

Celestial sleuths track historic meteor procession to South Atlantic

January 24 2013, by Jayme Blaschke



This painting by artist and amateur astronomer Gustav Hahn depicts the meteor procession of February 9, 1913, as observed near High Park in Toronto. Hahn estimated that the fireballs passed about halfway between Rigel and the Belt of Orion. University of Toronto Archives (A2008-0023), © Natalie McMinn

(Phys.org)—A century ago, one of the most spectacular astronomical sights ever recorded lit up the skies when a grand procession of meteors blazed their way through the Earth's atmosphere. The event made headlines from Toronto to Pennsylvania and New York, and in the days that followed eyewitness reports poured in from as far away as Western

Canada and Bermuda.

Now, on the 100th anniversary of the historic event, astronomers Don Olson of Texas State University and Steve Hutcheon of the Astronomical Association of Queensland, Australia, have answered a long-forgotten call for more information from the pages of the science journal *Nature*, establishing a far greater range for the great [fireball](#) procession than previously known.

Olson and Hutcheon publish their findings in the February 2013 issue of [Sky & Telescope](#) magazine, on newsstands now.

A meteor procession occurs when an Earth-grazing meteor breaks up upon entering the atmosphere, creating multiple meteors traveling in nearly identical paths. Instead of plunging down through the [atmosphere](#) and burning up within a second or two, as often observed in normal meteor showers, the fireballs in meteor processions travel almost horizontally, nearly parallel to the Earth's surface. Each member of a meteor procession can remain visible to a single observer for about a minute, and the entire procession can take several minutes to pass by.

On the evening of Feb. 9, 1913, the dazzling procession of meteors crossed over Canada and the Northeastern United States traveling northwest to southeast. University of [Toronto](#) astronomer Clarence A. Chant collected accounts from the astonished eyewitnesses and summarized, "To most observers the outstanding feature of the phenomenon was the slow, majestic motion of the bodies; and almost equally remarkable was the perfect formation which they retained." Hundreds of meteors were observed as far west as Saskatchewan, Canada, around 7 p.m. Mountain Time, and as far east as Bermuda at around 10 p.m. Atlantic Time, a distance of more than 2,400 miles. In the years that followed, additional reports from a town in Alberta, Canada, and a ship off the coast of Brazil extended the confirmed range

of the meteor procession to more than 6,000 miles.



The red dots mark locations where the meteor procession of February 9, 1913, was observed. The accounts from the ships at latitudes south of the S.S. Newlands were discovered during the preparation of this article. The ground track, projected onto the rotating Earth, deviates somewhat from a great circle, with the southern part of the track shifted several degrees to the west because of the rotation of the Earth during the time of flight from Canada to the shipping lanes below the equator. To travel so far around the curvature of the Earth, the members of the 1913 meteor procession apparently followed tracks similar to the gradual reentry of satellites in low Earth orbit. (Map courtesy Sky & Telescope)

Writing about the procession in *Nature* in 1916, William F. Denning observed that "Such an extended trajectory is without parallel in this branch of astronomy. Further reports from navigators in the South Atlantic Ocean might show that the observed flight was even greater." Later in 1916 Denning observed in the *Journal of the Royal*

Astronomical Society of Canada that, according to the most distant ship sighting known to him, the meteors "were still going strongly ... and may have pursued their luminous career far southwards over the South Atlantic Ocean, but navigators alone, during morning watches, can give us further information on the subject."

Olson and Hutcheon responded to the call for observations nearly a century later. Sifting through a vast array of archival material, the team discovered seven ship reports, all previously unknown, extending the established track of the procession by an additional thousand miles.

"We had the most wonderful help from U.K. and German archives. By the time they were finished, the German archivists had found six reports and the U.K. archivists had located one more," Olson said. "We have seven new accounts from ships' meteorological log books that extend the track farther than ever before. This is the most complete map for this phenomenon that's ever been compiled.

"The track now goes more than 7,000 miles—that's more than a quarter of the way around the world," he said. "That's an almost unbelievable meteor event!"

The search was complicated by several factors. One was that by the time the [meteors](#) crossed all the time zones from Western Canada to reach the ships in the South Atlantic, it was after midnight and therefore the relevant local date was Feb. 10. Additionally, the [Earth](#) continued to rotate beneath the meteor procession, effectively moving the track farther west than expected if it were a simple great circle arc. But after an extended search, the seven ships in the South Atlantic off the Brazilian coast turned up to provide valuable data reporting the event.

"This is the most complete map ever drawn of the ground track of the procession. The known ground track is now more than 7,000 miles long,"

Olson said. "The seven ship accounts are all newly-discovered for this article. The archivists helped us to find new information about one of the greatest meteor events."

Unfortunately, the ultimate fate of the spectacular meteor procession will likely never be known.

"They disappeared into the really obscure South Atlantic, outside of the well-traveled shipping lanes," Olson said. "We would like to locate more reports, but we've had no luck so far finding accounts from Brazil, islands in the South Atlantic, South Africa and Australia. But the procession was still going strong when seen by the last ship."

Provided by Texas State University

Citation: Celestial sleuths track historic meteor procession to South Atlantic (2013, January 24) retrieved 25 April 2024 from

<https://phys.org/news/2013-01-celestial-sleuths-track-historic-meteor.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.