

QB  
275  
.435  
no. 125  
Serial No. 353  
1926

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY  
E. LESTER JONES, Director

---

TERRESTRIAL MAGNETISM

---

**RESULTS OF MAGNETIC OBSERVATIONS  
MADE BY THE UNITED STATES COAST  
AND GEODETIC SURVEY  
IN 1925**

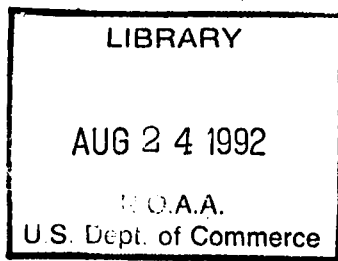
By

**DANIEL L. HAZARD**

Assistant Chief, Division of Terrestrial Magnetism

---

Special Publication No. 125



PRICE, 10 CENTS

Sold only by the Superintendent of Documents, Government Printing Office  
Washington, D. C.

---

WASHINGTON  
GOVERNMENT PRINTING OFFICE

1926

# **National Oceanic and Atmospheric Administration**

## **ERRATA NOTICE**

One or more conditions of the original document may affect the quality of the image, such as:

Discolored pages

Faded or light ink

Binding intrudes into the text

This has been a co-operative project between the NOAA Central Library and the Climate Database Modernization Program, National Climate Data Center (NCDC). To view the original document, please contact the NOAA Central Library in Silver Spring, MD at (301) 713-2607 x124 or [www.reference@nodc.noaa.gov](mailto:www.reference@nodc.noaa.gov).

LASON

Imaging Contractor

12200 Kiln Court

Beltsville, MD 20704-1387

January 1, 2006

# RESULTS OF MAGNETIC OBSERVATIONS MADE BY THE UNITED STATES COAST AND GEODETIC SURVEY IN 1925

BY DANIEL L. HAZARD, *Assistant Chief, Division of Terrestrial Magnetism and Seismology*

## CONTENTS

	Page
Introduction .....	1
Distribution of stations .....	2
Secular change of the magnetic declination .....	3
Instrumental corrections .....	4
Diurnal variation correction .....	5
Magnetic observations, table of results .....	6

## DESCRIPTIONS OF STATIONS

	Page		Page
Alaska .....	14	New York .....	27
Connecticut .....	15	North Dakota .....	27
Idaho .....	16	Oklahoma .....	28
Kansas .....	17	Oregon .....	28
Maine .....	18	Philippine Islands .....	29
Massachusetts .....	20	Rhode Island .....	33
Minnesota .....	21	Texas .....	34
Mississippi .....	21	Vermont .....	34
Montana .....	21	Washington .....	35
Nebraska .....	25	Wyoming .....	36
New Hampshire .....	26	Foreign countries .....	36

## INTRODUCTION

In 1882 the results of magnetic observations made by this bureau prior to 1881, together with descriptions of stations, were published as Appendix 9, Report for 1881. From that time to 1902 the results were published only in connection with a discussion of the distribution or the secular change of one or more of the three magnetic elements. In Magnetic Declination Tables and Isogonic Charts for 1902 the declination results were given for all stations occupied up to that time, and descriptions were given of the stations occupied subsequent to 1881. From 1903 to 1911 there was published annually an appendix to the superintendent's report giving the results of magnetic observations made during the fiscal year (July to June) covered by the report. Special Publication No. 15 contained the results of observations made between July 1, 1911, and December 31, 1912, and the results for subsequent calendar years have appeared in Special Publications Nos. 20, 25, 36, 42, 51, 55, 64, 72, 87, 94, 102, and 116.

Four magnetic observatories have continued in operation throughout the year: At Cheltenham, Md.; near Tucson, Ariz.; Sitka, Alaska; near Honolulu, Hawaii. The operation of the observatory on Vieques Island, P. R., was discontinued on November 1, 1924, and the one at the new site on the main island of Porto Rico was not put in operation until January, 1926. The observatory records have furnished the means for reducing to mean of month the values

of declination obtained from field observations. There will be found in the table the mean values of the magnetic elements for each of the observations for the year 1925.

#### DISTRIBUTION OF STATIONS

The distribution of stations by States is shown in the following table. The work in the continental part of the United States was devoted largely to the reoccupation of old stations for the determination of the change in the earth's magnetism with lapse of time. Stations were established at 13 county seats in Montana and Idaho where observations had not previously been made. A number of old stations which had been reported as no longer suitable for magnetic observations were replaced by new ones.

Declination observations were made at a large number of additional stations along the southern and southeastern shores of Alaska in connection with the triangulation. They furnished further evidence of the prevalence of local disturbances, though no especially large disturbances were found. Complete observations were secured on four of the Aleutian Islands by a party making a reconnaissance survey of those islands, made possible by the cooperation of the Coast Guard in furnishing transportation.

In the Philippine Islands the occupation of repeat stations, begun in 1924, was completed in 1925. All of the results for both years are given here. There are also given the results of declination observations at a large number of triangulation stations made between 1922 and 1925. These observations have supplied the data needed for a new isogonic chart of the islands.

There are given also the results of magnetic observations made by Lieut. B. H. Rigg of the U. S. Coast and Geodetic Survey in Greenland and Labrador, while detailed for duty with the Mac-Millan Arctic Expedition of 1925.

#### Summary of results

State	Localities	Stations	Old localities re-occupied	Declination results	Dip results	Intensity results
Alaska.....	81	81	4	81	6	6
Arizona.....	1	1	1	1	1	1
Connecticut.....	3	3	3	3	3	3
Hawaii.....	1	1	1	1	1	1
Idaho.....	6	6	4	6	6	6
Kansas.....	4	4	4	4	4	4
Maine.....	8	9	8	9	8	8
Maryland.....	1	1	1	7	8	7
Massachusetts.....	3	3	3	3	3	3
Minnesota.....	1	1	1	1	1	1
Mississippi.....	1	1	1	1	1	1
Montana.....	16	16	5	16	16	16
Nebraska.....	4	4	4	4	3	3
New Hampshire.....	1	1	1	1	1	1
New York.....	2	3	2	3	3	3
North Dakota.....	2	3	2	3	3	3
Oklahoma.....	2	2	2	2	2	2
Oregon.....	2	2	2	2	2	2
Philippine Islands.....	150	153	13	157	29	29
Porto Rico.....	4	10	0	10	2	2
Rhode Island.....	2	2	2	2	2	2
Texas.....	1	1	1	1	2	1
Vermont.....	3	3	3	3	3	3
Washington.....	3	3	3	4	4	4
Wyoming.....	2	2	2	2	2	2
Foreign countries.....	8	8	6	3	8	8
Total.....	312	324	79	330	123	121

## SECULAR CHANGE OF THE MAGNETIC DECLINATION

A comparison of the declination results at repeat stations occupied during the year with the results of earlier observations in the same localities is presented in the following table. The letter after the name of a station indicates (a) that the old station was reoccupied exactly, (b) that the new station was very near the old one, and (c) that the new station was some distance (a quarter of a mile or more) from the old one. A tabular value of the annual change refers approximately to the middle of the period from which it is derived. A plus sign indicates increasing east declination or decreasing west declination; a minus sign, the reverse. The results indicate that the annual change in the northeastern part of the country since 1920 has been somewhat greater than was indicated by the lines of equal annual change on the isogonic chart of the United States for 1920 and that in the western part of the country east declination is now decreasing as far south as Arizona.

*Comparison of declination results at repeat stations*

State and station	Former observations		Last observations		Average annual change
	Date	Declination	Date	Declination	
<b>Maine:</b>					
Portland (a).....	August, 1919.....	15 56.4 W.	October, 1925.....	16 22.9 W.	-4.3
South Paris (a).....	July, 1918.....	16 34.4 W.	do.....	17 14.9 W.	-4.4
Augusta (b).....	August, 1910.....	15 44.6 W.	do.....	15 57.0 W.	-4.8
Ellsworth (a).....	June, 1916.....	18 08.1 W.	do.....	18 49.5 W.	-4.4
Bangor (a).....	August, 1919.....	18 36.1 W.	do.....	19 07.2 W.	-5.0
Eastport (a).....	do.....	20 44.6 W.	do.....	21 12.8 W.	-4.6
Houlton (a).....	July, 1916.....	20 31.0 W.	do.....	21 07.7 W.	-4.0
Fort Kent (a).....	do.....	21 30.0 W.	do.....	21 59.3 W.	-3.2
New Hampshire: Hanover (a)	September, 1919.....	14 02.9 W.	September, 1925.....	14 33.2 W.	-5.0
<b>Vermont:</b>					
Rutland (a).....	July, 1919.....	13 39.2 W.	do.....	14 09.9 W.	-5.0
St. Johnsbury (a).....	August, 1919.....	14 55.0 W.	do.....	15 27.2 W.	-5.3
Burlington (a).....	July, 1919.....	13 58.1 W.	do.....	14 28.9 W.	-5.0
<b>Massachusetts:</b>					
Boston (a).....	May, 1916.....	14 00.4 W.	April, 1925.....	14 40.1 W.	-4.4
Worcester (a).....	September, 1919.....	13 24.1 W.	do.....	13 51.0 W.	-4.8
Newburyport (a).....	do.....	14 38.3 W.	November, 1925.....	15 08.0 W.	-4.7
<b>Rhode Island:</b>					
Kingston (a).....	do.....	13 02.1 W.	April, 1925.....	13 27.8 W.	-4.6
Providence (a).....	do.....	13 29.9 W.	do.....	13 58.0 W.	-5.0
<b>Connecticut:</b>					
New Haven (a).....	April, 1918.....	11 06.6 W.	March, 1925.....	11 48.2 W.	-4.7
New London (a).....	May, 1910.....	11 23.8 W.	April, 1925.....	12 46.5 W.	-5.2
<b>New York:</b>					
Ithaca (a).....	July, 1919.....	8 29.0 W.	do.....	8 53.8 W.	-4.3
Albany (a).....	do.....	12 19.9 W.	do.....	12 48.2 W.	-4.9
Maryland: Cheltenham Ob-	Year, 1923.....	6 32.0 W.	Year, 1925.....	6 30.2 W.	-3.6
servatory (a).....					
Mississippi: Jackson (a).....	December, 1919.....	6 29.2 E.	April, 1925.....	6 27.6 E.	-0.3
Texas: Wichita Falls (a).....	March, 1922.....	10 19.9 E.	May, 1925.....	10 18.9 E.	-0.3
<b>Oklahoma:</b>					
Marietta (a).....	October, 1922.....	9 37.1 E.	do.....	9 33.7 E.	-1.3
Guthrie (a).....	September, 1921.....	10 01.3 E.	do.....	9 55.4 E.	-1.6
<b>Kansas:</b>					
Winfield (a).....	do.....	9 48.2 E.	do.....	9 39.0 E.	-2.5
Salina (a).....	do.....	11 21.2 E.	do.....	11 15.5 E.	-1.5
<b>Nebraska:</b>					
Lincoln (a).....	do.....	10 03.7 E.	do.....	9 50.4 E.	-3.6
Newport (a).....	do.....	12 17.2 E.	do.....	12 04.8 E.	-3.4
Chadron (a).....	do.....	14 27.2 E.	June, 1925.....	14 13.4 E.	-3.7
Minnesota: Breckenridge (a)	July, 1921.....	11 50.7 E.	October, 1925.....	11 28.2 E.	-5.3
North Dakota: Bismarck (a)	do.....	14 51.2 E.	do.....	14 29.2 E.	-5.2
Wyoming: Sheridan (a).....	July, 1910.....	17 17.2 E.	June, 1925.....	16 50.6 E.	-5.2
<b>Montana:</b>					
Livingston (a).....	July, 1921.....	19 31.0 E.	do.....	19 16.8 E.	-3.6
Billings (a).....	do.....	18 07.3 E.	do.....	17 53.0 E.	-3.5
Missoula (b).....	August, 1921.....	21 32.2 E.	August, 1925.....	21 17.7 E.	-3.6
Browning (a).....	July, 1916.....	20 57.9 E.	September, 1925.....	20 30.8 E.	-3.0

*Comparison of declination results at repeat stations—Continued*

State and station	Former observations		Last observations		Average annual change
	Date	Declination	Date	Declination	
Idaho:		° ' "		° ' "	
American Falls (c).....	September, 1916.	18 33.0 E.	July, 1925.....	18 13.5 E.	-2.2
Shoshone (a).....	August, 1921.	19 59.5 E.	do.....	19 51.0 E.	-2.2
Welser (a).....	do.....	21 10.1 E.	do.....	21 00.8 E.	-2.4
Oregon:					
Portland (a).....	July, 1922.....	23 29.6 E.	August, 1925.....	23 24.4 E.	-1.7
Pendleton (a).....	August, 1921.....	21 58.2 E.	July, 1925.....	21 37.9 E.	
Washington:					
Seattle (a).....	July, 1922.....	23 45.4 E.	September, 1925.....	23 38.3 E.	-2.2
Spokane (a).....	August, 1921.....	23 35.3 E.	August, 1925.....	23 24.2 E.	-2.8
Arizona: Tucson observatory (a).....	Year 1923.....	13 47.3 E.	Year 1925.....	13 45.3 E.	-1.0
Alaska: Sitka observatory (a).....	do.....	30 28.9 E.	do.....	30 27.2 E.	-0.9
Hawaii: Honolulu observatory (a).....	do.....	9 58.9 E.	do.....	10 01.8 E.	+1.5
Philippine Islands:					
Jolo (c).....	March, 1911.....	1 36.0 E.	November, 1924.....	1 31.0 E.	-0.4
Zamboanga (a).....	July, 1911.....	1 56.8 E.	October, 1924.....	1 50.6 E.	-0.5
Davao (b).....	October, 1912.....	2 14.6 E.	November, 1924.....	2 06.0 E.	-0.8
Iligan (a).....	August, 1912.....	1 49.9 E.	March, 1925.....	1 45.5 E.	-0.4
Surigao (a).....	September, 1912.....	2 20.8 E.	January, 1925.....	2 15.0 E.	-0.5
Iloilo (b).....	June, 1912.....	1 49.8 E.	February, 1925.....	1 46.8 E.	-0.4
Tacloban (c).....	December, 1912.....	1 01.0 E.	do.....	0 59.5 E.	-0.2
Albay (b).....	June, 1912.....	0 32.5 E.	April, 1925.....	0 22.4 E.	-0.8
Calapan (c).....	November, 1912.....	1 10.2 E.	do.....	0 49.8 E.	-1.7
Batangas (a).....	May, 1912.....	0 50.4 E.	December, 1924.....	0 32.8 E.	-1.4
Antipolo (a).....	September, 1912.....	0 39.2 E.	June, 1925.....	0 29.2 E.	-0.8
Vigan (a).....	April, 1912.....	0 19.2 E.	do.....	0 06.2 E.	-1.0
Aparri (a).....	do.....	0 05.2 E.	do.....	0 08.9 W.	-1.1

## INSTRUMENTAL CORRECTIONS

The field instruments were compared with the standard instruments at Cheltenham at the beginning and end of the season. The compass declinometers used in Alaska were standardized at the magnetic station at Seattle, Wash., by comparison with the value of declination based on magnetometer observations. The compass declinometers used in the Philippine Islands were standardized at the magnetic observatory at Antipolo.

*Corrections to magnetometers*

Number	Pattern	Correction to east declination	Correction to H in parts of H
17	Coast and Geodetic Survey.....	0.0	0.0000
18	do.....	0.0	0.0000
19	do.....	0.0	-0.0008
20	do.....	0.0	0.0000
26	Wild-Edelmann.....	0.0	-0.0010
36	India Survey.....	-1.1	0.0000
37	do.....	0.0	+0.0018
38	Carnegie Institution.....	0.0	+0.0008
40	India Survey.....	0.0	0.0000

*Corrections to compass declinometers*

Num- ber	Correction to east declination
	'
1	+3.0
2	-2.0 1922-23
2	-7.8 1925
3	-3.0
4	+1.5
5	-1.5
7	-1.0
8	0.0
10	-2.4
17	+1.2

*Corrections to dip instruments*

Num- ber	Pattern	Needles	Correc- tion
			' of arc
5	Earth inductor, Carnegie Institution design.....	5	-1.2
15	Kew-Casella.....	5	0.0
		6	-1.0
23	Kew-Dover.....	2	0.0
		3	-2.2
31	Kew-Dover.....	1	-1.8
		2	+1.6
		3	-1.2
36	Kew-Dover.....	1	0.0
		2	-1.3
5678	Kew-Casella.....	2	0.0
		5	+2.8

## DIURNAL VARIATION CORRECTION

Each value of the magnetic declination has been corrected for diurnal variation with the aid of the continuous observations at the nearest observatory or observatories. No attempt has been made to correct the dip and intensity results for diurnal variation.

