# Department of Terrestrial Magnetism Cooperative Expedition Records, 1921-1927, 1935-1937, n.d.

**Carnegie Institution of Washington**
**Department of Terrestrial Magnetism Archives**
**Washington, DC**

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# Department of Terrestrial Magnetism Cooperative Expedition Records, 1921-1927, 1935-1937, n.d.

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**DTM-2009-02**

## Introduction

*Abstract:* This collection documents the participation of Department of Terrestrial Magnetism scientists and administrators in geophysical, atmospheric, and meteorological data collection activities during expeditions, often to Arctic or Antarctic regions, undertaken in cooperation with other organizations and individuals, in the 20th century.

*Extent:* 6 linear feet (2 2-foot banker's boxes, 1 records center carton, 1 flat storage box, and 1 half-size document case).

*Acquisition:* The records have been in the possession of the Department of Terrestrial Magnetism (DTM) since their creation.

*Access Restrictions:* There are no access restrictions to this collection.



*Preferred Citation:* Department of Terrestrial Magnetism Cooperative Expedition Records, 1921-1927, 1935-1937, n.d., Department of Terrestrial Magnetism, Carnegie Institution of Washington, Washington, D.C.

*Processing:* Joseph Neumann processed this collection in 2009.

## Historical Note

From its establishment in 1904, the Department of Terrestrial Magnetism (DTM) has participated in scientific expeditions to remote areas in order to collect geomagnetic, atmospheric, and other geophysical data. Some of these expeditions were planned and organized solely by DTM. These efforts are documented in *Land Magnetic Survey Records, 1905-1945* and *Ocean Magnetic Survey Records, 1905-1946*.[1] On other occasions, DTM collaborated with other entities (such as the National Geographic Society or the United States Coast and Geodetic Survey). This collection documents these collaborations. The extent of DTM's participation in these cooperative endeavors ranged from the assignment of staff members to the expedition, to the design and supply of scientific instruments, to data collection training for expedition partners.

A brief description of each expedition, in chronological order, follows.

*MacMillan Baffin Land Expedition, 1921-1922*

Donald B. MacMillan (1874-1970) was a leading Arctic explorer who served as an assistant on Admiral Robert Peary's 1909 North Pole Expedition. In later years MacMillan mounted numerous expeditions to the Arctic, many aboard his schooner, the *Bowdoin*, during which he collected data in fields such as botany, ornithology, meteorology, and anthropology[2].

In 1921, the MacMillan Arctic Association sent an expedition, led by MacMillan himself, to Baffin Island (then called Baffin Land) in the Canadian Arctic. The *Bowdoin* sailed from Maine in July of 1921 and made stops to take observations at Sydney, Nova Scotia; Bonne Bay, Newfoundland; Battle Harbor, Labrador; Ashe Inlet on Baffin Island; and at two locations on the Baffin side of the Foxe Channel.[3] [4] In November of 1921, MacMillan and the expedition team established winter quarters at an inlet on the southwestern coast of Baffin Island, which was then named Bowdoin Harbor, after MacMillan's ship (and alma mater). The expedition remained in Bowdoin Harbor until the break up of sea ice in May 1922 allowed the ship to return to the south.

DTM's participation in this expedition took two forms. Richard H. Goddard, a DTM staff member, accompanied MacMillan to Baffin Island and operated a magnetic observatory (designed by DTM) at Bowdoin Harbor for more than seven months during the winter of 1921-1922. In addition, an employee of the MacMillan Arctic Association, G. Dawson Howell, was trained by the Department to collect atmospheric electrical data.[5] Goddard and Howell obtained data on "magnetic declination, horizontal intensity, and vertical intensity and of the electric potential gradient of the atmosphere." Meteorological and tidal observations were also made.[6] Howell also undertook several sledge trips during the winter of 1921-1922 to make observations at other points on Baffin Island.[7]

*MacMillan North Greenland Expedition, 1923-1924*

Soon after his return from Baffin Island, Donald MacMillan began planning his next expedition to the Arctic, intending this time to spend the winter at Refuge Harbor on Greenland's northwest coast. DTM again assigned Richard Goddard to accompany MacMillan and make magnetic, atmospheric electric, and meteorological observations. The *Bowdoin* departed Maine in June of 1923, and made stops to take on supplies and collect data at Sydney, Nova Scotia; Red Bay, Battle Harbor, Gready, and Hopedale, Labrador; and Godthaab and Etah, Greenland. Winter quarters were established at Refuge Harbor at the end of August, and Goddard set to work building the magnetic observatory.[8] Magnetograph and potential-gradient electrograph registrations were made for eight months, between October 1923 and June 1924. The observatory's design was an "improved" and "superior" version of the one built at Bowdoin Harbor in 1921.[9] The *Bowdoin* left Refuge Harbor in August, stopped to make observations at Keate, Akpani, Godhavn, Holstensborg, and Godthaab in Greenland, and returned to her home port of Wiscasset, Maine in September of 1924.[10]

