

A COMPACT CATALOGUE OF CANADIAN METEORITES

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The 4th edition of the Natural History Museum catalogue of meteorites (Graham *et al.*, 1985), lists only 46 authenticated meteorites for Canada, the world's second-largest country, compared with, e.g., Chile (35 from <8% of Canada's surface area) and India (33% of the area, yielding 124 meteorites from 18 states, 38 from the state of Uttar Pradesh alone). 15 years later, the 5th edition (Grady, 2000) lists 50 Canadian meteorites, not counting Leeds, which was downgraded to synonym status. The Canadian meteorite-recovery rate is modest: only 15 have been recovered in the province of Ontario, which has an area 154% the size of Texas, big enough to hold five states the size of Kansas (>110 known meteorites!). Obviously, low population density and inclement winter weather may conspire with terrain and land-use factors to hinder recovery of falls and finds alike, relative to more southerly "hunting grounds" such as Texas and New Mexico. Traill (1980) noted that the National Museum in Ottawa had samples of a majority of known Canadian meteorites. There are few discrepancies in nomenclature between his catalogue and that of Graham *et al.* and White (1984); Traill omitted Wynyard, which was unknown to him at the time, and included the now-discredited Akpohon. The ongoing research of Traill's successor, Richard Herd, indicates that 39 of 46 Canadian meteorites recognized up to 1990 are represented in the National Collection (exceptions: De Cewsville; Edmonton (Canada); Ferintosh; Great Bear Lake; Homewood; Kinsella; Vilna). The past 19 years have been remarkably productive, with at least 26 new meteorites (falls, finds and "belated recognitions") and one "loss" (Leeds --- a synonym for Toluca; Kissin *et al.*, 1999). The following list contains 71 actual (or possible) and 7 discredited names from nine jurisdictions (Nunavut Territory aside, only Nova Scotia, P.E.I. and Newfoundland lack any contenders for "provincial meteorite"!). Note that the Yukon irons, formerly known as Klondike (Gay Gulch and Skookum Gulch) are now called Gay Gulch and Skookum, the earlier names persisting as synonyms in the literature.

The total as quoted herein is **71 "Canadian" meteorites**; 16 falls and 55 finds. Information on new material tends to filter slowly into the public domain: expect this number to grow! According to data available to the compiler, unique status as a Canadian meteorite is confirmed for all, except perhaps some of the latest reported finds. Note that IAB and IIICD irons are currently termed "IAB complex". Basic data are needed for at least 9 meteorites, new & old;

1. Ni content and confirmation of associated data: **Gilbert Plains, Green Lake**
2. Petrographic grade: **Holman Island**,
3. Olivine composition: **Kinley**,
4. Olivine, petrographic grade, class: **Saskatchewan Landing, Hodgeville, Lake Eliza, Montney, Churchill**.

The source of this compilation, CANAMET, is a "metadatabase" of Canadian meteorite data, maintained by the compiler. It may prove useful in two contexts:

1. Planning research projects. The class, capsule history and known mass of each meteorite is shown. A glimpse of research history is seen in the number of references to each find or fall in the compiler's MINLIB, an annotated bibliographic database. MINLIB comprises >78,000 records; >6,000 records are relevant to meteorites and nucleosynthesis, and >9,000 to the larger field of meteorites, tektites, impact events and planetary science. MINLIB citations for 109 meteorite names are totalled in the table. Amongst Canadian meteorites, the unique Tagish Lake chondrite rose to third place in this unofficial citation index within 2 years of its fall!
2. Provenance and authenticity. See class, Ni (wt.%) and/or the fayalite content in olivine. Much information may be retrieved from the smallest meteorites such as Vilna: see Smith *et al.*, 1973! One wonders whether more Revelstoke exists. These two are the only Canadian meteorites much below one ounce (28.35 g) in weight. The largest, Bruderheim, totals 303 kg. The total from Buzzard Coulee (November 2008 fall) is growing fast, and appears already to exceed 200 kg and 1,000 fragments. An idle thought: might Red Deer Hill and Blaine Lake be paired? -- a recent examination suggests not. For that matter, is "Wood Lake" perhaps a piece of St-Robert?

Acknowledgements: the accuracy of this catalogue was much improved by advice from Richard Herd, Steve Kissin & others. The original MIAC web-page format was engineered by Mike Higgins. Further updates and errata welcome!