## ARRANGEMENT OF TABLE

The results presented in the table are arranged by States alphabetically and the results for each State are given in the order of increasing latitudes. The latitudes and longitudes are in most cases the results of solar observations made with the small theodolite which forms a part of the magnetometer. Where declination was determined with a compass declinometer, the azimuth and geographic position were obtained from the triangulation. The horizontal intensity is expressed in terms of the one-hundred-thousandth part of a C. G. S. unit of intensity of magnetic force, termed a gamma and designated by the Greek letter  $\gamma$ .

The numbers shown as a decimal in the column headed "D. C." indicate the needles used. Dip circle 5678 is designated 78 in the table. Where the number in the magnetometer column is in italics, the declination observations were made with a compass declinometer.

The observer is indicated by the initials of his name. The names of the observers are:

G. L. Anderson.  
D. H. Askew.  
C. I. Aslakson.  
R. J. Auld.  
G. L. Bean.  
V. A. Bishop.  
H. L. Bloomberg.  
R. R. Bodle.  
J. A. Bond.  
K. G. Crosby.  
C. M. Durgin.  
F. L. Gallin.  
L. D. Graham.

George Hartnell.  
Wallace M. Hill.  
R. D. Horne.  
A. J. Hoskinson.  
A. F. Jankowski.  
F. E. Joekel.  
G. C. Jones.  
H. A. Karo.  
E. H. Kirsch.  
B. E. Lancaster.  
E. B. Latham.  
A. K. Ludy.  
H. E. McComb.

C. D. Meaney.  
F. L. Peacock.  
O. S. Reading.  
B. H. Rigg.  
J. S. Rosenthal.  
W. M. Scaife.  
G. Shelton.  
S. G. Townshend.  
F. P. Ulrich.  
H. C. Warwick.  
W. Weidlich.  
M. O. Witherbee.  
L. M. Zeskind.

*Magnetic observations on land*

Station	Latitude	Longitude	Date	Declination	Dip	Horizontal Intensity	Instruments		Observer
							M.	D. C.	
ALASKA									
Adak Island:	° /	° /	1925	East	° /	γ			
Mag.....	51 49.5	176 46.3	June 4, 5	10 00.9	63 33.0	22210	18	23.32	G. C. J.
Southeast Base.....	51 49.4	176 46.2	June 12	9 43.4			12		G. C. J.
Old.....	51 49.2	176 46.5	June 13	9 43.4			12		G. C. J.
Atka Island:									
Mag.....	52 12.2	174 11.8	July 8, 10	12 55.9	64 27.6	21610	18	23.32	G. C. J.
West Base.....	52 12.1	174 12.1	July 14	11 47.6			12		G. C. J.
Ster.....	52 12.1	174 11.8	do	8 23.4			12		G. C. J.
Bob.....	52 12.4	174 11.6	July 18	7 51.9			12		G. C. J.
Isle.....	52 12.6	174 09.0	July 25	10 27.6			12		G. C. J.
Umnak Island:									
Mag.....	52 56.7	168 51.5	Aug. 25, 26	14 04.0	65 18.2	21054	18	23.32	G. C. J.
Northeast Base.....	52 57.1	168 51.3	Aug. 26	14 11.2			12		G. C. J.
Sar.....	52 56.7	168 52.6	Aug. 28	14 41.7			12		G. C. J.
Unalaska Island:									
Dutch Harbor.....	53 53.4	166 32.1	May 4, 9	17 00.3	66 20.4	20804	18	23.32	G. C. J.
Kaigani Strait:									
Tri.....	54 42.3	132 40.7	July 27	26 23.6			10		C. I. A.
Datzkoo.....	54 43.5	132 40.8	July 26	29 00.5			10		C. I. A.
Kaigani.....	54 45.2	132 39.4	do	28 34.3			10		C. I. A.
Slide.....	54 45.5	132 38.6	July 21	28 12.3			10		M. O. W.
Bee.....	54 45.6	132 43.0	July 26	27 50.3			10		C. I. A.
South Rocks.....	54 45.8	132 36.2	do	28 48.6			10		C. I. A.
Strait.....	54 46.0	132 40.7	July 24	33 19.2			10		C. I. A.
Led.....	54 46.1	132 43.0	July 17	27 51.8			10		C. I. A.
Alaska Peninsula:									
Fox.....	54 57.0	162 25.4	July 30	18 00.2			5		A. J. H.
Bel.....	55 04.4	162 03.4	July 18	19 16.9			5		A. J. H.
Tom.....	55 05.5	162 12.1	July 17	18 56.0			5		A. J. H.
Til.....	55 06.4	162 07.8	do	23 31.0			5		A. J. H.
Ki.....	55 07.4	162 07.7	July 11	20 13.4			5		A. J. H.
Cap.....	55 09.4	162 08.3	July 17	19 08.3			5		A. J. H.
Meares Passage:									
Nut.....	55 11.8	133 20.8	Aug. 19	28 26.3			10		M. O. W.
Diver.....	55 11.8	133 15.7	do	28 38.9			10		M. O. W.
Small.....	55 12.9	133 13.8	do	27 54.9			10		M. O. W.
Millar.....	55 13.3	133 15.1	do	28 37.9			10		M. O. W.
Antonio.....	55 17.3	133 14.5	Aug. 17	31 28.8			10		C. I. A.
Ref.....	55 17.5	133 18.8	Aug. 12	29 39.5			10		M. O. W.
Cas.....	55 17.6	133 16.3	Aug. 15	29 43.6			10		O. S. R.
Water.....	55 17.9	133 14.6	Aug. 17	29 26.9			10		C. I. A.
Verde.....	55 18.1	133 17.8	do	31 19.0			10		C. I. A.
Adrian.....	55 19.1	133 17.8	do	29 38.5			10		C. I. A.
Falls.....	55 19.7	133 16.3	do	29 30.6			10		C. I. A.



## Magnetic observations on land—Continued

Station	Latitude	Longitude	Date	Declination	Dip	Horizontal intensity	Instruments		Observer
							M.	D. C.	
ALASKA—continued									
Chatham Strait:			1925	East					
Cape	56 00.0	134 08.1	Sept. 3.....	29 56.0			7		F. E. J.
Mac	56 01.3	134 10.5	Sept. 2.....	29 59.2			7		E. B. L.
Apple	56 07.0	134 15.6	Aug. 20.....	30 05.0			7		F. E. J.
Bel	56 09.2	134 15.3	Aug. 19, 26	30 17.2			7		F. E. J.
Tab	56 09.7	134 15.8	do.....	30 33.2			7		F. E. J.
Sou	56 15.9	134 16.2	Aug. 20, 22	30 24.4			7		F. E. J.
On	56 16.2	134 38.6	Sept. 14.....	30 13.3			7		F. E. J.
Tin	56 16.4	134 14.7	Aug. 20, 22	31 17.3			7		F. E. J.
Harris	56 17.2	134 17.9	Aug. 20.....	31 24.2			7		F. E. J.
St	56 17.3	134 39.0	Sept. 16.....	30 23.7			7		E. B. L.
Ton	56 17.7	134 14.1	Aug. 20, 22	31 43.7			7		F. E. J.
Ell	56 17.9	134 38.4	Sept. 16.....	30 01.6			7		E. B. L.
Arm	56 19.5	134 38.1	Sept. 6.....	30 05.4			7		F. E. J.
Tor	56 23.2	134 38.3	Sept. 16.....	31 15.2			7		G. S.
Don	56 23.5	134 38.6	do.....	30 03.0			7		G. S.
Wall	56 24.0	134 38.0	Sept. 4.....	30 17.3			7		E. B. L.
Baranof Island:									
Pat	56 44.4	135 13.0	Aug. 28.....	30 09.9			8		C. M. D.
Nec	56 46.2	135 27.8	Sept. 3.....	30 15.5			8		C. M. D.
Woodhouse	56 49.5	135 32.1	do.....	30 05.1			8		C. M. D.
Springs	56 49.9	135 21.9	Sept. 4.....	30 13.9			8		C. M. D.
Sitka observatory	57 03.0	135 20.1	Year.....	30 27.2	74 22.2	15524	37	2 EI	F. P. U.
Pybus Bay:			1924						
Far	57 12.7	134 05.0	Oct. 7.....	30 32.6			4		D. H. A.
Round	57 15.5	133 56.1	do.....	30 49.0			4		D. H. A.
Mid	57 18.2	134 05.5	Oct. 8.....	30 57.2			4		D. H. A.
Deer	57 18.9	134 00.4	Oct. 7.....	30 37.9			4		D. H. A.
Dave	57 10.1	134 07.5	Oct. 8.....	30 48.9			4		D. H. A.
Gambler Bay:			1925						
Price	57 25.8	133 53.2	May 14, 15	30 53.8			7		B. E. L.
Bier	57 29.0	133 50.9	do.....	31 00.4			7		B. E. L.
Kow	57 29.1	133 56.4	May 20.....	30 53.6			7		B. E. L.
Chap	57 29.7	133 53.8	May 14, 15	30 48.2			7		B. E. L.
Muse	57 27.4	133 67.3	May 15, 16	30 54.0			7		B. E. L.
Treo	57 27.5	133 55.4	do.....	29 47.6			7		B. E. L.
Romp	57 27.5	133 52.4	May 14, 15	31 01.0			7		B. E. L.
Row	57 27.6	133 59.9	April, May	31 04.1			7		B. E. L.
Rock	57 28.0	133 64.4	May 14, 15	30 50.0			7		B. E. L.
Ile	57 28.1	134 01.8	May 20.....	30 41.6			7		B. E. L.
Nose	57 28.2	133 55.9	May 15, 16	30 44.3			7		B. E. L.
Kan	57 28.5	133 58.2	do.....	30 35.6			7		B. E. L.
Butt	57 29.3	134 00.8	May 20.....	30 59.8			7		B. E. L.
Chichagof Island:									
Edward	57 39.9	136 15.1	Sept. 29.....	30 30.2			8		W. M. S.
Imp	57 43.0	136 17.1	Oct. 10.....	30 08.0			8		E. H. K.
Start	57 44.2	136 12.7	Sept. 25.....	30 39.8			8		A. F. J.
Pine	57 47.7	136 23.2	do.....	30 37.8			8		A. F. J.
Gaff	58 11.5	136 25.1	June 2.....	31 32.3			8		W. M. S.
ARIZONA									
Tucson observatory	32 14.8	110 50.1	Year.....	13 45.3	59 30.6	20687	40	3 EI	A. K. L.
CONNECTICUT									
New Haven	41 10.4	72 55.1	Mar. 26.....	11 48.2	72 36.9	17152	38	36.12	R. R. B.
New London	41 21.0	72 06.7	Apr. 3, 4.....	12 40.5	72 46.2	17199	38	36.12	R. R. B.
Hartford	41 47.3	72 41.6	Mar. 31.....	12 40.1	73 01.2	16924	38	36.12	R. R. B.
HAWAII									
Honolulu observatory	21 19.2	158 03.8	Year.....	10 01.8	39 25.9	28708	36	4 EI	H. E. M.
IDAHO									
American Falls	42 47.1	112 51.4	July 9-14.....	18 13.5	68 51.4	20906	38	5 EI	R. R. B.
Pocatello	42 51.7	112 25.9	July 7, 8.....	17 59.0	69 01.2	20595	38	5 EI	R. R. B.
Shoshone	42 55.9	114 24.8	July 15, 16.....	19 51.0	69 10.9	19930	38	5 EI	R. R. B.
Idaho City	43 49.7	116 50.1	July 22.....	20 03.0	68 54.5	20604	38	5 EI	R. R. B.
Payette	44 04.4	116 56.1	July 25.....	20 40.9	68 57.0	20744	38	5 EI	R. R. B.
Weiser	44 15.7	116 57.9	July 27, 28.....	21 00.8	69 05.0	20698	38	5 EI	R. R. B.

## Magnetic observations on land—Continued

Station	Latitude	Longitude	Date	Declination	Dip	Horizontal Intensity	Instruments		Observer
							M.	D. C.	
KANSAS									
	° ' "	° ' "	1925	East	° ' "	γ			
Winfield.....	37 14.7	96 59.0	May 13....	9 39.0	67 36.0	22154	38	5 EI	R. R. B.
McPherson.....	38 22.7	97 37.0	May 14, 15	10 33.4	68 07.5	21661	38	5 EI	R. R. B.
Salina.....	38 49.0	97 37.2	May 16....	11 15.5	68 32.2	21362	38	5 EI	R. R. B.
Belleville.....	39 50.1	97 37.9	May 19, 20	10 17.8	69 44.0	20384	38	5 EI	R. R. B.
MAINE									
				West					
Portland.....	43 40.9	70 18.3	{Sept. 30- Oct. 1	16 22.9	73 56.2	16058	19	36.12	W. M. H.
South Paris.....	44 12.8	70 30.5	Oct. 31....	17 14.9	74 27.8	15475	19	36.12	W. M. H.
Augusta.....	44 20.1	69 45.6	Oct. 27, 28.	16 57.0	74 37.4	15391	19	36.12	W. M. H.
Ellsworth.....	44 32.6	68 24.8	Oct. 21....	18 49.5	74 31.6	15321	19	36.12	W. M. H.
Bangor.....	44 43.2	68 48.2	Oct. 23, 24.	19 07.2	74 33.2	15291	19	36.12	W. M. H.
Bangor, Aux. A.....	44 48.2	68 48.2	Oct. 24....	19 12.2			19		W. M. H.
Eastport.....	44 54.9	66 59.7	Oct. 18....	21 12.8	74 07.2	15824	19	36.12	W. M. H.
Houlton.....	46 07.0	67 53	Oct. 14....	21 07.7	75 13.2	14698	19	36.12	W. M. H.
Fort Kent.....	47 15.2	68 35.8	Oct. 7-12..	21 59.8	75 57.3	14084	19	36.12	W. M. H.
MARYLAND									
Cheltenham observatory.	38 44.0	76 50.5	Year.....	6 39.2	71 00.5	18870	26	26 EI	G. H.
Do.....	38 44.0	76 50.5	Jan. 20....		71 01.4			36.12	G. H.
Do.....	38 44.0	76 50.5	Feb. 2....	6 37.8		18898	19		G. H.
Do.....	38 44.0	76 50.5	Apr. 14....		71 01.4			5 EI	G. H.
Do.....	38 44.0	76 50.5	June 1....		70 59.8			31.12	S. G. T.
Do.....	38 44.0	76 50.5	Aug. 28, 31	6 39.8		18882	19		G. H.
Do.....	38 44.0	76 50.5	Nov. 10-13	6 41.2	71 02.6	18811	20	78.25	R. R. B.
Do.....	38 44.0	76 50.5	Nov. 17, 18	6 41.5	71 02.2	18836	19	5 EI	R. R. B.
Do.....	38 44.0	76 50.5	Dec. 7, 8..	6 40.5	70 59.8	18827	38	36.12	G. H.
Do.....	38 44.0	76 50.5	Dec. 14, 16.	6 41.2	71 01.8	18827	18	23.23	G. C. J.
MASSACHUSETTS									
Boston.....	42 20.2	71 00.7	Apr. 9.....	14 40.1	73 06.0	16748	38	36.12	R. R. B.
Worcester.....	42 16.7	71 48.5	Apr. 11....	13 51.0	73 18.2	16618	38	36.12	R. R. B.
Newburyport.....	42 47.3	70 48.6	Nov. 4.....	15 08.0	73 31.8	16305	19	36.12	W. M. H.
MINNESOTA									
Breckenridge.....	46 15.5	96 35.5	Oct. 26....	East 11 28.2	75 41.4	15159	38	5 EI	R. R. B.
MISSISSIPPI									
Jackson.....	32 20.0	90 10.9	Apr. 27....	6 27.6	64 13.6	24036	38	36.12	R. R. B.
MONTANA									
Livingston.....	45 39.7	110 36.2	June 29....	19 16.8	71 45.2	18590	38	5 EI	R. R. B.
Hardin.....	45 43.6	107 37.0	June 18, 19	18 09.3	72 28.5	18073	38	5 EI	R. R. B.
Billings.....	45 46.3	108 32.4	June 25, 26	17 53.6	72 17.8	18258	38	5 EI	R. R. B.
Hysham.....	46 16.8	107 14.1	June 23, 24	17 30.5	72 46.9	17870	38	5 EI	R. R. B.
Ryegate.....	46 18.9	109 15.2	Oct. 2.....	19 14.1	72 36.0	17950	38	5 EI	R. R. B.
Harlowton.....	46 25.4	109 50.9	Sept. 30....	19 48.3	72 35.0	17943	38	5 EI	R. R. B.
Missoula.....	46 51.7	113 58.8	Aug. 27, 28	21 17.7	71 54.8	18360	38	5 EI	R. R. B.
Glendive.....	47 06.8	104 41.6	Oct. 15, 16.	16 29.4	74 16.8	16375	38	5 EI	R. R. B.
Stanford.....	47 09.9	110 13.5	Sept. 25....	20 14.4	73 02.8	17577	38	5 EI	R. R. B.
Jordan.....	47 19.5	108 55.5	Oct. 8.....	18 50.0	74 04.4	16000	38	5 EI	R. R. B.
Circle.....	47 24.9	105 35.1	Oct. 12, 14.	17 27.3	74 17.4	16486	38	5 EI	R. R. B.
Polson.....	47 41.3	114 09.6	{Aug. 31- Sept. 1....	22 16.4	72 28.2	17869	38	5 EI	R. R. B.
Conrad.....	48 11.5	111 56.6	Sept. 18, 21	21 34.8	73 34.4	17027	38	5 EI	R. R. B.
Chester.....	48 30.7	110 59.0	Sept. 15, 16	20 35.3	73 61.7	16922	38	5 EI	R. R. B.
Browning.....	48 34.1	113 02.4	Sept. 8.....	20 30.8	73 13.0	17470	38	5 EI	R. R. B.
Cut Bank.....	48 39.0	112 19.2	Sept. 10....	21 59.6	73 62.8	16710	38	5 EI	R. R. B.
NEBRASKA									
Lincoln.....	40 49.5	96 40.8	May 22, 23	9 50.4	70 54.7	19430	38	5 EI	R. R. B.
Columbus.....	41 26.2	97 20.5	May 27....	11 03.4			38		R. R. B.
Newport.....	42 36.2	99 20.2	May 29....	12 04.8	71 34.0	18896	38	5 EI	R. R. B.
Chadron.....	42 49.1	103 00.2	June 8.....	14 13.4	71 17.2	19120	38	5 EI	R. R. B.