**Scope and Content**

*The Department of Terrestrial Magnetism Cooperative Expedition Records* contains material and data created, collected, and assembled before, during, and after scientific expeditions in which DTM participated during the 20th century. The collection includes correspondence, memoranda,

and other documents (such as equipment lists or manifests) related to the planning, administration, and execution of expeditions or their component elements. The collection also contains magnetic, atmospheric electric, meteorological and other data obtained by DTM staff members or on DTM designed or supplied equipment, during the course of these expeditions. These data are preserved in a variety of formats, including observer's cahiers (log books), binders, "traces" (continuous recordings of data, printed on photographic bromide paper) from magnetographs and other instruments, as well as narrative descriptions of natural phenomena.

The volume of material for each expedition varies from relatively extensive to quite limited. For some series, there may be administrative records but scanty data, while for others the reverse is the case.

## Arrangement

This collection is arranged into 2 series. Each series documents a separate expedition.

Series 1: MacMillan Baffin Land Expedition (1921-1922), 1921-1923, 1935, n.d.
- Subseries A: Administration and Planning, 1921-1923, n.d.
- Subseries B: Observations and Results, 1921-1922, 1935
  - Sub-subseries i: Atmospheric Electricity Records and Data, 1921-1922
  - Sub-subseries ii: Chronometric Records and Data, 1921-1922
  - Sub-subseries iii: Magnetic Records and Data, 1921-1922, 1935

Series 2: MacMillan North Greenland Expedition (1923-1924), 1923-1927, 1937, n.d.
- Subseries A: Administration and Planning, 1923-1927, n.d.
- Subseries B: Observations and Results, 1923-1924, 1936-1937
  - Sub-subseries i: Atmospheric Electricity Records and Data, 1923-1924
  - Sub-subseries ii: Chronometric, Compass, and Meteorological Records and Data, 1923-1924
  - Sub-subseries iii: Magnetic Records and Data, 1923-1924, 1936-1937

## Series Descriptions

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**Series 1: MacMillan Baffin Land Expedition (1921-1922), 1921-1923, 1935, n.d.**
This series contains records relating to DTM's involvement in the planning, data collection, and analysis phases of the MacMillan Baffin Land Expedition. It is divided into 2 subseries.

Subseries A, "Administration and Planning", documents DTM's oversight of its participation in the expedition. It includes correspondence among Donald MacMillan, DTM Director Louis A. Bauer, DTM Deputy Director John Fleming, Richard Goddard, G. Dawson Howell, and other persons, before, during, and after the expedition. It also includes detailed memoranda given to Goddard and Howell establishing procedures and methods for data collection; instrument and equipment packing lists; a summary memorandum written after the expedition's return; a photographic prints list; and newspaper clippings related to the expedition. Because the prints

were given standard DTM numbers, the prints list may be used as a tool to find images in the DTM Library and Archives' extensive photographic holdings.

Subseries B, "Observations and Results" contains the magnetic and atmospheric electric data obtained by Goddard and Howell during the expedition. It is divided into 3 sub-subseries, "Atmospheric Electricity Records and Data", "Chronometric Records and Data", and "Magnetic Records and Data". These data are recorded in cahiers (log books bound with cloth ribbon), binders, and on instrument traces (continuous recordings of data printed on photographic bromide paper). Sub-subseries iii, "Magnetic Records and Data", also includes an unpublished manuscript by DTM staff member W. F. Wallis, written in 1935, which summarizes the magnetic data recorded during the expedition.

**Series 2: MacMillan North Greenland Expedition (1923-1924), 1923-1927, 1936-1937, n.d.**
This series contains records relating to DTM's involvement in the planning, data collection, and analysis phases of the MacMillan North Greenland Expedition. It is divided into 2 subseries.