CANADIAN METEORITES - MAIN LISTING (71): 56 “official”. *Italics*: provisional name & status (**15** still need publication in *Meteoritical Bulletin*). CANAMET output, with meteorite citations updated October 29, 2006 or beyond

<i>Meteorite</i>	<i>Type</i>	<i>Class</i>	<i>Ni%_{METAL}</i>	<i>Fa%_{OLIV}</i>	<i>History</i>	<i>Date</i>	<i>Mass (kg)</i>	<i>Refs_{MINLIB}</i>	<i>Earliest</i>
ALBERTA (17)									
Abee	Chondrite	EH5	-	-	Fall	1952	107	120	1960
Belly River	Chondrite	H6	-	20	Find	1943	7.9	10	1953
<i>Belly River Buttes</i>	Chondrite	L6	-	25	Find	1992	1.5	3	2004
Bruderheim	Chondrite	L6	-	24	Fall	1960	303	83	1961
Edmonton (Canada)	Iron	IIA	5.37	-	Find	1939	17.34	5	1969
Ferintosh	Chondrite	L6	-	26	Find	1965	2.201	4	1984
Innisfree	Chondrite	LL5	-	27	Fall	1977	4.58	26	1978
Iron Creek	Iron	IIIA	7.72	-	Find	1866	145.85	11	1886
Kinsella	Iron	IIIB	8.78	-	Find	1946	3.72	4	1978
<i>Lake Eliza</i>	Chondrite	H(?)	-	-	Find	2005	0.350	-	----
Mayerthorpe	Iron	IA	7.19	-	Find	1964	12.61	6	1971
Millarville	Iron	IVA-ANOM	9.78	-	Find	1977	15.636	6	1979
Peace River	Chondrite	L6	-	23	Fall	1963	45.76	35	1967
Skiff	Chondrite	H4	-	18	Find	1966	3.54	6	1980
Vilna	Chondrite	L5	-	25	Fall	1967	0.00014	5	1973
Vulcan	Chondrite	H6	-	20	Find	1962	19	11	1967
Whitecourt	Iron	IIIB	8.11	-	Find	2007	5.4	5	2007
BRITISH COLUMBIA (5)									
Beaver Creek	Chondrite	H4	-	19	Fall	1893	14	19	1963
<i>Montney</i>	Chondrite	H6(?)	-	-	Fall	2005	0.15	-	----
Revelstoke	Chondrite	CI1	-	-	Fall	1965	0.001	15	1967
Tagish Lake	Chondrite	CI2	-	0-29	Fall	2000	.11.0	105	2000
<i>Green Lake (Whistler)</i>	Iron	(?)	-	-	Find	1991	(?)	-	----
MANITOBA (9)									
<i>Bernic Lake</i>	Iron	IAB	6.53	-	Find	2002	9.8	4	2004
<i>Churchill</i>	Chondrite	(?)	-	-	Find	2007	0.850	1	2007
<i>Elm Creek</i>	Chondrite	H4	-	18	Find	1997	8.2	7	2002
<i>Gilbert Plains</i>	Iron	IA	-	-	Find	2001	0.113	1	2001
Giroux	Stony iron	Pallasite	10.3	11	Find	1954	4.275	10	1967
Homewood	Chondrite	L6	-	25	Find	1970	0.325	5	1976
<i>Lone Island Lake</i>	Iron	IAB	7.62	-	Find	2005	>5.0	2	2005