## Magnetic observations on land—Continued

Station	Latitude	Longitude	Date	Declination	Dip	Horizontal Intensity	Instruments		Observer
							M.	D. C.	
NEW HAMPSHIRE									
Hanover.....	43 43.0	72 16.8	1925 Sept. 26-28	West 14 33.2	74 22.6	15758	19	36.12	W. M. H.
NEW YORK									
Ithaca, old.....	42 27.0	76 28.0	Apr. 18.....	8 53.8	73 46.9	16304	38	36.12	R. R. B.
Ithaca, new.....	42 27.4	76 28.5	Apr. 20, 21	8 50.4	73 37.1	16404	38	36.12	R. R. B.
Albany.....	42 40.5	73 45.0	Apr. 16.....	12 48.2	73 43.0	16265	38	30.12	R. R. B.
NORTH DAKOTA									
Bismarck.....	46 48.4	100 47.2	Oct. 19, 20	East 14 29.2	74 50.9	16054	38	5 EI	R. R. B.
Jamestown.....	46 53.0	98 42.0	Oct. 21.....	11 20.3	75 27.7	15467	38	5 EI	R. R. B.
Jamestown, Aux.	46 53.0	98 42.0	Oct. 22, 23	11 50.2	75 38.1	15263	38	5 EI	R. R. B.
OKLAHOMA									
Marietta.....	33 55.8	97 09.6	May 7.....	9 33.7	64 01.6	24562	38	5 EI	R. R. B.
Guthrie.....	35 53.0	97 24.8	May 11.....	9 55.4	66 04.2	23090	38	5 EI	R. R. B.
OREGON									
Portland.....	45 31.0	122 42.6	Aug. 6.....	23 24.4	68 30.2	20722	38	5 EI	R. R. B.
Pendleton.....	45 40.3	118 47.4	July 31.....	21 37.9	69 24.2	20323	38	5 EI	R. R. B.
PHILIPPINE ISLANDS									
Sulu Archipelago:		East							
Cab.....	5 41.7	121 04.1	May 18.....	2 05.9			3		V. A. B.
Bol.....	5 42.2	120 48.5	1924 June 20.....	2 12.8			3		V. A. B.
Caun.....	5 45.0	120 53.9	1925 June 17.....	2 44.3			3		C. D. M.
Singaan.....	5 45.7	120 26.0	1924 June 26.....	4 23.4			3		V. A. B.
Put.....	5 49.1	121 14.1	1925 May 19.....	1 52.0			3		V. A. B.
Sul.....	5 49.8	120 48.0	1924 June 20.....	2 07.9			3		V. A. B.
Tam.....	5 52.6	121 12.5	1925 Feb. 27.....	2 14.0			3		H. A. K.
Tanum.....	5 53.1	121 14.6	1924 June 19.....	2 01.9			3		V. A. B.
Loas.....	5 53.3	120 55.4	Sept. 25.....	2 55.6			3		H. A. K.
Loas, aux.....	5 53.3	120 55.4	do.....	2 27.4			3		H. A. K.
Lub.....	5 54.1	120 59.0	Sept. 29.....	2 09.0			3		H. A. K.
Baulisa.....	5 55.2	120 52.7	Sept. 23.....	1 43.8			3		H. A. K.
Alu.....	5 57.0	120 62.5	do.....	1 52.9			3		H. A. K.
Water.....	6 00.4	121 20.8	Apr. 12.....	2 04.2			3		H. A. K.
Boal.....	6 00.6	121 16.8	Apr. 22.....	2 21.6			3		H. A. K.
Tullan.....	6 00.8	120 52.9	Sept. 23.....	1 46.0			3		H. A. K.
School.....	6 00.8	121 19.1	Apr. 22.....	2 18.3			3		H. A. K.
Candea.....	6 01.7	120 55.6	June 14.....	5 00.4			3		V. A. B.
Candea, aux.....	6 01.7	120 55.6	Oct. 15.....	West 0 39.3			3		B. H. R.
Jolo.....	6 02.7	121 00.0	Nov. 28.....	East 1 31.0	South 3 38.2	39314	20	78.25	W. M. H.
Bancu.....	6 03.9	121 10.0	July 3.....	1 19.2			3		V. A. B.
Led.....	6 04.2	121 16.2	Apr. 22.....	2 26.0			3		H. A. K.
Pat.....	6 05.0	121 03.8	July 3.....	1 50.2			3		V. A. B.
Pan.....	6 05.1	121 07.4	do.....	2 24.6			3		V. A. B.
Dan.....	6 05.2	121 00.8	Oct. 16.....	1 37.9			3		V. A. B.
Dan.....	6 05.2	121 00.8	1925 Feb. 4.....	1 37.6			3		V. A. B.
Flat.....	6 05.8	120 57.3	1924 Oct. 16.....	1 47.2			3		V. A. B.
Ticul.....	6 08.4	120 29.7	June 25.....	2 32.4			3		V. A. B.
Mabol.....	6 19.3	120 49.9	Aug. 11.....	2 21.1			3		F. L. G.

*Magnetic observations on land—Continued*

Station	Latitude	Longitude	Date	Declination	Dip	Horizontal intensity	Instruments		Observer
							M.	D. C.	
PHILIPPINE ISLANDS—continued									
Samales Group:	° ' "	East ° ' "	1923	East ° ' "	° ' "	γ			
South.....	5 56.7	121 33.5	Nov. 2	2 13.4			3		G. L. B.
Simisa.....	5 58.3	121 35.5	do.	2 10.7			3		G. L. B.
Lect.....	5 59.7	121 41.7	1922 Aug. 25	2 11.4			3		W. W.
Galao.....	5 59.8	121 31.5	1923 Nov. 1	2 17.5			3		G. L. B.
Hut.....	6 00.8	121 33.3	1922 Aug. 26	2 48.4			3		W. W.
Beach.....	6 01.9	121 32.2	1923 Nov. 1	2 18.2			3		G. L. B.
Bangal.....	6 02.2	121 33.6	1922 Aug. 26	2 4.2			3		W. W.
Manung.....	6 02.9	121 31.1	Aug. 24	1 21.3			3		W. W.
Tonguil.....	6 03.5	121 56.9	Aug. 17	2 43.7			3		W. W.
Parol.....	6 03.6	121 43.4	Aug. 15	2 105.9			3		W. W.
Pa.....	6 03.7	121 46.4	Aug. 18	2 10.9			3		W. W.
Mamad.....	6 08.5	121 46.0	Nov. 20	3 39.4			3		G. L. B.
Dipolod.....	6 09.3	121 52.4	do.	1 16.0			3		G. L. B.
Libit.....	6 10.5	121 49.2	Aug. 30	2 10.3			3		W. W.
Do.....	6 10.5	121 49.2	Nov. 20	2 17.8			3		G. L. B.
Tatalan Lighthouse	6 13.0	121 50.3	do.	2 23.0			3		G. L. B.
Talan.....	6 14.7	121 50.1	Aug. 16	2 38.6			3		W. W.
Bern.....	6 15.0	121 35.3	1923 May 20	5 32.8			3		G. L. B.
Basilan Island:			1924						
Bancao.....	6 18.4	121 57.6	May 23	1 38.8			1		C. D. M.
Tim.....	6 20.4	122 02.8	May 26	2 20.6			1		C. D. M.
Bint.....	6 23.8	122 02.4	May 27	2 01.7			1		C. D. M.
Mangal Point.....	6 24.5	121 57.4	Oct. 24	1 24.0	South 1 31.8	39378	20	78.25	W. M. H.
Mangal.....	6 24.5	121 57.4	Apr. 4	1 36.0			1		C. D. M.
Kal.....	6 26.5	122 13.1	June 10, 11	1 58.0			1		H. C. W.
Guion.....	6 27.7	122 03.8	May 12	3 35.3			1		C. D. M.
Dome.....	6 28.6	122 10.3	May 7	2 52.6			1		C. D. M.
Yacan.....	6 28.8	122 08.5	May 6	0 46.9			1		C. D. M.
Tabalungan.....	6 31.3	121 51.9	1922 Sept. 7	2 08.6			3		G. L. B.
Langasmato.....	6 31.5	121 47.5	do.	2 07.4			3		G. L. B.
Teipono.....	6 31.6	121 50.2	do.	3 27.2			3		G. L. B.
Dauau.....	6 32.4	121 45.4	do.	2 18.2			3		G. L. B.
Takela.....	6 32.9	121 48.3	Sept. 12	2 15.5			3		R. D. H.
Odel.....	6 34.3	121 44.7	Sept. 8	2 11.8			3		G. L. B.
Cobung.....	6 34.4	122 10.8	1924 June 17, 20	1 47.8			1		C. D. M.
High.....	6 34.8	121 49.7	1922 Sept. 8	2 21.4			3		G. L. B.
Tongolan.....	6 35.6	121 46.3	Oct. 27	2 13.7			3		R. D. H.
Nak.....	6 35.9	121 33.9	Oct. 26	2 07.9			3		R. D. H.
Rel.....	6 36.0	121 33.0	Oct. 25, 26	2 16.2			3		R. D. H.
Teingalaguit.....	6 36.5	121 45.2	Sept. 8	2 07.4			3		G. L. B.
Pan.....	6 36.6	121 47.6	do.	2 13.0			3		G. L. B.
Min.....	6 36.9	121 31.0	Oct. 25, 26	2 14.0			3		R. D. H.
Matanal.....	6 36.9	122 18.2	1924 June 4	1 48.9			1		C. D. M.

1 Probably artificial local disturbance.

## Magnetic observations on land—Continued

Station	Latitude	Longitude	Date	Declination	Dip	Horizontal intensity	Instruments		Observer
							M.	D. C.	
PHILIPPINE ISLANDS—continued									
Basilan Island—Con.	° ' "	East	1922	East	° ' "	γ			
Pal.....	6 37. 2	121 33. 2	Oct. 26.....	2 12. 2			3		R. D. H.
Sir.....	6 38. 1	121 33. 7	Oct. 25.....	2 13. 6			3		R. D. H.
Rok.....	6 38. 1	122 19. 3	1923 Nov. 8.....	1 37. 4			1		L. M. Z.
Nan.....	6 38. 4	121 34. 2	1922 Oct. 25.....	2 10. 6			3		R. D. H.
Tagutu.....	6 38. 7	121 38. 4	Oct. 26, 27.....	2 17. 4			3		R. D. H.
Sal.....	6 38. 9	121 34. 0	Oct. 25.....	2 06. 7			3		R. D. H.
Cuj.....	6 39. 0	121 32. 2	Oct. 25, 26.....	2 17. 4			3		R. D. H.
Bal.....	6 39. 0	121 42. 1	Oct. 27.....	1 52. 2			3		R. D. H.
Bantolinos.....	6 40. 0	121 31. 9	Oct. 26.....	1 50. 7			3		R. D. H.
Lampinigan.....	6 41. 4	121 52. 5	Oct. 28.....	2 08. 5			3		R. D. H.
Cor.....	6 43. 3	122 07. 9	1923 Nov. 9.....	2 31. 2			1		H. C. W.
Plantation.....	6 43. 7	121 57. 2	Mar. 2.....	0 49. 7			3		J. S. R.
Knob.....	6 43. 7	122 10. 0	Nov. 8.....	1 59. 4			1		L. M. Z.
Knob.....	6 43. 7	122 10. 0	1924 June 12.....	1 59. 7			1		H. C. W.
Knob.....	6 43. 7	122 10. 0	Nov. 21.....	1 58. 8			1		C. D. M.
Coco.....	6 44. 2	122 15. 5	June 12.....	2 54. 2			1		H. C. W.
Sib.....	6 44. 4	122 23. 4	1923 Nov. 7.....	2 06. 3			1		L. M. Z.
Sibago.....	6 44. 5	122 23. 8	1924 June 12, 13.....	1 57. 3			1		H. C. W.
But.....	6 44. 8	122 01. 4	1923 Nov. 13.....	2 15. 6			1		L. M. Z.
Mindanao:									
Cliff.....	5 52. 4	125 05. 4	June 2, 3.....	2 09. 4			2		J. S. R.
West.....	6 01. 6	125 07. 5	June 7.....	2 07. 6			2		J. S. R.
East Base.....	6 06. 3	125 13. 4	June 20.....	2 07. 9			2		J. S. R.
Santa Cruz.....	6 52. 0	122 04. 2	Mar. 5.....	2 01. 0			3		H. C. W.
Zamboanga.....	6 52. 3	122 03. 8	1924 Oct. 18.....	1 50. 6	South 0 41. 6	38858	20	78. 25	W. M. H.
Lemal.....	6 52. 5	122 17. 9	1923 Nov. 9.....	2 30. 3			1		L. M. Z.
Petit.....	6 54. 1	122 04. 8	Nov. 10.....	1 47. 0			1		H. C. W.
Recodo.....	6 56. 7	121 57. 9	Mar. 3.....	2 11. 6			3		J. S. R.
Davao.....	7 04. 4	125 38. 4	1924 Nov. 6.....	2 06. 0	0 30. 6	38429	20	78. 25	W. M. H.
Cotabato.....	7 13. 1	124 11. 4	Nov. 18.....	1 50. 8	0 12. 0	30090	20	78. 25	W. M. H.
Malangas.....	7 38. 1	123 02. 1	Oct. 28-30.....	2 02. 6	0 08. 8	38821	20	78. 25	W. M. H.
Iligan.....	8 13. 9	124 14. 0	1925 Mar. 16-18.....	1 45. 5	North 2 03. 4	38657	20	78. 25	W. M. H.
Tandag.....	9 04. 8	126 10. 5	Jan. 22, 23.....	1 32. 4	3 27. 0	38238	20	78. 25	W. M. H.
Surigao.....	9 47. 5	125 29. 3	Jan. 15, 16.....	2 15. 0	4 40. 8	38285	20	78. 25	W. M. H.
Negros: New Tolong.....	9 22. 2	122 47. 9	Mar. 6, 7.....	1 23. 0	4 15. 5	38696	20	78. 25	W. M. H.
Panay: Iloilo.....	10 41. 7	122 35. 1	Feb. 24, 25.....	1 45. 8	7 20. 4	38253	20	78. 25	W. M. H.
Palawan:									
Buy.....	10 41. 6	119 18. 4	1922 Oct. 23.....	1 20. 8			2		L. D. G.
Cala.....	10 42. 0	119 30. 2	Nov. 3.....	1 33. 9			2		L. D. G.
Bush.....	10 43. 5	119 20. 0	1925 May 22.....	1 23. 6			1		J. A. B.
Wedge.....	10 44. 0	119 12. 4	1922 Oct. 25.....	1 28. 8			2		L. D. G.
Lon.....	10 44. 8	119 20. 0	1925 May 21.....	1 25. 6			1		J. A. B.

