

**Six interesting articles on the "Great Fireball Procession", witnessed
one hundred years ago today, on 9 February 2013**

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Mebane,AD

**A preliminary report on U.S. observations of the great fireball procession of 1913
February 9.**

Meteoritics 1 no.3, 360-361 (1955).

The Chant Trace and the Great Canadian Fireball Procession of 9 February 1913 - meteors - based on a new compilation of observations made in the USA it is suggested that the individual fireballs comprising the Trace had path-lengths "generally of from 500 to 1000 miles or more" - observational astronomy - Mebane made enquiries and found 43 new observations of light and/or sound made that night.

Mebane,AD

**Observations of the great fireball procession of 1913 February 9, made in the
United States.**

Meteoritics 1 no.4, 405-421 (1956).

Alexander Mebane's detailed description of the Chant Trace and the Great Canadian Fireball Procession of Sunday, 09 February 1913 - Canada and USA - detailed map - observational astronomy - a sequence of fireballs was seen crossing the sky, from northwest to southeast, cutting across southern Ontario - some subdivided into smaller meteors, and others disappeared to the southeast - "the spectacular display caused a sensation in the Toronto region, and Professor C.A. Chant ... immediately undertook an investigation" - he concluded that the meteors had been travelling horizontally at an altitude not exceeding 30 miles (50 km), as "in many places loud rumblings were heard" - audible phenomena - the geocentric velocity of the objects was estimated at about 6 miles per second - the path length eventually turned out to be remarkably long, from near Regina, Saskatchewan to the Atlantic ocean south of the equator, near Fernando de Noronha Island (off the coast of Brazil, S.America) - subsequent investigators could not reconcile the observations with Chant's best estimated altitude of 26 miles - history of science - Mebane made enquiries across 7 states to add to mostly-Canadian data assembled by Chant, by entreating hundreds of local newspapers to search their files - Mebane's detailed map extends from the Ontario-Minnesota border across Lake Superior, passing south of Marquette, Michigan, to Petoskey, Georgian Bay, Niagara Falls and Buffalo, then across New York state, passing just south of New York city to the

Atlantic - Mebane's enquiries produced positive results, with tales of fireballs from places along the Chant Trace, such as Bemidji, Hibbing, Houghton, Escanaba, Petoskey, Boyne City and Alpena (where between 24 and 50 fire-red balls were noted, travelling slowly, in a procession observed "for probably three minutes") - the Bay City-Saginaw region and Flint were also witness to the event, as it continued into southwest Ontario - quantitative data from observers at Houghton and East Lansing - rumbling sounds were noted over Hamilton and upstate New York - Nunda - Angelica - Dansville.

O'Keefe,JA

Tektites and the Cyrillid shower.

Sky and Telescope 21 no.1, 4-8 (January 1961).

Planetary science - a discussion of the singular event of 09 February 1913, known as the "Chant trace" or the "Canadian fireball procession" - new look at the phenomenon by O'Keefe, then with NASA, based on experience with artificial satellite re-entry since 1957 - C.A. Chant's description of the event, which he found followed a great circle route from Regina (Saskatchewan, Canada) past Toronto (Ontario) to Bermuda - later compilations of observations extended this arc to the South Atlantic off Cape Sao Roque (Brazil, S.America) - history of science - Mebane's compilations of newspaper reports in the USA - sonic phenomena - meteor-like bodies were observed for a period estimated by Chant as perhaps 3.3 minutes - O'Keefe refers to the bodies as Cyrillids (after St. Cyril's Day, 9th February), and infers a near-circular orbit around the Earth, the only explanation for the essentially horizontal "procession" across the sky - individual bodies were visible for roughly 1 minute - normal meteors are generally seen only at altitudes of 30-100 km - a normal meteor swarm might be only 100 miles wide and 2,000-3,000 miles long, hard to reconcile with the observations - O'Keefe suggests that these Cyrillids are satellites of the Earth - illustrated with informative paintings and sketches by observers in southern Ontario (Toronto, Thamesville, Parry Sound, "Fenlon Falls" [Fenelon Falls] and Centreton) and in Bermuda - newspapers reports in the USA were scoured without success for evidence of a second passage, but none was found - most probably the Cyrillids resulted from the breakup of a single body orbiting the Earth, as its orbit gently decayed and it spiralled down towards the planet - the "procession" may have been liquid droplets melted off the surface of the parent body, and this may be relevant to the origin of tektites - photos of tektites from the Philippines, Texas (USA), Australia and Billiton Island in Indonesia (a billitonite) - tektite features such as silica filaments and a preponderance of Fe^{II} over Fe^{III} are consistent with heating for 5-15 minutes, and thus at least some tektites could have formed from Cyrillid encounters.

LeMaire,TR

Stones from the Stars: The Unsolved Mysteries of Meteorites.

Prentice-Hall, Inc., 185pp. (1980).

Popular essays on meteorites, impact structures and planetary science, in 12 chapters, with 70 references and index - fireballs and meteorite fall phenomena - 1) fall of Lost

City, Oklahoma, USA ... - 2) the "Canadian fireball procession of 1913" - lengthy appearance of a trail of fireballs or similar objects, extending over a period of hours on the night of 9-10 February 1913, along a path from Regina, Saskatchewan, southeastwards via Minnesota, Michigan, southern Ontario (passing south of Toronto), New York and New Jersey into the Atlantic ocean - compilation of Prof. C.A. Chant of Toronto - history of science - later work of Mebane (1956) on the "Chant Trace"...

Lewis,JS

Rain of Iron and Ice - the very real threat of Comet and Asteroid Bombardment.
Helix Books, Addison-Wesley Publishing Company, 236pp. (1996).

Planetary science - impact events in the solar system - comets and meteorites - asteroids - the KT boundary - extinction events - the text was reviewed by Guy Consolmagno - history of science - ancient observations of meteorite falls - Ensisheim - Barringer and the meteorite crater in Arizona, USA - the Leonid meteor shower - perspective on the destructive force of man-made explosions, such as the 1917 explosion of a munitions ship off Dartmouth (Nova Scotia, Canada) and nuclear weapons - ... space missions and craters on the planets - Mariner missions to Venus and Mercury - NEO (near-Earth objects) - observational astronomy of the asteroids - Spacewatch - famous grazing-incidence events in the atmosphere such as that of 9 February 1913 over Canada (the so-called "Chant trace") and the 10 August 1972 event over Utah ... 1994 collision of comet Shoemaker-Levy 9 with Jupiter ...

Falk,D

Two artists, one poet and the amazing Canadian Fireball Procession of 1913.
Toronto Star, IN2 (06 June 2010).

Popular, detailed description of the Canadian Fireball Procession of 1913 (the "Chant trace") - observational astronomy - meteors - fireball events - the article links a number of events from 1860 onwards, starting with a painting of fireballs over the city of Toronto, Ontario on 09 February 1913, by artist Gustav Hahn (1866-1962) - the subject was one of just 4 known meteor processions, the first in 1783, the latest in 1913 - the artist's father, Otto Hahn, owned a valuable meteorite collection - an earlier painting by Frederic Church, "The Meteor of 1860", is linked to a poem by Walt Whitman entitled "Fear of Meteors (1859-1860)" - the event in question was seen by many on the evening of 20 July 1860 (see also Donald Falk's article in the July 2010 issue of Sky & Telescope).