<i>Meteorite</i>	<i>Type</i>	<i>Class</i>	<i>Ni%_{METAL}</i>	<i>Fa%_{OLIV}</i>	<i>History</i>	<i>Date</i>	<i>Mass (kg)</i>	<i>Refs_{MINLIB}</i>	<i>Earliest</i>
<i>Pinawa</i>	Iron	IAB	7.57	-	Find	1999	2.5	3	2005
Riverton	Chondrite	H5	-	20	Find	1960	0.103	2	1976
N.W.T. (2)									
Great Bear Lake	Chondrite	H6	-	19	Find	1936	0.04	2	1963
Holman Island	Chondrite	LL(?)	-	29	Find	1951	0.552	8	1963
NEW BRUNSWICK (1)									
Benton	Chondrite	LL6	-	31	Fall	1949	2.84	6	1964
ONTARIO (15)									
Blithfield	Chondrite	E6	-	-	Find	1910	1.83	18	1922
De Cewsville	Chondrite	H6	-	18	Fall	1887	0.340	3	1900
Dresden (Ontario)	Chondrite	H6	-	20	Fall	1939	47.7	21	1939
Hagersville	Iron	IAB	6.89	-	Find	1999	30.0	2	2001
Kitchener	Chondrite	L6	-	26	Fall	1998	0.202	12	1998
Madoc	Iron	IIIA	7.52	-	Find	1854	167.5	24	1855
Manitouwabing	Iron	IIIA	7.34	-	Find	1962	38.6	17	1964
Midland	Iron	IA	8.37	-	Find	1960	0.034	4	1971
Osseo	Iron	IA	6.51	-	Find	1931	46.3	11	1938
Shelburne	Chondrite	L5	-	24	Fall	1904	18.6	12	1904
Southampton	Stony iron	Pallasite	9.47	12.5	Find	2001	3.58	3	2002
Thurlow	Iron	IIIB	9.92	-	Find	1888	5.5	5	1900
Toronto	Iron	IAB	7.04	-	Find	1997	2.715	4	1997
Welland	Iron	IIIA	8.77	-	Find	1888	8.16	19	1891
<i>Wood Lake</i>	Chondrite	H4	-	19	Find	2003	0.35	1	2004
QUEBEC (5)									
Chambord	Iron	IIIA	7.53	-	Find	1904	6.6	5	1963
<i>Chibougamau</i>	Iron	IAB	6.54	-	Find	1972	1.452	2	2000
Lac Dodon	Iron	IAB	8.64	-	Find	1993	0.800	4	1995
Penouille	Iron	IAB	9.40	-	Find	1984	0.072	3	1995
St-Robert	Chondrite	H5	-	19	Fall	1994	25.4	23	1994
For historical reference:									
Leeds [= Toluca, see below]	Iron	IA	8.08	-	Find	1931	1.445	10	1939

<i>Meteorite</i>	<i>Type</i>	<i>Class</i>	<i>Ni%_{METAL}</i>	<i>Fa%_{OLIV}</i>	<i>History</i>	<i>Date</i>	<i>Mass (kg)</i>	<i>Refs_{MINLIB}</i>	<i>Earliest</i>
SASKATCHEWAN (15)									
Annaheim	Iron	IA-ANOM	7.74	-	Find	1916	11.84	13	1921
Blaine Lake	Chondrite	L6	-	26	Find	1974	1.896	5	1978
Bruno	Iron	IIA	5.79	-	Find	1931	13	6	1936
Burstall	Iron	IAB	6.57	-	Find	1992	0.359	4	1998
Buzzard Coulee	Chondrite	H4	-	18	Fall	2008	≥200	5	2008
Catherwood	Chondrite	L6	-	25	Find	1965	3.92	8	1973
<i>Delaine Lake</i>	Chondrite	H5	-	19	Find	2000	3.0	5	2000
Fillmore	Iron	IA	7.18	-	Find	1916	0.200	3	1971
Garden Head	Iron	IRANOM	16.96	-	Find	1944	1.296	5	1971
<i>Hodgeville</i>	Chondrite	H3-H4(?)	-	-	Find	1996	7.000	1	2002
Kinley	Chondrite	L6	-	-	Find	1965	2.44	4	1971
Red Deer Hill	Chondrite	L6	-	26	Find	1975	25.0	5	1978
<i>Saskatchewan Landing</i>	Stone;(?)	Stone	-	-	Find	1980	8.5	3	2000
Springwater	Stony iron	Pallasite	12.6	18	Find	1931	67.6	52	1932
Wynyard	Chondrite	H5	-	18	Find	1968	3.479	4	1980
YUKON (2)									
Gay Gulch	Iron	IRANOM	15.06	-	Find	1901	0.483	7	1915
Skookum	Iron	IVB	17.13	-	Find	1905	15.88	18	1915

OTHERS (7 – countless “meteorwrongs” have been reported)