## Magnetic observations on land—Continued

Station	Latitude	Longitude	Date	Declination	Dip	Horizontal Intensity	Instruments		Observer
							M.	D. C.	
PHILIPPINE ISLANDS—continued									
Palawan—Continued.	° ' "	East ° ' "	1922	East ° ' "	° ' "	γ			
Hub.....	10 45.5	119 21.6	Nov. 8.....	1 28.7	.....	.....	2	.....	L. D. G.
Seamer.....	10 46.3	119 24.6	Nov. 7.....	1 26.4	.....	.....	2	.....	L. D. G.
			1925						
Baul.....	10 46.4	119 26.5	July 17.....	1 23.0	.....	.....	1	.....	K. G. C.
Gall.....	10 47.0	119 23.9	June 10.....	1 25.8	.....	.....	1	.....	K. G. C.
			1922						
Cone.....	10 47.5	119 19.1	Nov. 9.....	1 20.9	.....	.....	2	.....	L. D. G.
			1925						
Green.....	10 48.1	119 26.0	July 17.....	1 26.2	.....	.....	1	.....	K. G. C.
Gpb.....	10 48.3	119 21.7	June 11.....	1 26.6	.....	.....	1	.....	K. G. C.
			1922						
Tantangan.....	10 48.4	119 27.3	Nov. 6, 7.....	1 25.9	.....	.....	2	.....	L. D. G.
Low Capoas.....	10 50.0	119 10.8	Nov. 11.....	1 20.1	.....	.....	2	.....	L. D. G.
			1925						
Damao.....	10 50.2	119 21.0	June 17.....	1 24.2	.....	.....	1	.....	K. G. C.
Bal.....	10 50.9	119 18.8	May 29.....	1 23.0	.....	.....	1	.....	F. L. P.
			1922						
Pivot.....	10 51.0	119 20.4	Nov. 1.....	1 26.9	.....	.....	2	.....	L. D. G.
			1925						
Mill.....	10 51.3	119 17.3	May 27.....	1 20.6	.....	.....	1	.....	F. L. P.
Bank.....	10 51.4	119 24.8	May 28.....	1 20.0	.....	.....	1	.....	J. A. B.
Ibel.....	10 51.6	119 21.2	July 18.....	1 24.4	.....	.....	1	.....	K. G. C.
Palco.....	10 52.2	119 18.8	June 1.....	1 24.0	.....	.....	1	.....	F. L. P.
Turu.....	10 52.7	119 16.4	Aug. 6.....	1 22.2	.....	.....	1	.....	G. L. A.
Ken.....	10 53.7	119 19.9	Aug. 5.....	1 19.9	.....	.....	1	.....	G. L. A.
Aita.....	10 54.4	119 17.3	Aug. 6.....	1 19.8	.....	.....	1	.....	G. L. A.
			1922						
Saddle.....	10 55.4	119 14.0	Oct. 27.....	1 26.5	.....	.....	2	.....	L. D. G.
			1925						
South.....	10 55.4	119 20.1	Aug. 5.....	1 21.5	.....	.....	1	.....	G. L. A.
Pina.....	10 55.5	119 18.8	Aug. 6.....	1 21.9	.....	.....	1	.....	G. L. A.
Black.....	10 55.9	119 20.9	Aug. 5.....	1 26.0	.....	.....	1	.....	G. L. A.
Look.....	10 56.3	119 17.0	Aug. 6.....	1 22.6	.....	.....	1	.....	G. L. A.
			1922						
Bacult.....	11 10.1	119 24.5	July 11.....	1 30.6	.....	.....	2	.....	J. S. R.
Yan.....	11 15.7	119 21.4	Aug. 7.....	1 32.0	.....	.....	2	.....	J. S. R.
			1925						
Leyte: Tacloban.....	11 14.8	124 59.5	Feb. 12, 15.....	0 59.5	North 8 47.2	38235	20	78.25	W. M. H.
Samar: Borongan.....	11 36.4	125 26.2	Feb. 7.....	0 51.2	9 39.4	38029	20	78.25	W. M. H.
			1924						
Masbate:									
Antabaoan Cove.....	12 08.2	123 14.4	Dec. 9.....	1 11.7	10 25.7	38210	20	78.5	W. M. H.
Camasuru Island.....	12 10.1	123 13.8	Dec. 4, 5.....	8 07.0	10 55.0	35151	20	78.25	W. M. H.
Alas Bay.....	12 13.0	123 17.4	Dec. 6-8.....	4 33.8	10 53.3	40207	20	78.5	W. M. H.
Malan.....	12 14.1	123 14.7	Dec. 8.....	1 12.7	.....	.....	20		W. M. H.
			1925						
Mindoro: Calapan.....	13 25.1	121 11.1	Apr. 27.....	0 49.8	13 39.0	38334	20	78.25	W. M. H.
Luzon:									
Albay.....	13 08.4	123 44.0	Apr. 8.....	0 22.4	12 14.8	38380	20	78.25	W. M. H.
			1924						
Batangas.....	13 44.9	121 03.8	Dec. 22, 23.....	0 32.8	13 40.7	38093	20	78.25	W. M. H.
			1925						
Mercedes.....	14 06.7	123 00.7	Apr. 13.....	0 48.8	14 07.8	38246	20	78.25	W. M. H.
Antipolo.....	14 35.8	121 10.0	June 19.....	0 29.2	16 03.0	38282	20	78.25	W. M. H.
Infanta.....	14 45.2	121 38.7	Apr. 18, 20.....	0 42.6	15 52.6	38318	20	78.25	W. M. H.
Vigan.....	17 33.9	120 22.9	June 11.....	0 06.2	21 41.0	37693	20	78.25	W. M. H.

## Magnetic observations on land—Continued

Station	Latitude	Longitude	Date	Declination	Dip	Horizontal Intensity	Instruments		Observer
							M.	D. C.	
PHILIPPINE ISLANDS—continued									
Luzon—Continued.	° ' "	East ° ' "	1925	West ° ' "	° ' "	γ			
Aparri.....	18 21.6	121 37.1	June 1	0 08.9	23 06.6	37513	20	78.25	W. M. H.
Port San Vicente.....	18 30.6	122 08.7	May 29	0 48.6	23 14.7	37580	20	78.25	W. M. H.
Camiguin Island:									
Font Island.....	18 54.0	121 50.4	May 28	1 26.8	24 28.4	37498	20	78.25	W. M. H.
Calayan Island: Rug.....	19 17.1	121 24.1	Sept. 29	0 17.0			2		H. L. B.
Babuyan Island.....	19 33.2	121 57.6	May 12	1 10.0	25 38.1	36838	20	78.25	W. M. H.
Ibugos Island.....	20 18.5	121 48.1	May 23	0 41.5	27 47.5	36919	20	78.25	W. M. H.
Basco.....	20 27.5	121 59.0	May 9, 10	0 04.8	27 20.4	36782	20	78.25	W. M. H.
PORTO RICO									
Friedman, East.....	18 20.2	West 66 06.6	Feb. 17.....	3 18.4			17		R. J. A.
Friedman, West.....	18 20.2	66 06.6	do.....	4 43.2			17		R. J. A.
Filtration.....	18 21.8	66 07	Feb. 7, 10.....	4 08.7		27774	17		R. J. A.
Cantero.....	18 21.3	66 07	Feb. 7, 11.....	4 15.5			17		R. J. A.
Filter house.....	18 21.3	66 07	Feb. 11.....	4 27.0			17		R. J. A.
East Hill.....	18 22.1	66 07.4	Jan., Feb.....	3 52.0	52 31.0	27797	17	15.5	R. J. A.
West Hill.....	18 22.1	66 07.4	do.....	4 20.3	52 08.5	27678	17	15.56	R. J. A.
Viville, West.....	18 23.4	66 01.7	Feb. 18.....	4 24.7			17		R. J. A.
Viville, East.....	18 23.4	66 01.7	do.....	4 21.6			17		R. J. A.
RHODE ISLAND									
Kingston.....	41 28.8	71 31.4	Apr. 6.....	13 27.8	72 51.0	17030	38	36.12	R. R. B.
Providence.....	41 45.5	71 27.9	Apr. 7.....	13 58.0	72 51.9	16939	38	36.12	R. R. B.
TEXAS									
Wichita Falls.....	33 55.8	98 29.0	May 1-4.....	East 10 18.9	63 31.8	24748	38	5 EI	R. R. B.
Do.....	33 55.8	98 29.0	do.....		63 31.4			36.12	R. R. B.
VERMONT									
Rutland.....	43 37.1	72 57.7	Sept. 16, 17.....	West 14 09.9	74 09.9	15988	19	36.12	W. M. H.
St. Johnsbury.....	44 24.0	72 00.0	Sept. 24, 25.....	15 27.2	74 41.4	15355	19	36.12	W. M. H.
Burlington.....	44 28.5	73 11.7	Sept. 19, 21.....	14 28.9	74 29.8	15701	19	36.12	W. M. H.
WASHINGTON									
Olympia.....	47 03.3	122 53.4	Aug. 11.....	East 23 48.9	70 16.7	19474	38	5 EI	R. R. B.
Seattle.....	47 33.1	122 15.2	Aug. 15.....	23 38.8	70 38.2	19068	38	5 EI	R. R. B.
Do.....	47 33.1	122 15.2	Oct. 12.....	23 37.8	70 39.2	19106	18	23.32	G. C. J.
Spokane.....	47 43.1	117 31.2	Aug. 22.....	23 24.2	71 48.1	18424	38	5 EI	R. R. B.
WYOMING									
Gillette.....	44 17.0	105 29.4	June 11-13.....	16 21.9	71 48.6	18813	38	5 EI	R. R. B.
Sheridan.....	44 50.3	106 58.1	June 15, 16.....	16 50.6	71 57.2	18487	38	5 EI	R. R. B.
FOREIGN COUNTRIES									
Nova Scotia: Sydney.....	46 08.8	60 12	June 25.....	West 26 05.8	73 50.1	15875	17	31.123	B. H. R.
Labrador:									
Battle Harbor.....	52 16.4	55 35	July 1, 3.....	34 30.9	75 44.4	15669	17	31.123	B. H. R.
Hopedale.....	55 27.1	60 10	July 9.....	38 59.2	78 25.0	11636	17	31.123	B. H. R.
Greenland:									
Godthaab.....	64 11.0	51 43	Sept. 14.....		79 31.1	10101		31.123	B. H. R.
Sukertoppin.....	65 24.5	52 54	Sept. 10.....		80 17.9	9385		31.123	B. H. R.
Holstenborg.....	66 55.9	53 38	Aug. 31.....		81 29.7	8261		31.123	B. H. R.
Igloo de Houny.....	77 45.2	70 38	Aug. 21.....		85 35.9	4526		31.123	B. H. R.
Etah.....	78 19.5	72 42	Aug. 4, 5.....		86 02.1	3900		31.123	B. H. R.

Horizontal intensity results in italics were computed from dip and total intensity results with dip circle No. 31.

## DESCRIPTIONS OF STATIONS

Magnetic observers are instructed to mark each station (except auxiliary stations for development of local disturbance) in as permanent a manner as possible, either with a stone, a draintile filled with cement, or a post of some durable wood, so that it may be available for future occupation. They are also required to furnish a sufficiently detailed description to locate the station even if the marking should be destroyed, and to determine the bearings of two or three prominent objects in addition to the one used as a reference mark in the azimuth and declination observations. The information is given in abridged form on the following pages. Further details can usually be obtained upon application to the Director of the Coast and Geodetic Survey.

The usual method of marking a stations is by a stone post about 30 inches long and 6 inches square, set so as to project 2 or 3 inches above the ground. In the center of the top is set a circular bronze plate  $3\frac{1}{2}$  inches in diameter.

When the local authorities desire it, and are willing to bear the expense, a second stone is set to mark the true meridian.

The descriptions of stations are arranged alphabetically by States and by names of stations.

### ALASKA

*Dutch Harbor, Unalaska Island.*—The station of 1915 was reoccupied. It is on Amaknak Island, on the hill just southeast of the village. It is about 164 feet south of a water tank covered with sod and 98 feet south of the azimuth mark, on a line from the azimuth mark to the astronomic station in Unalaska. The station is marked with a bronze disk set in concrete. The astronomic station at Unalaska bears  $0^{\circ} 01.0'$  west of true south.

*Mag, Bay of Islands, Adak Island.*—The station is on the top of the ridge south of the gravel beach at the mouth of the creek and nearly in line with that beach. The magnetic station (which was used also as a triangulation station), the astronomic station, and reference mark were in line along this ridge, the distance to the reference mark being 246.5 feet and to the astronomic station 300.4 feet. The station is marked by a bronze disk set in an irregular mass of concrete. The following true bearings were determined:

Triangulation station Old.....	18	55.9	W. of S.
Astronomic station.....	37	09.0	E. of S.
Left tangent to small island.....	19	21.7	W. of S.
Left tangent to small island in entrance.....	74	06.6	W. of N.
Left tangent to large island in entrance.....	63	06.6	W. of N.

Declination observations were also made at triangulation station Old, which is very near the magnetic station of 1873, and at Southeast Base.

*Mag, Atka Island.*—The station is on top of the hill south of Atka village, at an elevation of about 150 feet. It was also a triangulation station and is marked by a bronze disk set in a cylindrical mass of concrete. Triangulation station West Base bears  $78^{\circ} 03.5'$  west of true south.

Declination observations were also made at triangulation stations West Base, Bob, Isle, and Ster.



*Mag, Nikolski Village, Umnak Island.*—The station is 13 feet in from the grass line on slate beach, northeast of creek mouth. The station was used also as a triangulation station and is marked by a bronze disk set in the top of a square concrete post. The following true bearings were determined:

Cross on church steeple.....	13	49.7	W. of S.
Triangulation station Nick.....	16	42.3	W. of N.
Left tangent to Niggerhead Bluff.....	2	17.1	E. of N.

Declination observations were also made at triangulation stations North-east Base and Sar.

## CONNECTICUT

*Hartford, Hartford County.*—The station of 1904 being no longer available, a new station was established on the "West Open" of Keney Park, about 2,000 feet from the Woodland Street entrance. It is about 90 feet east of the main drive and 175 feet south by west from what is known as Rest-a-While Rock. It is on range with the center of Walter Mere Pond and the tower of Travelers Insurance Building. The station is marked by a 12-inch tile filled with concrete, set 3 feet in the ground, with a bronze disk in the top. The following true bearings were determined:

Spire on Travelers Insurance Building.....	30	22.9	E. of S.
Figure on peak of Capitol dome.....	17	29.7	E. of S.
Asylum Hill Congregational Church.....	3	56.9	E. of S.
Spire between twin towers of St. Joseph's Cathedral.....	2	50.4	E. of S.
Small spire between two larger spires on Trinity Church.....	0	03.3	E. of S.

A similar marker was set about 1,760 feet to the south to mark the true meridian.

*New Haven, New Haven County.*—The station of 1916 was reoccupied. It is on the grounds of the Yale Astronomical Observatory, 150 feet south of the transit house. The station is marked by a limestone post 8 by 8 by 30 inches, sunk flush with the surface, with a bronze disk set in the top. The following true bearings were determined:

Monument on brow of hill across valley (East Rock Soldiers' Memorial).....	76	14.2	E. of N.
Peak of water tank in valley.....	72	35.9	E. of S.
Nearest corner of brick dwelling on west side of Prospect Street.....	23	00.4	W. of N.
North edge of most northerly of two factory chimneys.....	88	36.6	W. of N.
Southeast corner of observatory office building (mark).....	21	06.7	E. of N.

*New London, New London County.*—The station of 1904 was reoccupied. It is on the south side of Garfield Avenue in a small pasture known as the pig field on the grounds of the almshouse, about 1 mile west of the city hall. It is 82 feet from the east wall of the pasture, 45 feet from the north wall, and 59 feet south-southwest from the west post of the entrance gate; it is in line with the northeast corner of the pasture wall and the southeast corner of the detention hospital. The pasture is about 85 yards square and is full of granite boulders. The station is marked by a stone post 6 by 6 by 30 inches, lettered "U. S. C. S.," set flush with the ground. The following true bearings were determined in 1904 and 1919:

Gable of frame house one-eighth mile away (mark).....	13	11.5	E. of S.
Meridian stone, center.....	0	02.0	W. of S.
Small ventilation window in large house one-eighth mile away.....	9	50.0	W. of N.
Weather vane on south end of old hospital building north of road.....	50	13.3	E. of N.

A similar stone was set in 1904, 222.8 feet to the south to mark the true meridian, but an error was made in setting as shown by the above bearing.