Subseries A, "Administration and Planning", documents DTM's oversight of its participation in the expedition. It includes correspondence among MacMillan, Bauer, Fleming, Goddard, and other persons. It also includes detailed memoranda given to Goddard establishing procedures and methods for data collection; instrument and equipment packing lists; a summary memorandum written by Goddard after his return; a photographic prints list; maps and charts produced or used during the expedition; and a newspaper clippings file. Because the prints were given standard DTM numbers, the prints list may be used as a tool to find images in the DTM Library and Archives' extensive photographic holdings.

Subseries B, "Observations and Results" contains the magnetic, meteorological, and atmospheric electric data obtained by Goddard during the expedition. It is divided into 3 sub-subseries: "Atmospheric Electricity Records and Data", "Chronometric, Compass, and Meteorological Records and Data", and "Magnetic Records and Data". These data are recorded in cahiers (log books bound with cloth ribbon), binders, and on instrument traces. Sub-subseries iii, "Magnetic Records and Data" also includes an unpublished manuscript by Wallis, written in 1937, which summarizes the magnetic data collected during the expedition.

**Folder Listing**

| Folder Title | Box | Folder |
|---|---|---|
| **Series 1: MacMillan Baffin Land Expedition (1921-1922), 1921-1923, 1935, n.d.** | | |
| **Subseries A: Administration and Planning, 1921-1923, n.d.** | | |
| Correspondence, 1921 | 1 | 1 |
| Correspondence, 1922-1923 | | 2 |
| Instruction Memoranda I-VII, 1921 | | 3 |
| Instruction Memoranda Enclosures A-J, 1921 | | 4 |

| Folder Title | Box | Folder |
|---|---|---|
| "Scientific Opportunities of the MacMillan Baffin Land Expedition" [summary of remarks by DTM Director L. A. Bauer at farewell dinner for MacMillan Expedition], 1921 | | 5 |
| Instrument and Equipment Packing Lists, 1921-1922 | | 6 |
| Summary Memorandum and Photographic Print List, 1922 | | 7 |
| "Bowdoin Harbor Views, Tabulations, and Diagrams" [unpublished manuscript], n.d. | 3 | 1 |
| Hudson's Bay Company Map of Canada [annotated to show locations on Baffin Island] | MC | DR 19 |
| Press Clippings, 1922 | MC | DR 19 |
| **Subseries B: Observation and Results, 1921-1922, 1935** | | |
| **Sub-subseries i: Atmospheric Electricity Records and Data, 1921-1922** | | |
| Observer's Cahier no. 7C: Potential Gradient Observations, 1921-1922 | 1 | 8 |
| Bowdoin Harbor Potential Gradient Records on Photographic Bromide Paper, November 1921-June 1922 | 3 | 2 |
| Bowdoin Harbor Potential Gradient Records on Photographic Bromide Paper, November 1921-June 1922 ("Records selected for scaling") | | 3 |
| **Sub-subseries ii: Chronometric Records and Data, 1921-1922** | | |
| Observer's Cahier no. 7D: Chronometers and Watches, 1921-1922 | 1 | 9 |
| Observer's Cahier: Timepiece Records from G. Dawson Howell's Sledge Trips, 1922 | | 10 |
| **Sub-subseries iii: Magnetic Records and Data, 1921-1922, 1935** | | |
| "A Type of Polar Magnetic Disturbance of Short Duration", 1921 | 3 | 4 |
| "Magnetic Results of the MacMillan Baffin Land Expedition, 1921-1922" [unpublished ms. by W.F. Wallis], 1935 | 1 | 11 |
| Observer's Cahier no. 7A: Bowdoin Harbor Absolute, 1921-1922 | 1 | 12 |
| Observer's Cahier no. 7D: Magnetograph no. 5, 1921-1922 | | 13 |
| Observer's Cahier no. 7E: Station B, 1921-1922; Observer's Cahier no. 7F: Station C, 1922; Observer's Cahier no. 7G: Magnetograph no. 16, 1921 | | 14 |
| Observer's Cahier: Notes and Reductions, 1921-1922 | | 15 |
| Traces: Bowdoin Harbor Magnetograms, October 1921 | 4 | 1 |
| Traces: Bowdoin Harbor Magnetograms, November 1921 | | 2 |
| Traces: Bowdoin Harbor Magnetograms, December 1921 | | 3 |
| Traces: Bowdoin Harbor Magnetograms, January 1922 | | 4 |
| Traces: Bowdoin Harbor Magnetograms, February 1922 | | 5 |
| Traces: Bowdoin Harbor Magnetograms, March 1922 | | 6 |