<i>Name</i>	<i>Status</i>	<i>Area</i>	<i>Likely explanation</i>	<i>Refs_{MINLIB}</i>	<i>Earliest</i>
Akpohon	Discredited	N.W.T.	Dubious - synonym of Cape York	1	1980
Eastman	Discredited	Quebec	Dubious - no material	1	1968
Leeds	Discredited	Quebec	Dubious - synonym of Toluca	10	1939
Malaspina	Discredited	B.C.	Dubious - pseudometeorite	1	2001
Otasawian	Discredited	Alberta	Dubious - synonym of Canyon Diablo?	2	1969
Prince George	Discredited	B.C.	Dubious - fireball event, no material	1	1971
Takysie Lake	Discredited	B.C.	Dubious - pseudometeorite	2	1967

NOTES

Mass and some other information are provisional in the case of some of the most-recent falls and finds. Physical specimens have been documented for Akpohon, Leeds and Otasawian (iron meteorites) and Takysie Lake (volcanic rock). No material was recovered in the case of Eastman and Prince George, which are included here only for consistency with earlier meteorite catalogues. Hundreds of "meteorwrongs" have been diagnosed over the years by Canadian museum and university staff: all kinds of slag and metallurgical products ("Malaspina", a steel, may be remembered by a few!), mafic-ultramafic rocks, hematite nodules, pyrite spheroids, geodes and other natural terrestrial rocks considered remarkable by their finders, for reasons of circumstance, density, texture, shape and other features. The finders should not be discouraged; in every few hundred meteorwrongs there is often a meteorite. The latter are sometimes part of an abundant shower or major find (Holbrook, Canyon Diablo), and sometimes a true unknown, new to science: the January 2000 fall of Tagish Lake appears to be in this invaluable category. For further details on all but the latest finds and falls, see the recent 5th edition of the N.H.M. meteorite catalogue (Grady, 2000). See also the web sites of the Meteoritical Society and MIAC, and of the Prairie Meteorite Search, a regional recovery project led by MIAC members, which has been responsible for bringing to light a number of newly-recognized meteorites.

The most obvious deficiency in this compilation is the increasing backlog of meteorites which have not been submitted or, at the least, not yet approved by the Meteoritical Bulletin: nine stones and six irons. Out of the 71 meteorites attributed to Canada, 29 [41%] are irons. BUT the actual falls are all stones: 0/30 irons, 0/3 stony-irons and 16/38 stony meteorites (chondrites). The distribution of falls and finds amongst provinces is also intriguing, and not unrelated to the distribution of arable land.