## IDAHO

*American Falls, Power County.*—The station of 1916 being no longer available, a new station was established in the city park in the new town site. It is opposite the junction of Idaho Street and Tybee Avenue, about 20 feet north of the prolongation of the center line of Idaho Street. Looking down this street the tip of Pillar Butte is seen in the distance. The station is 145.5 feet from the fire plug on the west side of Tybee Avenue, 83.5 feet east of the curb line of the street, 20.9 feet from the vertex of the triangle at the junction of walks in the parks, and 42.2 feet west of a hydrant in a small water box. The station is marked by a cement post with a bronze disk in the top. The following true bearings were determined:

Northeast corner of tower on St. John's Lutheran Church (at foot of blind windows)-----	34	55.8	W. of S.
Northeast corner of tower on Methodist Episcopal Church-----	60	06.8	W. of S.
Northeast corner of brick store building, level with second-floor windows-----	88	01.2	W. of N.
Right edge of large concrete elevator-----	85	12.0	W. of N.
Southeast corner of brick apartment house, level second floor-----	19	03.8	E. of N.

*Idaho City, Boise County.*—The station is on grounds at the rear of the Luna Hotel, owned by Mrs. Sadie Galbraith. It is 187.4 feet west-northwest from the west end of the west wing of the hotel, 154.8 feet from the woodshed at the rear of the hotel, and 24.7 feet northeast of the northeast corner of the barn. The station is marked by a concrete post about 14 inches in diameter, rounded on top to a bronze disk which projects about 3 inches above the ground. A similar marker was set 173.2 feet to the north, near the fence along the north edge of the field, to mark the true meridian. The following true bearings were determined:

Southwest corner of brick storehouse (mark)-----	64	23.8	E. of S.
Cross on Catholic Church-----	65	05.8	E. of S.
South side of most southerly window in house one-fourth mile away-----	89	49.8	W. of N.
Southeast corner of forest ranger's office building-----	17	33.2	E. of N.
Peak of west gable of barn 500 yards away-----	24	32.2	E. of N.

*Payette, Payette County.*—The station is about one-fourth mile east of the center of town on the high-school athletic field, just east of the school building. It is 265.2 feet east of the east end of the grand stand and 74.9 feet from the line fence along the eastern end of this field. At the request of the county surveyor a second marker was placed 326.8 feet due south, and just inside the curb along an east-and-west street. Both markers are of concrete rounded over on top with bronze disk in center, the disk being about 3 inches above the ground. Markers are about 14 inches in diameter and 20 inches deep. The following true bearings were determined:

Northwest corner of high-school building, level of second floor (mark)-----	75	03.0	W. of S.
Southwest corner of brick house one-fourth mile away (Mrs. Bird Jacobsen)-----	82	38.5	E. of S.
Center one of group of three chimneys on house one-half mile away-----	29	10.6	W. of N.
Northwest corner of cellar wall of house on corner, on west side of north-and-south street (Fourteenth) (mark)-----	5	32.5	W. of S.
Northeast corner of chimney on high school, level of roof-----	72	54.5	W. of S.

*Pocatello, Bannock County.*—The station of 1921 being no longer available, a new station was established about 100 yards to the southwest. It is on the grounds of the Idaho Technical Institute,  $1\frac{1}{2}$  miles northeast of the center of town. It is on a line perpendicular to the southwest side of the Administration Building at the center of the middle set of doors. It is 112.7 feet from the face of the retaining wall, which is about 60 feet from the building, 75 paces from Sampson Avenue and 106 paces from the street in front of the main line of buildings. The station is marked by a cement post about 12 inches in diameter at the top, projecting about 10 inches above

ground, with a bronze disk in the top. The following true bearings were determined:

Southwest corner of Administration Building, corner stone	31	06.7	E. of N.
Southeast corner of Administration Building	68	00.7	E. of N.
Hotel Bannock, northwest corner, brick near coping	86	17.8	W. of S.
Old Flower mill, most northerly edge	52	01.3	W. of N.
Salt Lake Hardware Building, southwest corner under coping	57	28.5	W. of S.

*Shoshone, Lincoln County.*—The station of 1921 was reoccupied. Observations were made over a lava block about 10 inches square on top and showing about 8 inches above ground. This stone is set firmly in a slanting position and marks the southeast corner of the township. It is placed where a dry irrigation ditch running along the eastern side of the township turns and runs along the southern side, about half a mile from the town's center. The land to the east belongs to the Oregon Short Line Railroad Co. The following true bearings were determined in 1910 and 1921:

Southern gable on cupola on ice house one-fourth mile away	35	32.0	E. of N.
Northwest corner of large brick smokestack, at top	63	31.1	E. of N.
Southern gable of easternmost railroad shops building	73	24.9	E. of N.
Southeast corner (low down) of railroad shops building, next to stack	65	07.3	E. of N.
Center of fireplace chimney on house one-half mile away	87	31.0	W. of S.

*Weiser, Washington County.*—The station of 1910 was reoccupied. It is about  $1\frac{1}{2}$  miles north of the center of the town, about 1,000 feet north of the north city reservoir, on the grounds where the Congregational Academy formerly stood. The shell of the westernmost one of the former academy buildings still stands and the station is 147.3 feet southeast of the southeast corner of this building. It is also 180.8 feet southwest of the southwest corner of the remnants of the foundation of the middle building, and 195 feet south of the fence on the north side of the field. The station is marked by a rough white sandstone 7 by 10 by 27 inches, with a bronze disk set in the top, projecting about 3 inches above ground. The following true bearings were determined in 1910 and 1925:

Near edge of base of chimney on large central building at college	80	04.9	W. of N.
Center of window of small house on elevator	20	35.0	W. of S.
Center of chimney at high school $1\frac{1}{4}$ miles away	9	43.4	E. of S.
Center elevator tower on Washington Hotel	2	27.1	W. of S.
Near corner of clock tower, large main building at college	83	32.9	W. of N.

#### KANSAS

*Belleville, Republic County.*—The station of 1902 being no longer available, a new station was established in the southeast corner of the fairgrounds, about 1 mile northeast of the courthouse. It is 43 feet from the east line fence, 148 feet from the south line fence, about 300 feet northwest of a small farmhouse, and about 20 feet northeast of the line between the center of the farmhouse and the east end of the grand stand. The station is marked by a round cement post about 7 inches in diameter, projecting about 2 inches above the ground, with a bronze disk in the top. The following true bearings were determined:

East edge water tank about 600 yards away	26	13.1	E. of S.
Large spire on courthouse	29	10.1	W. of S.
Small spire to left of courthouse spire	27	59.1	W. of S.
South edge of water tank, one-half mile away	86	15.9	W. of N.
Peak of cupola on large fair building	84	14.9	W. of N.

A marble post 24 by 8 by 8 inches, lettered "U. S. C. & G. S., 1902," was set about 182 paces to the north to mark the true meridian. It is within about 3 feet of the fence around the race track.

*McPherson, McPherson County.*—The station of 1904 was reoccupied. It is on the grounds of McPherson College, a little more than 1 mile east of the

business center of the city. Measurements were made from the station, north-easterly to the southwest corner of the main building, 323.5 feet; westerly to the mulberry hedge bounding the grounds, 41.5 feet; southwesterly to an elm tree, 38.5 feet; southerly to two red cedars, 33 feet and 33.7 feet, respectively, the former being the most easterly of a group. The precise point is marked by a hole in the top of a Bedford limestone post 6 by 6 by 27 inches, set flush with the surface and marked "U. S. C. & G. S., 1904." The following true bearings were determined in 1904 and 1925:

McPherson College tower-----	45	59.5	E. of N.
Southwest corner of gymnasium-----	15	25.5	E. of N.
Peak, southeast gable on church, 100 yards away-----	76	25.5	W. of N.
Northeast gable on same church-----	62	04.5	W. of N.
South edge of chimney on house about 150 yards away-----	79	27.5	W. of S.

*Salina, Saline County.*—The station of 1921 was reoccupied. It is on the grounds of the Kansas Wesleyan University, 209.2 feet south and a little east of the southeast corner of the dwelling across the street, and 300 feet (about) west of the tracks of the McPherson branch, Union Pacific Railroad. It is marked by a limestone post 6 by 6 by 30 inches, set flush with the ground, and lettered "U. S. C. & G. S., 1904." The following true bearings were determined:

Top of clock tower-----	10	31.1	W. of S.
Tip of fire plug front of main building-----	76	36.0	W. of S.
Vertical iron pipe, center of fountain-----	88	13.5	W. of N.
I, in "Science Hall," cut in stone over door-----	71	28.1	E. of S.
Southeast corner of main building above basement-floor level (new building)-----	40	49.1	W. of S.

*Winfield, Cowley County.*—The station of 1921 was reoccupied. It is in the northwest corner of the campus of Southwest Kansas College, 330.5 feet from the northwest corner of the college building, 117 feet from the porch of the house on the north side of the road, and 28.4 feet from a pine tree to the southwest. The station is marked by a limestone post 7 by 8 by 36 inches, set flush with the ground, and lettered on top "U. S. C. & G. S., 1902." The following true bearings were determined in 1911 and 1925:

Southwest corner of old college building (mark)-----	33	46.8	E. of S.
Northeast corner of a house (near ground)-----	66	49.8	W. of S.
West gable of house on hill-----	78	24.0	E. of N.
West gable of dormer window 500 yards away-----	39	00.1	E. of N.

#### MAINE

*Augusta, Kennebec County.*—A new station was established about 75 feet west of the probable location of the station of 1910. It is on a terrace about 100 feet a little west of south from the highest point on Main Top Rock, about 150 feet south from high-voltage power line and about 1½ miles north from the town's center. It is about 43 feet east from a witness cross cut in a vertical rock ledge and about 80 feet southwest from another witness cross cut also in a vertical ledge. The station is the top of a large granite boulder, with a cross and the letters "U. S." cut in the top. The boulder shows about 2 inches above the ground. The following true bearings were determined.

Apex of statue of capitol dome (mark)-----	11	45.3	W. of S.
Top of steeple of Methodist Episcopal Church-----	5	27.8	W. of S.
Top of steeple of old Catholic Church-----	3	07.7	W. of S.
Base of cross on new Catholic Church tower-----	4	40.2	E. of S.
Top of cupola of a large red stable-----	71	29.4	W. of S.

*Bangor, Penobscot County.*—The station of 1919 on Thomas Hill, near the center of a vacant lot owned by Mr. Prentiss, was reoccupied. It is 76.3 feet northeast of a tree, 126.1 feet from the fence on the north side of Highland Avenue, and 133.9 feet from the fence on the west side of Governor Davis's yard. Since 1919 a small sheet iron garage has been built 90 feet southwest of the station. The station is marked by a granite boulder smoothed on the

top and lettered "U. S. C. & G. S." The following true bearings were determined:

Flagpole on reservoir 400 feet away-----	24	27.4	E. of N.
Near edge of lower chimney on house-----	15	58.0	E. of S.
North edge of house 250 feet away-----	44	40.7	W. of N.
West edge of window in center of south door of house next northeast of reservoir-----	34	56.1	E. of N.

Declination observations were also made at an auxiliary station about 200 feet to the northwest, to test for local disturbance.

*Eastport, Washington County.*—The station of 1919 was reoccupied. It is about one-sixth mile northwest of the Eastport standpipe, in a pasture belonging to J. R. Roche. It is south of the eastern one of two prominent ledges known as the "Batteries," about 450 feet from the main road to the east, 200 feet from a fence to the south. It is just south of the rocky knoll on which the old station was located, 125 feet south of the road leading across the pasture to the baseball grounds, 114.6 feet from an iron pin in a rocky ledge to the south. A second iron pin is 118.4 feet northeast from the station in a ledge near the road. The station is marked by a bronze disk set in a cement base 14 inches square. The following true bearings were determined in 1919 and 1925:

Lighthouse on Eastpoint (Canadian side) (mark)-----	11	15.3	E. of S.
Spire of Unitarian Church-----	27	24.0	E. of S.
Near edge of high-school building at second story-----	77	08.6	E. of S.
Left edge of standpipe-----	72	11.0	E. of S.
Top of Christian Church tower-----	43	47.0	E. of S.

*Ellsworth, Hancock County.*—The station of 1916 was reoccupied. It is one-half mile east of the center of town in the old fairgrounds, about 180 feet south of the entrance gate. It is outside of the race track, and about 8 feet west of the foot of the embankment at the west end of the course. The station is marked by a concrete block 6 by 6 inches on top and projecting 4 inches above ground. The following true bearings were determined in 1916:

Cross on Catholic Church (mark)-----	80	20.3	W. of S.
Southeast corner of brown house-----	42	02.8	W. of S.
East point on roof of house of ex-Senator Eugene Hale-----	25	35.4	W. of N.
Vane on steeple of Congregational Church-----	86	31.6	W. of S.

*Fort Kent, Aroostook County.*—The station of 1916 was reoccupied. It is on the point on which stands the old blockhouse of 1838, on land owned by Mr. Dickey, and across the street from his residence. It is 136 feet slightly east of south from the southeast corner of the blockhouse and 24 feet west from the edge of the bank and just west of the trail leading to the blockhouse. It is marked by a cement post 12 inches in diameter and 40 inches long, having a bronze disk set in the top, setting flush with the ground. The following true bearings were determined in 1916:

Cross on Catholic Church (mark)-----	74	35.4	E. of N.
East side of top of tower of new Catholic Church-----	59	18.6	E. of N.
North gable of Dickey Hotel-----	28	18.8	E. of S.

*Houlton, Aroostook County.*—The station of 1916 was reoccupied. It is in the parade grounds of old Hancock Barracks, about 1 mile east of town. The exact point is over the center of the central granite pier of the three piers which mark the county meridian. The point of the southern pier was used as the mark and found to bear  $0^{\circ} 03'$  east of true south.

*Portland, Cumberland County.*—The station is in Evergreen Cemetery, about three miles northwest of the city hall. The station is among the trees at the northwest corner of the old part of the cemetery. It is about 40 feet southwest of the southwest end of the lower pond, 137 feet northwest from the center of Northern Avenue, and 95 feet northeast from the center of Valley Avenue in the cemetery. It is 59 feet southeast from the southeast corner of a frame building used as a tool and store house. The station is marked by a gray granite stone 8 by 8 by 30 inches, bearing a bronze disk dated

1919 on its top. The stone was left projecting 6 inches above ground. The following true bearings were determined:

Letter I in "Lincoln" on Lincoln C. Daniels monument, 200 feet away	16	57.3	E. of S.
Center of chimney on house one-half mile away, across railroad	43	19.8	E. of N.
Tip on railroad water tank one-half mile away	48	37.8	E. of N.
Tip of Higgins and Graffam monument 250 feet away	24	35.5	E. of S.

*South Paris, Oxford County.*—The station of 1916 was reoccupied. It is on land belonging to the county, in a pasture about 550 feet west from the courthouse. It is 36.2 feet from the west boundary fence, 70.5 feet from the stone wall which marks the south boundary. The station is marked by a bronze disk set in the top of a cement post 8 by 8 by 30 inches, projecting 5 inches above the ground. The following true bearings were determined in 1916 and 1925:

Pinnacle of courthouse dome	79	07.1	E. of S.
Cross cut in boulder 66 feet distant	37	09.4	E. of N.
Cross cut in boulder 78 feet distant	71	56.0	W. of N.

#### MASSACHUSETTS

*Boston, Suffolk County.*—The station of 1916 was reoccupied. It is on Castle Island, south of Fort Independence, about 50 feet northwest of the station of 1905. It is 143 paces from the south entrance to the fort and 6 feet west of a direct line from the south entrance of the fort to a large tank on a distant hill to the south. It is also 142 paces from the southeast corner of the fort, 153 paces from the southwest corner, and 63 paces from a small walk in a direct line to the south entrance. The station is marked by a limestone post 6 by 6 by 32 inches, projecting 1 inch above ground, and lettered "U. S. C. & G. S., 1905." The following true bearings were determined in 1906:

Central flagpole on Marine Park head house (mark)	67	36.4	W. of S.
White spire in South Boston	81	40.6	W. of S.
Southwest corner of fort above stone foundation	18	02.5	W. of N.
Southeast corner of fort below top coping	38	23.5	E. of N.
Long Island Lighthouse	80	56.4	E. of S.
Spectacle Island Lighthouse	64	48.4	E. of S.

*Newburyport, Essex County.*—The station of 1919 was reoccupied. It is on the west side of Plum Island, about two-thirds of a mile south of Shore Acres Hotel. It lies between the road and a small river near some sand hills, 176.5 feet northwest of the northwest corner of the veranda of Meadowview Cottage and 75 feet from the river. The station is marked by a bronze disk set in the top of a granite post, 7 by 7 by 30 inches, projecting 10 inches above the ground. The following true bearings were determined in 1916 and 1919:

Butler's "Toothpick"	21	07.3	W. of N.
Congregational Church spire (Oldtown)	74	30.0	W. of N.
Gable of red cottage, one-fourth mile south	13	01.0	E. of S.
Center of brick chimney at electric light plant	60	12.0	W. of N.

