

Ocean Magnetic Survey Records, 1905-1946



**Carnegie Institution of Washington
Department of Terrestrial Magnetism Archives
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DTM-2004-04

Introduction

Abstract: The *Galilee* was chartered by the Department of Terrestrial Magnetism in 1905 and refitted to perform magnetic survey work. The *Carnegie* was built in 1908 and launched in 1909 specifically for the magnetic survey work started by the *Galilee*. These records are the data collected on the voyages of the *Galilee* and the *Carnegie* and the reductions of that data into a usable format.

Extent: 74 linear feet: 32 record center boxes, 38 flat boxes, 8 document boxes, 30 negative boxes, 2 card file boxes

Galilee Records: 8 linear feet: 4 record center boxes, 2-14" x 18" flat storage boxes, 2-5"x7" negative boxes, 2 binder boxes, 2-12" x 15" flat storage boxes.

Carnegie Records: 66 linear feet: 28 record center boxes, 1 extra large record center box, 15-14"x 18" flat storage boxes, 2 legal-sized document boxes, 6 letter-sized document boxes, 2 card file boxes, 1 8"x10" negative box, 5-5"x7" negative boxes, 22-5" x 7" glass plate negative boxes, 8-12" x 15" flat storage boxes, 9 binder boxes

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.

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Processing: Charles Hargrove processed this collection in 2004. Kara Friend rehoused *Galilee* albums, prints and negatives into appropriate enclosures in June 2004. The original annotated prints and negative envelopes were saved as a reference file.

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Historical Note

Galilee Cruises

Matthew Turner built the *Galilee* in San Francisco in 1891. The Department of Terrestrial Magnetism (DTM) for the purpose of conducting a general magnetic survey of the globe

chartered it in 1905. The ship was refitted to minimize its effects on magnetic instruments and in September 1905 began the first of three cruises to measure magnetic variations in the Pacific.

On her first cruise, the *Galilee* departed from San Diego on September 1, 1905 sailed to Hawaii and returned to San Diego on December 9, 1905. The second cruise began in San Diego on March 2, 1906 and continued to Fanning Island, Samoa, Fiji, the Marshall Islands, Guam and Japan. On August 29, in Yokohama, Japan, the *Galilee* was partially sunk when a typhoon drove her on to a breakwater. Repairs required several days in dry dock. The *Galilee* continued her cruise on September 6 and arrived back in San Diego on October 20, 1906. The third cruise of the *Galilee* began on December 22, 1906 from San Diego. The cruise ended on May 21, 1908 at San Francisco. The third cruise covered roughly 35,000 miles, over twice the combined length of the first two cruises and included time in the North Pacific, an area that the other two cruises had not visited.

During her cruises the crew of the *Galilee* made numerous magnetic and astronomical observations on land and on sea.

Carnegie Cruises

The *Carnegie* was designed and built by the Department of Terrestrial Magnetism (DTM) in 1908-1909 for the purpose of conducting a worldwide magnetic survey. The *Carnegie* was a replacement for the *Galilee*, the first ship used by the Department for magnetic survey work. Although extensively modified, the *Galilee* contained too much metal to get accurate magnetic readings. The *Carnegie* was specifically designed to be as free from ferrous metals as possible. The *Carnegie* was launched in June 1909 and sailed the globe for the most of the next 20 years performing magnetic survey work.

Cruise I lasted from mid-1909 to early 1910 and was primarily designed as test run for the ship. Cruise II was much longer lasting from 1910 to 1913 and was the first DTM cruise to circumnavigate the globe. Cruise I and II were under the command of Capt. W.J. Peters. Cruise III was under the command of Capt. J.P. Ault. Cruise III was a relatively short cruise that went into the North Atlantic and observed a solar eclipse at Spitzbergen, Norway. Cruise IV was a much longer cruise that began in 1915. One of its main goals was a circumnavigation of Antarctica. Cruise IV came to a premature end in 1917 when events related to WWI caused it to be detained in Buenos Aires for several months. The *Carnegie* departed on Cruise V from Buenos Aires in December 1917 and traveled up the west coast of South America, through the Panama Canal and back to Washington in June 1918. For this short cruise the *Carnegie* was under the command of H.M.W. Edmonds, Ault having returned to the States by another ship. Cruise VI was another long cruise, starting from Washington in October 1919 and returning to Washington in November 1921.