| Folder Title | Box | Folder |
|---|---|---|
| Traces: Bowdoin Harbor Magnetograms, April 1922 | | 7 |
| Traces: Bowdoin Harbor Magnetograms, May 1922 | | 8 |
| Traces: Bowdoin Harbor Magnetograms, June 1922 | | 9 |
| **Series 2: MacMillan North Greenland Expedition (1923-1924), 1923-1927, 1936-1937, n.d.** | | |
| **Subseries A: Administration and Planning, 1923-1927, n.d.** | | |
| Correspondence, 1923-1927 | 1 | 16 |
| Instructions and Enclosures, 1923-1927 | | 17 |
| Instruments and Equipment Packing List, 1924 | | 18 |
| Maps, Charts, and Plans, 1923-1924, n.d. | MC | DR 19 |
| Press Clippings, 1923-1924 | 1 | 19 |
| Richard Goddard's Final Report and Photographic Print List, 1924 | | 20 |
| **Subseries B: Observation and Results, 1923-1924, 1936-1937** | | |
| **Sub-subseries i: Atmospheric Electricity Records and Data, 1923-1924** | | |
| Observer's Cahier no. 7F: Quadrant Electrometer no. 19284, 1923-1924; Observer's Cahier no. 7G: Electrometer no. 20; Voltmeter no. 32702; Batteries A14688, A14689, and A14690, 1924 | 1 | 21 |
| Traces: Refuge Harbor Potential Gradient, October 1923 | 5 | 1 |
| Traces: Refuge Harbor Potential Gradient, November 1923 | | 2 |
| Traces: Refuge Harbor Potential Gradient, December 1923 | | 3 |
| Traces: Refuge Harbor Potential Gradient, January 1924 | | 4 |
| Traces: Refuge Harbor Potential Gradient, February 1924 | | 5 |
| Traces: Refuge Harbor Potential Gradient, March 1924 | | 6 |
| Traces: Refuge Harbor Potential Gradient, April 1924 | | 7 |
| Traces: Refuge Harbor Potential Gradient, May 1924 | | 8 |
| Traces: Refuge Harbor Potential Gradient, June 1924 | | 9 |
| **Sub-subseries ii: Chronometric, Compass, and Meteorological Records and Data, 1923-1924** | | |
| Observer's Cahier no. 7D: Chronometers nos. 254-264; Watches nos. 106, 109, 118, 804, 1923-1924; Observer's Cahier no. 7E: Kelvin and White Liquid Compass no. 01994; Watch no. 109, 1924; Observer's Cahier no. 7H: Meteorological Observations, 1923-1924 | 1 | 22 |
| **Sub-subseries iii: Magnetic Records and Data, 1923-1924, 1936-1937** | | |
| Magnetic Abstracts Log, 1923-1924 | 1 | 23 |
| "Magnetic Results of the MacMillan North Greenland Expedition, 1923-1924" [unpublished ms. by W.F. Wallis], 1936-1937 | | 24 |
| Observer's Cahier no. 7A: Dover Dip Circle nos. 241-242; Watches no. 106 and 118, 1923-1924; Observer's Cahier no. 7B: Theodolite no. 2; Watch no. 106, 1923-1924 | | 25 |
| Observer's Cahier no. 7C: Magnetograph no. 5, 1923-1924 | 2 | 1 |
| Observer's Cahier: Refuge Harbor Horizontal Intensity, 1923-1924 | | 2 |

| Folder Title | Box | Folder |
|---|---|---|
| Refuge Harbor Magnetic Observations Binder, 1923-1924 | 5 | 10 |
| Traces: Refuge Harbor Magnetograms, October 1923 | | 11 |
| Traces: Refuge Harbor Magnetograms, November 1923 | | 12 |
| Traces: Refuge Harbor Magnetograms, December 1923 | | 13 |
| Traces: Refuge Harbor Magnetograms, January 1924 | | 14 |
| Traces: Refuge Harbor Magnetograms, February 1924 | | 15 |
| Traces: Refuge Harbor Magnetograms, March 1924 | | 16 |
| Traces: Refuge Harbor Magnetograms, April 1924 | | 17 |
| Traces: Refuge Harbor Magnetograms, May 1924 | | 18 |
| Traces: Refuge Harbor Magnetograms, June 1924 | | 19 |

## Subject Terms

*Topics:*
Arctic regions—Research
Atmospheric electricity
Geomagnetism—Observations
Geophysics
Magnetic instruments
Meteorology—Canada—Observations
Meteorology—Greenland—Observations
Scientific expeditions