*Worcester, Worcester County.*—The station of 1898 was reoccupied. It is on the larger of the two small islands in Salisbury Pond, Institute Park, just north of the Worcester Polytechnic Institute. The point is marked with a granite post 4½ feet long, projecting 8 inches. The following true bearings were determined from the meridian line:

Church spire (Congregational) just to right of pavilion	29	49.6	E. of S.
West edge of brick chimney near middle of high building at institute	5	58.6	W. of S.
Center of small window in highest part of Bancroft Tower	75	19.9	W. of S.
Center of large brick stack at American Steel & Wire Co.	72	01.3	E. of S.
Low steeple just to left of light-plant high brick stacks	56	03.1	E. of S.

A new building has been constructed between the meridian stones since 1898, but the meridian has been carefully marked by a black-and-white disk just above one of the windows at the northeast corner of the building.

## MINNESOTA

*Brookenridge, Wilkin County.*—The station of 1921 was reoccupied. It is in the south side of the county courthouse yard, 22.6 feet from the tree row on the south and 78.5 feet from the cement walk on the west side of the yard. It is marked by a limestone post 6 by 6 by 24 inches, set flush with the ground, and lettered "U. S. C. & G. S., 1909." The following true bearings were determined in 1909 and 1914:

Northwest corner of St. Francis Hospital, above water table (mark) .....	61	22.4	W. of S.
Cross on cupola of St. Francis Hospital .....	48	56.5	W. of S.
Northwest corner of school building east of courthouse .....	76	05.2	E. of N.
Southeast corner of school building .....	86	42.6	E. of N.
Southeast corner of St. Francis Hospital .....	37	24.5	W. of S.

## MISSISSIPPI

*Jackson, Hinds County.*—The station of 1919 was reoccupied. It is about 2 miles north from the Capitol, on the grounds of the Millsaps College. The station is on the south side of Observatory Hill, about 300 feet south of the observatory and 224.5 feet east of the fence along the street. The station is marked by a limestone post, 6 inches square, projecting 3 inches above the ground. A bronze marker is set in top of monument. The station is known to the authorities of the college. The following true bearings were determined in 1910 and 1919:

East wall of new brick building at college, 1,000 feet away ..	14	29.4	E. of S.
East edge of chimney on same building .....	10	23.0	E. of S.
Center of cement smokestack at asylum for deaf and dumb ..	56	08.0	W. of S.
Northeast edge, under eaves of building at orphanage 300 feet away .....	62	32.2	W. of N.

## MONTANA

*Billings, Yellowstone County.*—The station of 1921 was reoccupied. It is in the eastern part of the cemetery, about 2½ miles west of town. It is in the intersection of the first alley west of the east fence with an alley running east and west, between lots 342 and 343 of the north half of the cemetery and lots 1 and 2 of the south half. It is 38.7 feet from the east fence, 62 feet south-southeast of the southeast corner of the base of the Erickson monument, 54.1 feet northeast of the northeast corner of the base of the Power monument and 44.2 feet north-northeast of the northeast corner of the base of the Trinkle monument. The station is marked by a granite post 6 by 8 by 17 inches, with a bronze disk in the top, set 7 inches below the surface of the ground. The following true bearings were determined:

Courthouse spire, 2½ miles away (mark) .....	65	28.3	E. of N.
Catholic Church spire south of courthouse .....	66	09.5	E. of N.
Center of tall cement stack north of the courthouse .....	61	32.1	E. of N.
Center of large brick stack at sugar factory .....	89	35.7	E. of N.
Extreme vertical edge of cliff several miles away .....	66	48.9	E. of S.

*Browning, Glacier County.*—The station of 1916 was reoccupied. It is located a little to the west of north from cemetery (cemetery is about 2 miles north and west of town), and is 196.4 feet from the base of H. H. Arthur tombstone and 227.1 feet from the base of Therese Keizer tombstone. The station is marked by a sandstone rock, roughly cylindrical, 10 inches long by 5 inches in diameter. The rock is planted about flush with the surface of the ground and has a hole three-fourths of an inch in diameter and three-fourths of an inch deep drilled into it to mark the exact spot. Rocks are piled around marking stone for protection and to assist in finding it. The following true bearings were determined in 1916 and 1925:

Center of railroad water tank (mark) .....	29	16.8	E. of S.
East dormer gable on old Indian school .....	58	47.8	W. of S.
West gable of large Government building in Browning .....	72	53.3	E. of S.
Cross on Catholic Church spire .....	66	09.1	E. of S.
Apex of Mount Divide .....	67	20.2	W. of N.
Apex of city water tank .....	62	42.8	E. of S.

*Chester, Liberty County.*—The station is in a vacant lot in west edge of town, designated in plat of city property as city park. It is about 500 yards nearly due west of the city water tank, on the brow of a slight rise in ground, and about 20 feet north of projected north edge of first east and west street south of city water tank. It is about one-eighth mile nearly north from brick school building and one-half mile nearly west from courthouse. Marked by cement monument buried 20 inches in ground with heavy conical portion projecting about 10 inches above ground and bearing regulation bronze disk in center of top. The following true bearings were determined:

Southeast corner of courthouse, near top.....	65	05.8	E. of N.
Apex of city water tank.....	80	04.1	E. of N.
Northeast edge of school house, level second floor.....	6	16.2	E. of S.
Right one of two conical peaks to northwest—highest point..	29	34.2	W. of N.
Left one of two conical peaks to northwest.....	38	18.2	W. of N.

*Circle, McCone County.*—The station is about one-half mile south of town on the point of a gravelly bluff. There are two main streets running north and south through the center of the town. The station is about midway between the extended lines of above-named streets. The station is marked by a concrete post about 14 inches in diameter and 20 inches long, projecting about 4 inches above ground with a bronze disk in top bearing date 1-9-2-5. The following true bearings were determined:

Center of windmill tower at farmhouse to east.....	55	14.9	E. of S.
Southeast corner of Gladstone Hotel, level second-floor windows.....	32	03.1	E. of N.
Northwest corner of garage building (concrete block), level second floor.....	31	57.1	E. of N.
Peak of belfry on church of United Brethren.....	22	04.1	E. of N.
Southwest corner of cement school building, level second-floor windows.....	17	57.1	E. of N.
Center of house, "Lone Tree" ranch, on horizon to west....	29	37.9	W. of N.

*Conrad, Pondera County.*—The station is about  $1\frac{1}{2}$  miles north of town on the top of a ridge in a field belonging to J. A. L. Bradfield, of La Crosse, Wis. It is reached by the first north and south road west of the railroad tracks as one leaves town. The field is at the place where the road makes a right-angled turn to the west. The station is 29 feet west of the west fence of the lane on the east side of the field and 138.5 feet north of the road fence at the south side of the field, and in line with the fence on the west side of the road. The station is marked by a concrete monument 14 inches in diameter and rounded up to a bronze disk set in the top, which is about 3 inches above the ground. The following true bearings were determined:

Southwest corner of school building.....	10	58.4	W. of S.
Northeast corner of school building.....	10	34.5	W. of S.
Northwest corner of hospital building.....	12	23.0	W. of S.
Mountain peak just visible above tableland to westward....	75	25.3	W. of S.
Point of center of three peaks in Sweet Grass Mountains....	29	53.5	E. of N.

*Cut Bank, Glacier County.*—The station is about 1 mile north from center of town. Most quickly reached by going directly north across fields on a line nearly perpendicular to railroad tracks at depot (slight bearing to west) and away from town. It is about 35 feet from the south side of a deep ravine. On opposite side of this ravine are a number of rocks that appear somewhat like mushrooms. At this point the ravine runs nearly east and west. It is marked by a cement post about 18 inches in ground and 14 inches in diameter, projects about 6 inches above the ground, and bears the regulation bronze station marker in the top. The following true bearings were determined:

Head Light Butte.....	6	51.4	E. of N.
City water tank (peak).....	2	17.4	W. of S.
Catholic Church steeple.....	9	56.6	E. of S.
Highest point in domelike peak—most northerly of range, visible to west tip of railroad water tank—more easterly of two.....	18	59.6	E. of S.



*Glendive, Dawson County.*—The station of 1921 was reoccupied. It is on the east side of the Northern Pacific Hospital grounds, three-fourths mile northeast of the town's center. It is 105.2 feet east of the east corner of the hospital, 125.2 feet southeast of the southeast side of the pumping station, 42 feet west of the fence on the east side of the hedge, and 23.4 feet north of the road leading into the grounds from the east. The station is marked by a round cement post 12 inches in diameter and 30 inches long, projecting a little above the ground and having a bronze disk countersunk in the top. The following true bearings were determined in 1916 and 1925:

Railroad water tank top (steel tank)-----	18	46.0	W. of S.
Flagpole on cupola-----	33	12.2	W. of S.
Flagpole on tower brick schoolhouse 1½ miles away-----	13	25.2	W. of S.
Spire on cupola Dawson High School-----	24	54.0	W. of S.
Center of tall brick smokestack-----	17	58.0	W. of S.

*Hardin, Big Horn County.*—The station is in the southwest part of town, about 1 mile from the business section, on land belonging to the town. It is 299.7 feet west of Miles Avenue and 100 feet north of First Street, measuring from the center of the streets. The station is marked by a cement block about 16 inches in diameter and 20 inches deep, with the top rounding up to a bronze disk, about 3 inches above the ground. The following true bearings were determined:

Tip of city water tank (mark)-----	70	34.4	E. of N.
Tip of cupola on grade-school building-----	65	55.2	E. of N.
Southwest corner of tall chimney at grade school, level with eaves-----	65	37.9	E. of N.
Southwest corner of chimney on new school building-----	18	51.2	E. of N.
Southeast corner of new school building (just below coping)-----	22	28.6	E. of N.

Another cement block with a screw in the center marks the north end of the meridian line. It is on the line of the water plugs on Second Street.

*Harlowton, Wheatland County.*—The station is about 1½ miles southwest of town on land now belonging to Joseph Farnum—a pasture in which is a ridge covered with large boulders. It is about 200 feet southeast from a steep bank along a small creek. It is 65.1 feet southeast of a large boulder on edge of bluff overlooking road, measured from edge of a large basketlike hole in the top of boulder (hole about 18 inches in diameter by 1 foot deep). It is 240 feet south of fence along south side of road (running east and west). Some 500 yards west of this point the road jogs north around a ravine formed by the creek. Station best reached by following a road from depot west past fairgrounds, then take first turn left, cross tracks and take next turn right, following an east-and-west road until it jogs north around the ravine. From this point the rocky ridge may be easily seen by looking back in southeasterly direction. The station is marked by cement post 18 inches or so below surface, about 14 inches in diameter, and projecting above ground about 6 inches. A number of stones were used to make a form for bringing monument above ground. Bronze marker dated 1925 is countersunk in top. The following true bearings were determined:

Left edge of Ford Motor Sales Building (concrete structure)-----	38	12.9	E. of N.
Right edge of brick school building, concrete basement wall-----	46	50.0	E. of N.
Near corner of Montana Flour Mills Co. elevator-----	51	17.9	E. of N.
Left edge of railroad coal-pocket elevator-----	63	27.9	E. of N.
Center stone chimney on stone schoolhouse in northwest edge of town-----	33	33.6	E. of N.

*Hysham, Treasure County.*—The station is in the northwest corner of C. M. Jacob's front lawn, about 1 mile south and a little east of the center of town. It is 50 feet northwest from the northwest corner of the front porch, 15 feet south of the fence along the north side of yard, and 16 feet east of the fence along the west side of yard. It is marked by a cement monument

about 1 foot in diameter by 20 inches deep. The following true bearings were determined:

Highest point of finger rock on peak several miles distant (Sary Butte).....	62	30.2	E. of S.
Peak of silo on farm about $1\frac{1}{2}$ miles away.....	79	29.6	W. of S.
Gable of cupola on elevator facing southeast, located beside railroad.....	37	35.2	W. of N.
Center of spire on city water tank (mark).....	1	05.2	W. of N.
Southwest corner of brick fire-station building.....	1	21.7	W. of N.

*Jordan, Garfield County.*—The station is near the edge of an old cemetery, about three-fourths mile northwest of town, on a slight rise in a southeasterly direction from the cemetery. It is 112 feet from a granite-cross tombstone marking grave of Mary K. Foster, 151 feet from the near corner of the base of Francis Adams tombstone, and about due east from it. The station is marked by a cement post 20 inches long and about 14 inches in diameter, with top rounded up so that bronze marker in center is about 4 inches above level of ground. The following true bearings were determined:

Small cone-shaped peak to west, just under line of horizon...	82	28.3	W. of N.
Southwest corner Grand Hotel.....	73	12.3	E. of S.
West gable on large building on fairgrounds.....	57	52.3	E. of S.
Southwest corner of large cupola on mill.....	71	11.3	E. of S.
Pump rod on windmill on horizon to south (4 to 5 miles)...	11	32.3	E. of S.
South edge of cliff projecting above horizon to west and south of a fair-sized mountain.....	87	05.3	W. of N.
North edge of large rectangular-shaped rock, projecting above horizon to westward.....	88	58.7	W. of S.

*Livingston, Park County.*—The station of 1921 was reoccupied. It is in the grounds of the Protestant Cemetery about 2 miles northwest of town, 45.9 feet south-southeast from the southwest corner of the west cement gate post at the front entrance to the cemetery, and 44.3 feet south-southwest from the southeast corner of the east gatepost. The station was not marked. The following true bearings were determined:

Tip on Kenney obelisk monument 400 feet away (mark)....	7	34.7	E. of S.
Center of windmill (leaning) 400 feet away.....	24	13.9	W. of S.
South gable of small building.....	16	19.8	W. of N.
Center of chimney on house $1\frac{1}{2}$ miles away.....	29	24.3	E. of S.

*Missoula, Missoula County.*—The station is on the grounds of the State University, in the northeast corner of the athletic field, inside of the running track, not far from the station used from 1906 to 1921. It is 30.5 feet from the inside edge of the inside curb around the track, 74.2 feet from the northwest corner of the stone wall along the east side of the track, 57.6 feet from the north end of the last section of inside curb on the straightaway, and 43.1 feet west of the produced line of the inside edge of the inside curb on the west side of the straightaway on the east side of the track. The station is marked by a concrete post 12 inches in diameter and 20 inches long, set flush with the surface of the ground and having a bronze disk in the top. The following true bearings were determined:

Tower on University Hall.....	86	09.3	W. of S.
Northeast corner Natural Science Hall, on brick.....	40	36.9	W. of N.
Steeple of Christian Church (mark).....	25	29.9	W. of N.
South gable of old library.....	71	42.9	W. of N.
Square cupola on brick house, 625 East Front Street.....	24	21.9	W. of N.

*Polson, Lake County.*—The station is about one-half mile southeast of the center of town and about 225 paces south of the northeast corner of the public-school building. It is 8.9 feet north of the prolongation of the line of the north edge of the sidewalk along the north side of F Street, 95.7 feet east of the fence along the west side of the school athletic field, and 109.2 feet southeast from the corner of the cellar wall of the one-story cottage with two chimneys on the north side of F Street. It is marked by a concrete post

about 1 foot in diameter and 20 inches long, set flush with the ground and having a bronze disk in the top. The following true bearings were determined:

Northeast corner of grade-school building (cellar wall near ground) .....	4	38.2	W. of N.
Peak of railroad water tank .....	25	17.0	E. of S.
Tip of pyramid-shaped peak just left of railroad station and beyond hill on other side of station .....	51	20.2	E. of S.
Right edge of brick chimney on brick elevator one-fourth mile away, at roof level .....	66	29.6	W. of S.
Right edge of chimney on courthouse, level with ridge board .....	29	16.1	W. of N.

*Ryegate, Golden Valley County.*—The station is on the north side of town on a line about perpendicular to the railroad tank at the depot and approximately three-fourth mile from the depot. It is located on a high rim or cliff (about 20 feet from its edge), a cliff overlooking the town and river valley. The city water tank, a large concrete structure, is about 440 feet west and a little to the north. The tank is located in the large "rim" and is easily visible from center of town. Station is marked by a concrete post about 14 inches in diameter by about 18 inches long, with about 1 foot below level of ground and with its base set on solid rock. Bronze station marker is set in the top and dated 1925. The following true bearings were determined:

Prominent cliff "rim" to southeast, out edge of overhanging ledge .....	28	29.3	E. of S.
Northwest corner of Currie garage (two-thirds way up) .....	16	21.2	W. of S.
Northwest corner courthouse, level second floor .....	32	47.2	W. of S.
Northwest corner of schoolhouse, level window sills, main floor .....	43	56.2	W. of S.
Right edge of cliff or "rim" on south side of river to southwest .....	80	44.7	W. of S.
Edge of cliff "rim" on right side of river valley at upper corner .....	87	40.7	W. of S.