After Cruise VI, the *Carnegie* was in dry dock for several years. It was extensively refurbished in 1927 and began Cruise VII from Washington on May 1, 1928. This cruise was more ambitious than the previous cruises, and a wider variety of data was collected, including biological surveys, sonic depth readings, and salinity readings. The cruise was cut tragically short when the *Carnegie* exploded during refueling in Apia, Samoa on November 29, 1929. Capt. Ault and Cabin Boy Anthony Kolar were killed, and the ship burned and sank. Luckily,

the scientific records up to mid-November had been put on a ship headed back to the United States, and as a result very little data was lost.

Scope and Content

This collection contains the scientific records of the cruises of the *Galilee* and the *Carnegie*. The collection consists of mainly logbooks and cahiers that chronicle the scientific activities of the Department of Terrestrial Magnetism during the ocean magnetic surveys conducted from 1905-1929.

Arrangement

The material is arranged in two series, Series 1: Records of the *Galilee* and Series 2: Records of the *Carnegie*. Series 1 is further subdivided into four subseries:

- Subseries 1: Data, 1905-1908
- Subseries 2: Reductions, 1909, 1911-1913, 1915-1916, 1918
- Subseries 3: Navigation, 1905-1908
- Subseries 4: Images, 1905-1908

Series 2 is subdivided into seven subseries:

- Subseries 1: Data, 1909-1929
- Subseries 2: Reductions, 1905-1932, 1936-1937, 1940-1941, 1945-1946, n.d.
- Subseries 3: Navigation, 1905-1921, 1928-1929
- Subseries 4: Images, 1909-1929
- Subseries 5: Instructions and Correspondence, 1914-1921, 1923, 1928, 1930, 1936
- Subseries 6: Reports, 1912, 1914, 1928-1929, 1933
- Subseries 7: Biological Results, 1928-1929, 1931-1936

Series 1: *Galilee* Records, 1905-1909, 1911-1913, 1915-1916, 1918

This series contains all the records arising from the cruises of the *Galilee*. It includes observations, reductions and calculations, navigational logs, and images.

Series 1, Subseries 1: Data, 1905-1908

This series consists of the observations taken by the *Galilee* crew on her voyages, including magnetic observations, astronomical observations, atmospheric observations, ship's logs, thermograms, barograms, and chronometer logs. Most of the information is contained in observation cahiers or large bound notebooks. These items are arranged chronologically. They were not placed in folders within the box.

Series 1, Subseries 2: Reductions, 1909, 1911-1913, 1915-1916, 1918

This subseries consists of the computations that were necessary to change the raw data of the *Galilee* observations into a more usable format. The reductions are arranged chronologically.

Series 1, Subseries 3: Navigation, 1905-1908

This subseries consists of logbooks, chronometer comparisons and navigational computations used in piloting the *Galilee* on its cruises.

Series 1, Subseries 4: Images, 1905-1908

This subseries consists of images of the *Galilee*, her crew and the places visited during her cruises. The images give an interesting view of the early 20th century in the Pacific from Samoa, to Japan, to Alaska. Japan is especially well represented as the *Galilee* was wrecked in a typhoon in 1906 and the crew was stranded in Japan while repairs were effected. There are photographic prints, film negatives and glass plate negatives. The images are arranged by an indexing number given to them when they were first taken. The images are both in albums and loose. Researchers will use the albums to browse the prints. The loose images, both print and negative, are duplicates of the images that appear in the albums.

Series 2: Carnegie Records, 1905-1937, 1940-1941, 1945-1946

This series contains all the records arising from the cruises of the *Carnegie*. It includes observations, reductions and computations, navigational data, images, instructions and correspondence, reports and results from biological samples.

Series 2, Subseries 1: Data 1909-1929

This series consists of the observations taken by the *Carnegie* crew on her cruises, including magnetic observations, astronomical observations, atmospheric electricity observations, biological surveys, and penetrating radiation observations. The data exists in cahiers, and is arranged by cruise and subject. Within each subject the data is arranged chronologically.

