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Historia Borealis

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THE NORTHERN LIGHTS

The True Story of the Man Who Unlocked the Secrets of the Aurora Borealis

By Lucy Jago

Knopf. 297 pp. \$ 24 For millennia the glowing streams of green-white light were a mystery of nature. Norse epics referred to the dancing arcs as the light that blazes like a living flame. The Lapps, who feared its appearance as a message of bad news from the gods, avoided the tinkling of bells or waving of handkerchiefs lest the light attack them. Galileo named it the aurora, Latin for "dawn," because of its rosy hue whenever it extended to the lower latitudes.

Partly because of the extreme conditions that had to be endured to carry out scientific tests on the phenomenon, it wasn't until the turn of the 20th century that the basic mechanism behind the aurora could be explained. In the opening chapters of "The Northern Lights," British journalist Lucy Jago grippingly writes of Norwegian physicist Kristian Birkeland's journey with several young assistants in 1899 to a mountaintop observatory in the northernmost reaches of Norway, during which they experienced frostbite, week-long blizzards and months of sunless winter desolation. There he verified that the aurora was not light bouncing off icebergs floating in polar seas but rather an electrical phenomenon triggered by solar activity. Birkeland's claims were strengthened by a more extensive survey in the winter of 1902 that involved four observation stations set up around the Arctic Circle in Russia, Iceland and Norway.

Birkeland was brilliant and eccentric. An avid Egyptophile, he often wore a fez and red leather slippers with pointed toes. He was highly controversial in his day, yet is now hardly remembered outside his native country, where his image graces Norway's 200-kroner bank note. More than a physicist, he was also an inveterate inventor. His ambitious schemes to study the northern lights, including the construction of gigantic vacuum tanks for creating artificial auroras in his laboratory, cost far more than his university could afford. His own business ventures financed his scientific research. He first designed an electromagnetic cannon, which comically exploded during a well-publicized

demonstration; the failure inspired him to conceive of using a plasma arc to make artificial fertilizer, a far more lucrative enterprise.

A workaholic, he forgetfully scheduled a lecture the same day as his wedding (not surprisingly, his wife divorced him eight years later). He was also a manic-depressive who increasingly depended on drink and drugs to curb his anxieties. To ease his failing health, he eventually traveled to his beloved Egypt, where he spent his final years studying the zodiacal light, falling in love with a tubercular diva and growing ever more paranoid. At the age of 49, he died of a drug overdose in Japan while traveling back home via Asia after World War I.

Unfortunately, after the book's promising start, Jago largely writes this quirky story in the style of a period romance novel. Mountains soar into the bright blue sky, capes are flung over shoulders, and burning spirits are not simply drunk but tossed into mouths. The author admits in an opening note that she "telescoped events" and "made assumptions that are not documented" to prevent the book from becoming an academic text. But with no footnotes, it's hard to distinguish between established fact and a writer's imaginings. What results is biography lite, the Hollywood version of a scientist's life filled with high drama and "Eureka!" moments that don't ring true. She writes, "Stranded in the darkness on the mountain in howling gales, Birkeland thought continuously upon the connection between sunspots and auroras. . . . Without warning, one evening suddenly the muddle cleared and the pieces came together to form a solution." In truth, Birkeland initially thought of his auroral currents three years before his first expedition and planned the observations to test his hypothesis. He envisioned electrified particles from an active sun directly funneling onto Earth's magnetic poles and energizing atmospheric atoms like a neon sign, just as the beam of electrons in a cathode ray tube is guided by magnetic field lines. Although scientists now know the pathway is more complex than that, it was an ingenious conjecture to start off with, and his observational runs seemed to back it up.

Curiously, Jago tells us almost nothing about Birkeland's early childhood and college training. We don't learn at all how he came to be so passionate about physics or why the northern lights became his obsession. Despite the book's title, Jago seems to devote more pages to Birkeland the entrepreneur. She describes locales and settings in well-researched detail but barely explores the inner workings of Birkeland's scientific mind.

The leading physicists of his day virtually ignored his radical theories on the aurora, a fact that Jago attributes to sheer obstinacy and shortsightedness. But she neglects to note that some of his ideas were downright silly (planets forming under the influence of magnetism, for example) and that his more viable theories presented problems in physics that could not be adequately solved until Space Age satellites enabled scientists to gather data beyond the Earth. Birkeland the scientist deserves a richer, more complete biography to show exactly how he came to be decades ahead of his time.

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