*Stanford, Judith Basin County.*—The station is on the new courthouse grounds in west edge of town. It is in the southwest corner of the grounds, 36 feet north of fence along the south side of ground, 38.5 feet east of fence on west side, and 289.7 feet about south-southwest from the southwest corner of the new courthouse. The station is marked by a concrete monument about 14 inches in diameter and 20 inches deep, set flush with ground and rounded up on top so that the bronze station marker is about 3 inches above ground. The following true bearings were determined:

Southwest corner brick schoolhouse, second-floor level (mark) .....	16	42.1	E. of S.
Northwest corner of new courthouse, on chimney, level first floor (west edge) .....	17	07.9	E. of N.
Southeast corner new courthouse, level bottom first-floor windows .....	33	48.7	E. of N.
Church spire .....	48	42.1	E. of S.
Northeast corner of schoolhouse, level second floor .....	19	59.1	E. of S.

## NEBRASKA

*Columbus, Platte County.*—The station is situated near the northeast corner of the cemetery, about 1 mile east and one-fourth mile south of the town's center. It is 156.7 feet southwest from the south rail of the Union Pacific Railroad, 156.3 feet west of the cemetery fence, and 38.2 feet northwest from the northwest corner of the Oppliger monument. From the flat-top monument of Ernest Harms measure south 3 feet from south-curb edge and west 2 feet 8 inches from curb edge on east, and stone can be uncovered. The station is marked by a Bedford limestone post, 6 by 6 by 28 inches, covered by 1 or 2 inches of sod, and lettered "U. S. C. & G. S., 1909." The following true bearings were determined:

North edge of gilded ball at base of cross on Catholic Church steeple (mark) .....	56	30.2	W. of N.
North edge of black ball at base of cross on cupola of hospital .....	50	59.0	W. of N.
Northeast corner of top of the H. S. Elliott monument .....	7	11.3	W. of S.

*Chadron, Dawes County.*—The station of 1921 was reoccupied. It is on a bench of the steep hill on the grounds of the normal school about 1 mile due south of town. The curbing on the east side of Main Street, east of the courthouse, is in line with the station, and the walk on the east side of this street would pass 25 feet to the east of the station, if produced. It is 278 feet north from the highest point of the hill, 54 feet northeast from a pine tree. It is marked by a cement post 16 by 16 by 30 inches with a bronze disk in the top, which projects about 2 inches above the ground. The following true bearings were determined in 1915 and 1925:

Left edge of tiptop of large brick stack at normal school	13	15.0	E. of N.
Left edge west ward school	17	36.4	W. of N.
Left edge of north ward schoolhouse	2	02.1	W. of N.
East edge of brick wall of courthouse (northeast corner)	4	24.9	E. of N.
East gable of Mr. Brown's house	81	49.8	W. of S.

*Lincoln, Lancaster County.*—The station of 1915 was reoccupied. It is on the campus of the State University Agricultural School, about 2 miles northeast of the town's center. It is between the roads, about 100 feet northeast of the Home Economics Building. It is marked by a Bedford limestone post, 8 by 8 by 36 inches, with a brass plate in the top. The stone projects about 6 inches above the ground. The laying of additional water pipes and the paving of the driveways since 1915 probably had some effect on the magnetic conditions of the station. The following true bearings were determined from the meridian line in 1921:

Northwest corner of base stone on northwest corner of Home Economics Building	75	41.3	W. of S.
Northeast corner of Plant Industry Building, level with third floor	76	17.8	E. of S.
Southwest corner of Plant Industry Building, level with third floor	29	00.3	E. of S.
Lower tip on stone shield over door to Agricultural Engineer Building	2	46.0	W. of N.

A similar stone, 494 feet to the south, marks the true meridian.

*Newport, Rock County.*—The station of 1921 was reoccupied. It is near the southeast corner of the school grounds, one-fourth mile northwest of the town's center. It is 142.4 feet southeast of the southeast corner of the high school, 79.8 feet east of the cement walk leading to the school, 98.4 feet east of the east side of the annex, 43.1 feet north of the cement walk south of the school grounds, and 21.8 feet from the fence on the east. The station is marked by a cement post, 12 by 12 by 24 inches, with a bronze disk in the top, which sets flush with the ground. The following true bearings were determined in 1915 and 1925:

Apex of railroad water tank one-fourth mile away (mark)	49	50.0	E. of S.
Northeast corner concrete basement wall at ground (new high school)	18	49.5	W. of N.
Southwest corner concrete basement wall (new high school)	46	27.2	W. of N.
Near corner of chimney on house about 150 yards distant, 1 foot from top	48	16.0	E. of N.

#### NEW HAMPSHIRE

*Hanover, Grafton County.*—The station of 1905 was reoccupied. It is on the hillside near the highest and northern part of the golf grounds of the Hanover Country Club near No. 3 putting green. A cherry tree is 72 feet from the station, bearing  $26\frac{1}{2}^{\circ}$  west of north. A pine tree (the northeast one of two adjacent pines) nearly in line with the cherry tree, is 104 feet away. The last elm tree on the south end of the row along the road bears  $56^{\circ} 6'$  east of south. The station is marked by a marble post 6 by 6 by 50 inches, projecting 1 foot above the ground and lettered "U. S. C. & G. S., 1905." The following true bearings have been determined in 1919:

Top of roof on Bartlett stone tower	2	55.2	W. of S.
Wind vane on Dartmouth Hall	9	56.4	W. of S.
Wind vane on college church	17	25.7	W. of S.
Center of last (on north) elm tree along drive, 400 feet away	77	34.4	E. of N.
West gable of barn on Foster place, one-half mile away	53	37.6	E. of S.

## NEW YORK

*Albany, Albany County.*—The station of 1912 was reoccupied. It is on a hill about 400 feet west of the Londonville Road, northwest from Wolfert's Roost Country Club, in a field on the Van Rensselaer estate, in front of an unoccupied farmhouse. The station is not marked, but is 8 feet south from the base of a white marble post 8 by 8 inches, projecting 3 feet above the ground, in the direction of the west tower of the State Capitol. This post is Monument No. 36 of the old Albany city line. The station is 100 feet east of the driveway to the farmhouse. The following true bearings were determined in 1905 and 1919:

West tower tip on Capitol Building (mark).....	12	09.8	W. of S.
Center of tower on large stone building in Troy.....	61	07.2	E. of N.
Center of window in tower on Cleveland residence.....	67	17.0	E. of S.
Spire on St. Joseph's Church.....	0	39.8	W. of S.
Tower of city hall.....	6	20.8	W. of S.

*Ithaca, Tompkins County.*—The station of 1923 was reoccupied, but as it was not likely to be available for future use, a new station was established on the poultry farm of the College of Agriculture of Cornell University, about one-half mile northeast from the astronomical observatory. It is about 30 feet south of the fence along the edge of the woods and nearly in line between the white farmhouse occupied by Arthur Kline, and a pine tree at the southeast corner of the woods, at the side of the road along the back side of the chicken farm. This tree is about 100 paces from the magnetic station. The station is marked by a concrete monument 12 by 12 by 20 inches projecting about 2 inches above the ground, with a bronze disk in the top dated 1925. The following true bearings were determined:

Library tower.....	51	20.4	W. of S.
Middle tower on Risley Hall—women's dormitory.....	68	25.5	W. of S.
Chimney at new agricultural central heating plant.....	15	31.0	W. of S.
Chimney, old agricultural heating plant.....	22	55.7	W. of S.
Tower on Franklin Hall (similar library).....	63	36.5	W. of S.

## NORTH DAKOTA

*Bismarck, Burleigh County.*—The station of 1921 was reoccupied. It is on the south side of the grounds of the county courthouse, in line with the south side of the Methodist Episcopal Church, 14 feet north of the south walk and 93 feet east of the west walk. It is marked by a sandstone post 6 by 6 by 18 inches, with cross and drill hole in the top, set flush with the ground. The following true bearings were determined in 1914 and 1925:

Southeast corner of courthouse (mark).....	36	04.6	E. of N.
Northeast corner of city hall, brick edge.....	48	30.4	E. of S.
Left edge of granite pillar at southeast corner of Methodist Episcopal Church.....	87	45.2	W. of N.
Northeast corner of school building.....	44	03.4	W. of N.
Left edge of entrance to school building, on brick.....	49	36.0	W. of N.

*Jamestown, Stutsman County.*—The station of 1921 was reoccupied. It is on the grounds of the north side public school, near the northeast corner. It is in line with the east side of the school building, and 83.5 feet north of the northeast corner, 109 feet northeast of the northwest corner, 11 feet south of the row of trees on the north edge of the grounds, 28 feet west of the row of trees on the east side of the grounds, and 105 feet east of the row of willows on the west side. The station is marked by a cement post 8 by 8 by 24 inches, projecting 2 inches above the ground, with a bronze disk in the top. The following true bearings were determined in 1914 and 1925:

Left edge of old Presbyterian College, main building (mark).....	82	20.3	E. of S.
Right-handmost edge of large red brick opera house.....	41	51.8	W. of S.
South (left-hand) corner edge of B. P. O. E. Building, one-half mile away.....	40	13.0	W. of S.
Left edge of standpipe 800 feet away.....	11	12.7	E. of N.
Point of south gable on north college building.....	84	54.7	E. of N.
Southeast corner of north college building (above second-floor water table).....	85	33.6	E. of N.

Because of the presence of a temporary building near the old station, observations were also made at an auxiliary station a little more than one city block farther east.

## OKLAHOMA

*Guthrie, Logan County.*—The station of 1911 was reoccupied. It is in the northwestern part of Highland Park, about 1 mile northeast of the business portion of the town, near the tip of the egg-shaped block of residences which projects north from Warner Avenue into the park just west of the main entrance. This piece of land is bounded by a drive with a curb on one side. The magnetic station is about 100 feet north of this curb at the tip, and 67.3 feet south of a drive inside of the park. In the bend of this second drive are three small oak trees, distant from the station 43.8, 55.8, and 64.8 feet, respectively. The station is marked by a limestone post 6 by 6 by 24 inches, about flush with the ground, lettered "U. S. C. & G. S., 1905." The following true bearings were determined in 1906 and 1925:

Cross on Catholic Church-----	54	15.2	W. of S.
East edge of standpipe-----	19	10.1	E. of S.
West edge of standpipe-----	18	49.6	E. of S.
Peak of front gable, Masonic Temple (Scottish Rite)-----	3	43.8	E. of S.
Peak of dome at Masonic Orphanage-----	68	04.8	W. of N.

*Marietta, Love County.*—The station of 1922 was reoccupied. It is located about 1 mile south of the courthouse in A. C. Carter's pasture, which is west of the Santa Fe tracks. It is 654 feet from first rail in track. A line from the station at right angles to the railroad track is about eight poles north of pole No. 432. The station is also about 100 feet south of a small brook. It is marked by a bronze disk set in concrete. The concrete extends about 1 inch above the ground and is about 1 foot square on top. The following true bearings were determined in 1922:

Cupola peak at top of courthouse-----	3	51.4	W. of N.
Apex of water tank-----	1	18.4	W. of N.
East side of water tank (mark)-----	12	05.8	E. of N.
Rod on top of steeple-----	18	10.2	E. of N.
Top of south gable (hip roof) of large house-----	21	19.2	E. of N.

## OREGON

*Pendleton, Umatilla County.*—The station of 1917 was reoccupied. It is one-half mile southeast of the center of the town, on the hill north of the city reservoir. It is 260 feet north of the northwest corner of the reservoir; 240.2 feet northwest of the northeast corner; 106.1 feet east of the row of trees on the west side of the grounds, and 124.2 feet west of the row of trees on the east side. It is marked by a bronze disk set in the top of a concrete post 18 by 18 by 40 inches, projecting 12 inches above ground. The following true bearings were determined in 1917 and 1925:

Center of clock on courthouse-----	36	04.4	W. of N.
South gable of public-school building-----	19	48.2	E. of N.
Block on point of roof of east reservoir-----	19	35.0	E. of S.
Smokestack at asylum-----	84	15.4	W. of N.
Northeast corner of Hotel Pendleton, near top-----	54	56.0	W. of N.

*Portland, Multnomah County.*—Station of 1917 in the city park, 2 miles west of the center of the city, was reoccupied. It is on a steep hillside 180 feet west of the west side of the concrete tennis courts (produced), 200 feet south of a fence marking the north boundary of the park, in line with the southeast and northwest corners of tennis court No. 2, counting from the south, and 140 feet north of the north end of No. 3 (produced). It is marked by a sandstone post 6 by 6 by 14 inches, pyramid top, projecting 3 inches above the ground. The intersection of the edges of the pyramid is the precise spot. The following true bearings were determined in 1917 and 1925:

Apex of watch tower on brick building across canyon-----	27	56.9	E. of S.
Center of high brick tower in city-----	78	26.1	E. of S.
Near corner of large chimney on house just north of tennis courts-----	39	45.4	E. of N.
Most northerly of two towers to north of brick tower (No. 2, above)-----	79	03.6	E. of S.
Northwest corner of Sovereign Hotel, near top-----	77	42.1	E. of S.

## PHILIPPINE ISLANDS

*Alas Bay, Masbate.*—This is one of four stations at which observations were made to develop the local disturbance in the vicinity of Nin Bay. It is on the shore at the northeast entrance to Alas Bay, at the south base of Initong Hill, about 12 feet southeast from a small cave.

*Albay, Luzon.*—Observations were made about 25 feet southeast from the station of 1912, in the northwest corner of the plaza which forms part of the grounds of the Provincial Building. The station was not marked.

*Antabonan Cove, Nin Bay, Masbate.*—This is one of four stations at which observations were made to develop the local disturbance in the vicinity of Nin Bay. It is at the southwest corner of Antabonan Point, at the entrance to Antabonan Cove.

*Aparri, Luzon.*—The station of 1912 was reoccupied. It is the southwestern part of the plaza which extends to the southwest from the Catholic Church. It is 154.3 feet southeast of the southeast corner of the fence surrounding the customhouse, 170.2 feet southwest of the southwest corner of the convent west of the church, 162 feet northeast of the northwest corner of the Aparri Modern Hotel and 141.3 feet southwest from the center of the base of a wooden cross about 50 feet west of the convent. The station is marked by the neck of a dark-glass bottle set about 7 inches below the surface of the ground and surrounded by five other glass bottles set horizontally with their necks against the first. The following true bearings were determined in 1912 and 1925:

Lower northeast corner of customhouse-----	16	00.2	W. of N.
Lower northwest edge of cross on Catholic Church-----	67	50.9	E. of N.
East gable on roof tip of Municipal Building-----	24	35.8	W. of S.
Southeast corner, under caves, of Mission Hospital-----	68	34.8	W. of S.

*Babuyan Island.*—The station is on the north side of the island in the northeastern part of a nearly level space between the two volcanic cones, extending northeast from the west cone. It is about 150 feet a little west of south from the beach and about 56 feet from the west edge of a deep gorge. It is witnessed by three crosses cut in lava rock, one 18 feet to the east, another 25 feet to the northeast and the third 40 feet to the northwest. The station is marked by a cement post made in place, about 9 inches square on top and projecting about 5 inches above ground. The following true bearings were determined:

Triangulation station Rose on northeast point of island-----	55	41.2	E. of N.
Triangulation station Balintang-----	25	36.9	E. of N.
Highest point of a rock in the water off the northeast point of the island-----	49	48.6	E. of N.
Center of rock forming highest point on west volcanic cone--	58	09.3	W. of S.

*Basco, Batanes Islands.*—The station is about 1,000 feet west of the center of town in the southwest corner of the plaza, about 300 feet south of the ruins of the high school and north of a cultivated field. It is 67.5 feet from the northwest wall of this field and 250 feet northeast from its northwest corner. The station is marked by a concrete post, made in place, about 6 inches square on top, projecting about 3 inches above ground and lettered "U. S." on top. The following true bearings were determined:

Lower southwest corner of southwest post supporting upper balcony of Government building-----	70	02.8	E. of N.
Top of outside arch of front door of Catholic Church-----	31	25.8	E. of N.
Bottom of pole at top of wireless tower-----	53	47.1	W. of N.
Lower northeast corner of wireless-telegraph office-----	46	17.1	W. of N.

*Batangas, Luzon.*—The station of 1912 was reoccupied (within a few inches). It is about 1,300 feet west from the center of town, in the northwest corner of the high-school grounds. It is 97.1 feet from the north fence, 92.7 feet from the west fence, 326.6 feet northeast from the northwest corner of the cement foundation of the Agricultural School and 138 feet southwest from the southwest corner of the cement post supporting the southwest pillar of the grand stand. It is marked by the neck of a dark-glass quart bottle buried 1 inch below the surface of the ground. The following true bearings were determined:

West gable point of roof of high school.....	86	21.4	E. of N.
Lower northeast corner of cement foundation of trade school.....	59	10.0	E. of S.
Top of town water tank.....	3	29.9	W. of N.
Northeast corner of cement foundation of Domestic Science Building.....	70	49.0	E. of S.