Series 2, Subseries 2: Reductions, 1905-1932, 1936-1937, 1940-1941, 1945-1946, n.d.

This subseries consists of the computations that were necessary to change the raw data of the *Carnegie* observations into a more usable format. The titles of the various reductions are taken directly from the notebooks in which they originally resided. The reductions are roughly arranged by cruise. First there are reductions that cover one particular cruise, then there are reductions that cover more than one cruise, e.g. *Carnegie* Cruise I + II. Some of the multiple cruise reductions cover both *Carnegie* and *Galilee* data. They are grouped in the *Carnegie* series because most of the data is *Carnegie* data. There are also a number of reductions that are not associated with a particular cruise. These are arranged in alphabetical order.

Series 2, Subseries 3: Navigation, 1905-1921, 1928-1929

This series consists of the daily logs and data kept on the sailing of the *Carnegie*. It consists of logbooks, chronometer comparisons and a radio log listing the time, frequency, and locations of the radio stations that the *Carnegie* used to keep in contact with the Department of Terrestrial Magnetism. The logbooks consist of final logs and rough logs, the only real difference is that the final logs are neater and written in ink. There seem to be two versions of rough logs, one broken down by voyage and one kept strictly chronologically without regard to cruise from 1910 through 1920.

Series 2, Subseries 4: Images, 1909-1929

This series consists of images and albums of the *Carnegie*, its crew and its cruises. The photographs cover a very wide variety of location, from New York skylines to Japanese teahouses, and vistas of Easter Island moai to Antarctic whaling stations. The photographs also depict a wide variety of activities, including magnetic observation, dancing, showering, using a diving helmet attached to a hand-pumped oxygen tank and the flensing of a partially butchered

whale. There are photographic prints, film negatives and glass plate negatives. The images are arranged by an indexing number given to them when they were first taken. The images are both in albums and loose. Researchers will use the albums to browse the prints. The loose images, both print and negative, are duplicates of the images that appear in the albums.

Series 2, Subseries 5: Instructions and Correspondence, 1914-1921, 1923, 1928, 1930, 1936

This subseries consists primarily of correspondence and memos back and forth between the *Carnegie* and DTM discussing how to take measurements and how to record data. There are also some files that relate to the publication of the *Carnegie's* data after reduction. The records are arranged chronologically.

Series 2, Subseries 6: Reports, 1912, 1914, 1928-1929, 1933

This subseries consists of reports based on the data collected by *Carnegie* scientists on her cruises. The reports are arranged by cruise and then alphabetically within the cruise.

Series 2, Subseries 7: Biological Results, 1928-1929, 1931-1936

This subseries consists of records of biological sampling during the *Carnegie's* seventh cruise and reports that were prepared from those records. There are two boxes of cards listing the various biological samplings performed on board. About half of these cards are marked as having the samples analyzed by biologists and half of the cards are marked as unanalyzed. It is unclear where these samples are now, if still extant.

Folder Listing

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<i>Galilee</i> II + III – Summary of Course Observations Vol. VII, 1913, 1915	7	1
<i>Galilee</i> II + III – Horizontal Intensity, 1915	7	2
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Subject Terms

Topics: Atmospheric electricity
 Scientific expeditions
 Geophysics
 Geomagnetism
 Geomagnetism --observations
 Oceanography

Corporate Names: Carnegie Institution of Washington. Department of Terrestrial Magnetism
 Galilee (ship)
 Carnegie (ship)

Forms: Calculations
 Correspondence
 Logs (Records)
 Photographs
 Photograph albums

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- III. The magnetic work of the *Carnegie* and the urgency of new ocean magnetic surveys, by J. A. Fleming*
- IV. The *Carnegie*: its personnel, equipment, and work, by E. Moberg
- V. Gravity determinations on the *Carnegie*, by S. E. Forbush
- VI. Note on the fluorine content of rocks and ocean-bottom samples, by E. S. Shepherd
- VII. Future ocean magnetic, electric, and oceanographic surveys
- VIII. Complete bibliography of Cruise VII of the *Carnegie*, by R. M. Crow

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