of the modern-day Midwest, they were torches from giants' fishing expeditions, and for Greenland's Inuit, they were mostly dead spirits playing with a walrus skull. Alternatively, the lights were an omen of war, encompassing spirits of slain enemies rising for revenge. Similarly, Alaskan Inuit communities feared the light's evil spirits and carried knives for protection.

After understanding the lights' legends, now the science behind them can be explored. A protective magnetic field surrounds the Earth, and the sun constantly releases electrically charged particles contributing to solar winds and the rare solar storm. The sun's outer atmosphere, the corona, is surrounded by streamers of particles flowing out of the atmosphere and feeding the solar winds. Some of the sun's highly-charged particles travel a few days, around 150 million kilometers, and reach Earth's magnetosphere. There, the magnetic field wards off particles seeking to enter; however, some particles leak through in a strong solar wind. Responding to the intrusion, the field contracts — imagine the effect of squeezing a blown-up balloon. The particles then funnel to magnetic poles, the aurora ovals. The particles' collision with our atmospheric gasses — oxygen and nitrogen — excite the molecules and cause an emission of excess energy as colors — nitrogen as turquoise, blue, purple, mauve, and pink; oxygen as green and red — in their return to a lower energy state. The light's wave-like pattern is the magnetic field's shape reforming itself after the pressure is removed from the initial attack of particles; the particles inside follow the reformation, conforming into a wave-like pattern.

The aurora borealis is a phenomenon that has inspired superstitions and myths for dozens of ancient and modern cultures. From wandering spirits to the reflection of red herring schools, the lights have inspired communities' wonder and stoked curiosity for generations. Scientifically, the lights are possible because of a collision of particles and Earth's atmospheric gasses. Whether looking at mythology or science, these winding lights in wave-like patterns of red, green, turquoise, blue, and purple never cease to take one's breath away. ◆ ◆ ◆