*Corporate Names:*
Carnegie Institution of Washington. Dept. of Terrestrial Magnetism

*Personal Names:*
Bauer, L. A. (Louis Agricola), 1865-1932
Goddard, Richard Halsey, 1897-1983
MacMillan, Donald Baxter, 1874-1970
Wallis, William Fisher

*Forms*:
Calculations
Correspondence
Logs (records)
Photographs
Plans (drawings)
Instrument traces

## Bibliography

Louis A. Bauer, "Department of Terrestrial Magnetism", *Carnegie Institution of Washington Yearbook No. 20* (Washington, DC: Carnegie Institution of Washington, 1921).

Louis A. Bauer, "Department of Terrestrial Magnetism", *Carnegie Institution of Washington Yearbook No. 21* (Washington, DC: Carnegie Institution of Washington, 1922).

Louis A. Bauer and John Fleming, "Department of Terrestrial Magnetism", *Carnegie Institution of Washington Yearbook No. 23* (Washington, DC: Carnegie Institution of Washington, 1924).

H. W. Fisk and H. U. Sverdrup, *Land Magnetic and Electric Observations, 1918-1926 (Researches of the Department of Terrestrial Magnetism Vol. VI)* (Washington, DC: Carnegie Institution of Washington, 1927).

**Related Collections**

*Department of Terrestrial Magnetism Photograph Collection* [partially processed]. Department of Terrestrial Magnetism, Carnegie Institution of Washington.

*Donald Baxter MacMillan Collection, 1884-1975*, George J. Mitchell Department of Special Collections and Archives, Bowdoin College Library, Brunswick, Maine.

*Instrument and Equipment Records.* Department of Terrestrial Magnetism, Carnegie Institution of Washington.

*Land Magnetic Records, 1905-1945.* Department of Terrestrial Magnetism, Carnegie Institution of Washington.

*Maud Expedition Records, 1918-1925.* Department of Terrestrial Magnetism, Carnegie Institution of Washington.

*Ocean Magnetic Records, 1905-1946.* Department of Terrestrial Magnetism, Carnegie Institution of Washington.

*The Papers of Robert Abram (Bob) Bartlett in the Dartmouth College Library, April 1985*. Rauner Special Collections Library, Dartmouth College, Hanover, New Hampshire. Contains correspondence between Bartlett and Richard Goddard related to Arctic expeditions made by Bartlett.

*Second International Polar Year Records, 1931-1936*. Department of Terrestrial Magnetism, Carnegie Institution of Washington.

[1] See *Land Magnetic Records, 1905-1945* and *Ocean Magnetic Records, 1905-1946*. Department of Terrestrial Magnetism, Carnegie Institution of Washington.

[2] *Donald Baxter MacMillan Collection, 1884-1975,* "Biographical Note", http://library.bowdoin.edu/arch/mss/dbmg.shtml. Accessed March 11, 2009.
[3] H. W. Fisk and H. U. Sverdrup, *Land Magnetic and Electric Observations, 1918-1926 (Researches of the Department of Terrestrial Magnetism Vol. VI)* (Washington, DC: Carnegie Institution of Washington, 1927) 209.
[4] Louis A. Bauer, "Department of Terrestrial Magnetism", *Carnegie Institution of Washington Yearbook No. 20* (Washington, DC: Carnegie Institution of Washington, 1921) 327.
[5] ibid. 334.
[6] Louis A. Bauer, "Department of Terrestrial Magnetism", *Carnegie Institution of Washington Yearbook No. 21* (Washington, DC: Carnegie Institution of Washington, 1922) 278. The tidal data is no longer extant.
[7] H. W. Fisk and H. U. Sverdrup, *Land Magnetic and Electric Observations, 1918-1926 (Researches of the Department of Terrestrial Magnetism Vol. VI)* (Washington, DC: Carnegie Institution of Washington, 1927) 209.
[8] ibid, 144-145.
[9] Louis A. Bauer and John Fleming, "Department of Terrestrial Magnetism", *Carnegie Institution of Washington Yearbook No. 23* (Washington, DC: Carnegie Institution of Washington, 1924) 163.
[10] H. W. Fisk and H. U. Sverdrup, *Land Magnetic and Electric Observations, 1918-1926 (Researches of the Department of Terrestrial Magnetism Vol. VI)* (Washington, DC: Carnegie Institution of Washington, 1927) 149.