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MIAC

<http://miac.uqac.ca>

METEORITICAL SOCIETY and Meteoritical Bulletin

<http://www.meteoriticalsociety.org>

PRAIRIE METEORITE SEARCH

<http://www.geo.ucalgary.ca/PMSearch/>

<i>Meteorite</i>	<i>Type</i>	<i>Class</i>	<i>Ni%_{METAL}</i>	<i>Fa%_{OLIV}</i>	<i>History</i>	<i>Date</i>	<i>Mass (kg)</i>	<i>Refs_{MINLIB}</i>	<i>Earliest</i>
WORLDWIDE, for comparison (38)									
ALH84001	Achondrite	SNC	-	-	Find	1984	1.900	153	1991
Allende	Chondrite	CV3	-	-	Fall	1969	2000	496	1970
Bishunpur	Chondrite	LL3.1	-	-	Fall	1895	1.039	86	1932
Bjurbole	Chondrite	L4	-	26	Fall	1899	330	56	1960
Brenham	Stony iron	Pallasite	11.1	12.5	Find	1890	1490	55	1890
Campo del Cielo	Iron	IA	6.62	-	Find	1576	15000	51	1932
Canyon Diablo	Iron	IA	6.98	-	Find	1891	30000	204	1891
Chainpur	Chondrite	LL3.4	-	8-45	Fall	1907	8.66	83	1932
Chassigny	Achondrite	SNC;chassignite	-	-	Fall	1815	4.0	83	1940
Coahuila	Iron	IIA	5.49	-	Find	1837	2060	58	1855
Cold Bokkeveld	Chondrite	CM2	-	0-91	Fall	1838	5.14	55	1966
EET79001	Achondrite	SNC;shergottite	-	-	Find	1979	7.942	73	1983
Ergheo	Chondrite	L5	-	25	Fall	1889	20.0	21	1962
Gibeon	Iron	IVA	7.68	-	Find	1836	18600	83	1961
Hoba	Iron	IVB	16.56	-	Find	1920	60000	46	1926
Holbrook	Chondrite	L6	-	25	Fall	1912	219	43	1912
Imilac	Stony iron	Pallasite	9.9	12	Find	1822	366	31	1906
Indarch	Chondrite	EH4	-	-	Fall	1891	27	73	1962
Jilin	Chondrite	H5	-	18	Fall	1976	4000	57	1976
Juvinas	Achondrite	Eucrite	-	-	Fall	1821	91	58	1940
Knyahinya	Chondrite	L5	-	25	Fall	1866	500	43	1880
Kodaikanal	Iron	III-ANOM	8.22	-	Find	1898	16	47	1906
Mezo-Madaras	Chondrite	L3	-	26	Fall	1852	22.7	45	1901
Murchison	Chondrite	CM2	-	-	Fall	1969	100	381	1972
Nakhla	Achondrite	SNC;nakhlite	-	-	Fall	1911	40	120	1940
Negrillos	Iron	IIA	5.41	-	Find	1936	28.5	36	1941
Norton County	Achondrite	Aubrite	-	-	Fall	1948	1080	43	1962
Orgueil	Chondrite	CI	-	-	Fall	1864	10.5	170	1939
Paneth's Iron	Iron	III-E	8.98	-	Find	1873	150	8	1976
Parnallee	Chondrite	LL3.6	-	5-29	Fall	1857	68.9	53	1861
Portales Valley	Chondrite	H6	-	19	Fall	1998	71.384	35	1998
Semarkona	Chondrite	LL3.0	-	20	Fall	1940	0.691	147	1963
Shergotty	Achondrite	SNC;shergottite	-	-	Fall	1865	5.000	89	1932
Sikhote Alin	Iron	IIB	5.87	-	Fall	1947	23000	49	1961
Tieschitz	Chondrite	H3.6	-	10-55	Fall	1878	28	84	1939
Toluca	Iron	IA	8.07	-	Find	1776	2100	101	1899
Willamette	Iron	IIIAB	7.62	-	Find	1902	15000	17	1904
Zagami	Achondrite	SNC	-	-	Fall	1962	18.16	94	1983

DEFINITE or POSSIBLE CANADIAN IMPACT SITES
05 January 2005 / 08 December 2007 (partial revision)

<i>Site</i>	<i>Refs_{MINLIB}</i>	<i>Earliest</i>	<i>Total refs. on area</i>
Boreal (Shebandowan area, NW Ontario)	1	2006	
Brent	27	1960	
Carswell Lake	14	1960	40, 1960-
Charlevoix (La Malbaie, Baie St. Paul)	16	1968	
Clearwater Lakes	31	1960	
Deep Bay (on Reindeer Lake)	14	1960	
Eagle Butte	2	1994	
Elbow	1	1998	
Gow Lake	1	1991	
Gulf of St. Lawrence	3	1960	
Haughton	45	1981	
Holleford	21	1960	
Ile Rouleau	1	1976	
Lac Couture	5	1960	
Lac de la Presqu'île	2	1990	
Lake St. Martin	9	1979	
Manicouagan	42	1960	98, 1960-
Maple Creek	3	1992	
Mecatina	3	1960	
Menihek Lake	3	1960	
Mistastin	9	1969	
Montagnais	3	1990	
Nicholson Lake	3	1968	
Pilot Lake	1	1968	
Pingualuit (New Quebec, Ungava, Chubb) *	21	1960	
Sept-Iles (Banc Ouellet)	0	----	
Skeleton Lake	3	1970	
Skootamatta Lake	1	1978	23, 1940-
Slate Islands	32	1978	
Steen River	5	1977	
Sudbury	183	1969	1282, 1889-
Wanapitei	16	1971	82, 1917-
West Hawk Lake	9	1960	

Notes

33 definite / suggested impact sites. Others (e.g., Des Plaines, La Moine) are not mentioned in current MINLIB records. Thanks to Burkhard Dressler and Michael Higgins for spotting omissions!

* See also a beautifully illustrated guide to the lake, the new park and the local ecology:

http://www.fapaq.gouv.qc.ca/en/consultation/pingualuit/synthese_ping_A.pdf
ou (en français)

http://www.fapaq.gouv.qc.ca/fr/consultation/pingualuit/synthese_ping_F.pdf