*Borongan, Samar.*—Observations were taken on the beach on the south side of the river where it enters the bay, about 500 feet southeast from the center of town. There was not time to mark the station.

*Calapan, Mindoro.*—The station of 1912 being no longer suitable for magnetic observations, a new station was established about half a mile southeast from the center of town, in a coconut grove belonging to the St. Agustin family. It is about 173 feet southeast of the house on the property, west of the road running along the beach from the boat landing to the town. It is marked by a cross cut in the top of a flat boulder between the letters "U" and "S." The following true bearings were determined:

Highest point on Verde Mountain.....	37	52.7	W. of N.
Southeast corner, under eaves, of a store across the road with red sheet-iron roof.....	13	06.1	W. of N.

*Camasuru Island, Nin Bay, Masbate.*—This is one of four stations at which observations were made to develop the local disturbance in the vicinity of Nin Bay.

*Cotabato, Mindanao.*—Observations were made in the southeastern part of the school grounds, about 1,000 feet south from the center of town, about 400 feet south of the primary school and on the southeast edge of the baseball grounds. The station was not marked. The southeast gable of the sheet-iron roof of the primary-school building bears 25° 49.5' east of true north.

*Davao, Mindanao.*—The station of 1912 being no longer suitable for magnetic observations, a new station was established about 130 feet to the southwest. It is about one-half mile northwest from the center of town, on a low hill upon which there is a cemetery, west of a road which is the continuation of Magellanes Street. It is 91 feet southwest of a Bureau of Lands monument on the east side of the road, 64 feet southeast of the upper southeast corner of the cemetery wall, and 86 feet southeast of the northeast post of the cemetery gate. It is marked by the neck of a glass bottle buried 3 inches underground. At the side of this bottle is an oval smooth stone 8 inches long with its top over the neck of the bottle and projecting about 2 inches above ground. The following true bearings were determined:

West gable of sheet-iron roof on northwest edge of town.....	36	23.9	E. of S.
Top of northwest wireless tower.....	3	54.1	E. of N.
Northeast edge of sheet-iron building in cemetery, just under eaves.....	70	19.4	W. of N.
North gable of sheet-iron roof.....	83	50.5	E. of N.

*Font Island, Camiguin Island.*—The station is at the southeast corner of Font Island, a short distance from the west coast of Camiguin Island. It is between the beach and a small lagoon, near the north end of the lagoon. It is marked by a cement block about 1 foot square, projecting about 1 inch above ground and lettered "U. S." on top. The following true bearings were determined:

Triangular station Sap on west coast of Camiguin Island near the schoolhouse.....	77	10.4	E. of N.
Highest point of a rock off the next point to the north on Camiguin Island.....	24	29.6	E. of N.



*Ibugos Island, Batanes Islands.*—The station is in the southern part of the island, 86 feet  $7\frac{1}{2}$  inches west of triangulation station Ibugos in prolongation of the line from station Sabtang on Sabtang Island. It is marked by a large rough stone projecting about 2 inches above ground with a bronze magnetic station marker set in the top. This is one of the witness marks of the triangulation station Ibugos. Triangulation station Sabtang bears  $84^{\circ} 37.2'$  east of true south.

*Ligan, Mindanao.*—The station of 1912 was reoccupied. It is in the western part of the field southwest across the road from the town plaza. It is about 200 feet a little north of west from the house of Mr. Jack Cook, 186.3 feet southwest from the southwest corner of the Municipal Building, 45 feet east from the center of the trunk of a monkey pod tree and about 65 feet northeast from the bank of the river. The subsurface mark is the neck of a green glass bottle buried 14 inches below the ground. The surface mark is a rough limestone rock 6 by 8 by 6 inches, projecting about 1 inch above ground and lettered "U. S." The following true bearings were determined:

Lower northwest corner of music stand, near the ground.....	70	13.2	E. of N.
Upper northwest corner of Municipal Building, under eaves.....	36	03.1	E. of N.
Lower southeast corner of Municipal Building.....	53	15.7	E. of N.

*Iloilo, Panay.*—The station is in the northern part of the Constabulary Reservation, about one-half mile east of town and about 300 feet north of the station of 1912. It is in a field between the house of Doctor Soliven, constabulary dentist, on the south, and the constabulary hospital on the north, bounded on the east by the road along the bay. It is 203 feet north of the concrete electric-light pole at the northeast corner of the fence surrounding Doctor Soliven's house, 155 feet east of a small iron telegraph pole, and 225.5 feet southeast of another small iron telegraph pole. The station is marked by a narra wood stake 3 feet long and 3 inches in cross section, which projects about 4 inches above ground. The following true bearings were determined:

Top of steel signal tower on cupola of customhouse.....	75	01.0	W. of N.
Top of tower at southwest corner of Catholic Church.....	79	14.4	W. of N.
Top of dome at north end of Catholic Church.....	77	04.1	W. of N.
Top of southwestern one of two beacons.....	63	14.6	E. of N.
Top of northeastern one of two beacons.....	54	33.2	E. of N.

*Infanta, Luzon.*—The station is about 1,500 feet northwest from the center of town, in the northern part of Catholic Church grounds, back of the church. It is in the eastern one of two rows of concrete supports for wooden posts, which at one time supported a corridor extending north from the church. Observations were taken over the seventh one in the row, counting from the north wall of the ruins of the old church. The station is 81.4 feet from the fence on the southeast side of the grounds and 129.5 feet northeast from the northwest corner of the north wall of the old church. A cross cut near the east edge of the concrete post marks the exact spot over which observations were made. The following true bearings were determined:

Upper southwest corner, under eaves, of house on the north- east corner of Calle Petero and Calle General Luna.....	73	42.6	E. of S.
North gable of roof of house of Dr. V. Dominquez.....	33	39.6	E. of S.

*Jolo, Jolo Island.*—Observations were made in the northeast corner of the parade ground at the Constabulary Barracks, about three-quarters of a mile south of the center of town. The station was not marked. The center of the southeast corner of the barracks bears  $58^{\circ} 48.8'$  west of true south.

*Malan, Nin Bay, Masbate.*—This is one of four stations at which observations were made to develop the local disturbance in the vicinity of Nin Bay. It is identical with triangulation station Malan, on the highest point of Malancanas Hill, on the north shore of Nin Bay. This hill is about  $1\frac{1}{2}$  miles northeast from Mariveles Point, and is 360 feet high. The station is marked by a tile set in the ground and filled with cement.

*Malangas, Mindanao.*—The station is in the northeastern part of the grounds of the Constabulary Barracks, about one-fourth mile northwest of the center of town. It is 40 feet from the northeast fence, 63.4 feet from the northwest fence, and 142.5 feet a little north of east from the constabulary flagpole. The station is marked by a concrete post about 10 inches in diameter at the top,

which is about even with the surface of the ground and is lettered "U. S. C. G." A hole on the northwest side of the top marks the exact spot. The following true bearings were determined:

West gable of E-W building of wireless station-----	86	36.0	E. of S.
South gable of N-S building of wireless station-----	84	40.3	E. of S.
Southwest gable over door of schoolhouse-----	71	29.7	E. of N.
Constabulary flagpole, center of base-----	71	00.3	W. of S.

*Mangal Point, Basilan Island.*—The station is identical with triangulation station Mangal 2, which is about 13 miles southeast from Port Holland. It is about 40 feet north from the beach on the southwest tangent of the point. The station is marked by a concrete post 8 inches square, projecting about 4 inches above ground and lettered "C. & G. S. 1924, Mangal No. 2." It is 25 feet a little south of east from a reference mark of concrete 6 inches square, projecting about 4 inches above ground and lettered "C. & G. S. 1922." The following true bearings were obtained from the triangulation:

Triangulation station Bub-----	22	13.4	E. of S.
Triangulation station End-----	22	28.0	W. of S.

*Mercedes (Port of Daet) Luzon.*—Observations were taken near the beach at Captain Warwick's plantation, about 200 feet northwest from his house and about 1,000 feet northeast from the center of town. The station was not marked.

*New Tolong, Negros.*—Observations were taken on the southeast bank of Bayo Juan River, about three-fourths mile northwest from the center of the pueblo and about one-fourth mile northeast from the point where the river enters the bay. The station was not marked.

*Port San Vicente, Luzon.*—The station is in the northwestern part of the grounds on which stand the wireless-telegraph station and two houses with nipa roofs, a short distance south from Dutton Point. It is about 100 feet from the beach, 167 feet southwest of the southwest corner of one of the houses and 230 feet northwest from the northwest corner of the wireless-telegraph office. The station is marked by a concrete post 12 by 12 by 18 inches, which projects about 2 inches above ground and is lettered "U. S." on top. The following true bearings were determined:

Top of Port San Vicente Beacon-----	63	42.5	W. of N.
Highest point of peak next northeast of Mount Cagua-----	4	37.6	W. of S.
Highest point of second peak to the east of the above peak--	13	54.8	E. of S.

*Surigao, Mindanao.*—Observations were made at a point about 1 foot east of the station of 1912. The old station mark was found when digging to set a new marker. It is in the northern part of the Government lot immediately west of the Provincial Government building, in the northwest part of the town. It is 157.3 feet west from the northwest corner of that building, 88.4 feet east from the west fence of the lot, and 152.9 feet from the south fence. It is marked by a large block of cement about 3 feet in diameter at the top upon which is shaped a raised square 6 by 6 inches lettered "C. & G. S. 1910." This marking stone is about 18 inches below ground. The following true bearings were determined in 1912:

Upper northeast corner of convent, under eaves-----	31	54.0	E. of S.
Extreme northeast corner of sheet-iron roof of band stand---	39	45.0	E. of S.
Lower northwest corner of provincial government building--	85	55.9	E. of S.

*Tacloban, Leyte.*—The station of 1912 being no longer suitable for magnetic observations, a new station was established about one-half mile west from center of town, in the southeast end of the infield within the running track of the provincial athletic field. It is 92 feet northwest from the fence outside the track, 42 feet south from the south corner of the rectangular basket-ball court, 175 feet northeast from the northeast corner of the small stand southeast of the grand stand and 63 feet southwest from the southwest post at the southeast end of the basket-ball court. The station is marked by a narra wood

stake 3 feet long and 3 inches in cross section, which projects 4 inches above ground. The following true bearings were determined:

Lower northeast corner of Domestic Science Building-----	55	09.2	W. of N.
Southeast gable of the auditorium-----	66	04.0	W. of N.
Northeast gable of roof of Academic Building-----	46	54.2	W. of N.
West gable of roof of main high-school building-----	66	24.3	E. of S.
Top of concrete distance post on the northwest side of the running track-----	69	22.0	W. of N.

*Tandag, Mindanao.*—The station is about 1,500 feet east from the center of town in the east corner of the schoolhouse grounds. It is about 230 feet southeast from the schoolhouse, 59.8 feet from the northeast fence, and 57.0 feet from the southeast fence. It is marked by an iron-wood stake 40 inches long and 4 inches in diameter which projects about 9 inches above ground. The following true bearings were determined:

Southeast gable of the iron roof of the schoolhouse-----	73	30.6	W. of N.
Lower northeast corner of schoolhouse-----	51	32.5	W. of N.
Northeast gable of the iron roof of the schoolhouse-----	55	33.7	W. of N.

*Vigan, Luzon.*—The station of 1912 was reoccupied. It is about three-fourths mile southwest of the center of town on a low ridge of hills about 2,000 feet southwest from the old Vigan Cemetery. The road runs south between the ridge and another small cemetery about 1,200 feet northwest from the station and at this place makes a curve to the east around the ridge. The station is on the top of the ridge, 64 feet west of the highest point, 128 feet from the center of the road to the south, about 147 feet from the center of the road to the west, and 29.7 feet almost due north from the center of a small lone tree about 3 inches in diameter. The station is marked by a granite stone 3 by 15 by 15 inches, set flush with the ground. The following true bearings were determined in 1912 and 1925:

Top of bell tower of Bantay Church-----	23	47.0	E. of N.
Spire of bell tower of Vigan Church-----	25	07.9	E. of N.
Center of statue on rear dome of chapel in Vigan Cemetery--	19	53.6	E. of N.
Upper east edge of water tower-----	13	10.8	W. of N.

*Zamboanga, Mindanao.*—The station of 1911 was reoccupied. It is identical with the triangulation station Santa Cruz, near the beach on the northeast side of Santa Cruz Island and almost in the center of this northeast side. It is marked by a cement monument 5 by 5 by 24 inches set in cement, projecting 5 inches above the ground, and lettered "U. S. C. S." on top. The following true bearings have been determined:

Lighthouse-----	60	52.1	W. of N.
Flagstaff on cupola of Municipal Building-----	20	11.6	E. of N.
Top of wireless-telegraph tower-----	28	30.2	W. of N.

#### RHODE ISLAND

*Kingston, Washington County.*—The station of 1910 was reoccupied. It is on the grounds of the Rhode Island Agricultural College, on the open square south of Lippitt Hall. It is southwest of the intersection of the two concrete walks in the campus, 2.5 feet south of the near edge of the east and west walk, and 17.8 feet west of the north and south walk. It is 236.3 feet east of the northeast corner of the dormitory, and 175 feet southwest of the flagpole. The station is marked by a marble post 10 by 10 by 30 inches, set about 2 inches below the level of the ground, and lettered "U. S. C. S." A one-half inch hole in the center marks the exact spot. The following true bearings have been determined:

Center of keystone over door of Science Hall-----	1	42.0	E. of S.
Hole in meridian stone 290 feet away-----	0	03.0	W. of S.
Lightning rod on boarding hall-----	66	33.0	W. of S.
Cap on north tower on Davis Hall-----	82	51.6	W. of N.
Tip on silo at dairy barn-----	19	02.0	W. of N.

*Providence, Providence County.*—The station of 1910 was reoccupied. It is on city property on the grounds of the Sockanosset Reservoir, about 5 miles (air line) southwest of city hall. It is in a pasture south of the center of the reservoir, about 125 yards west from a house where the gatekeeper lives, and about 120 yards from the nearest wall of the reservoir. It is 36.4 feet from a wire fence on the north side and 47.1 feet due east of an oak tree. It is also 61.3 feet due west of an ash tree. A second stone marking a meridian line was set 251.7 feet due south of the station. This stone is 18.1 feet north-east of an ash tree and 88.7 feet from the south wall of a pasture. The stones are each 4 feet long, 12 inches square at bottom, and 6 inches square at top, set flush with the ground, and lettered "U. S. C. S." A small hole  $1\frac{1}{2}$  inches deep marks the exact spot. The following true bearings were determined in 1910 and 1925:

Tower on main hall at Rhode Island School for Boys (mark).....	37	53.7	E. of S.
Center of stone over door at gatehouse, 200 feet away.....	18	27.6	E. of N.
Chapel tower tip at Sockanosset School.....	48	51.3	E. of S.
Tip of water tank about 1,000 yards away.....	9	28.4	W. of S.
Tip of tower on factory.....	60	36.1	E. of S.

## TEXAS

*Wichita Falls, Wichita County.*—The station of 1914 was reoccupied. It is in the cemetery about 1 mile west of the town. It is just north of the second of the main cross drives, and in the middle of the fourth 10-foot driveway east of the entrance driveway. It is 32.5 feet from the middle of the cross driveway and 5.5 feet from the northeast corner of the Fleming lot. The station is marked by a limestone post 5 by 7 by 35 inches, with a brass magnetic station mark set in the top. The top of the stone is 2 inches above the surface. The following true bearings were determined in 1914 and 1925:

Top of tower of building of Academy of Mary Immaculate.....	42	26.8	E. of S.
East edge of Wichita Mill & Elevator Co. building.....	49	28.0	E. of S.
Northwest corner of wall, Wichita Falls General Hospital.....	25	46.5	E. of S.
Southwest corner of First Baptist Church, below coping.....	71	18.7	E. of S.
East edge of smokestack of Wichita Mill & Elevator Co. (building roof level).....	50	06.8	E. of S.

The south meridian stone is 3 feet north of the northeast corner of the chapel which is near the entrance on the south side of the cemetery. The stone is 5 by 7 by 18 inches, projects 1 inch above the ground, and has a cross cut in the top.

## VERMONT

*Burlington, Chittenden County.*—The station of 1898 was reoccupied. It is the south end of the meridian line on the campus of the University of Vermont, in the rear of the buildings. It is marked by a granite post and is about 230 feet east from the northeast corner of the brick baseball cage back of the gymnasium, about 62 feet southwest from a small lone fir tree and about 130 feet south from the center of the path to the northeast. The north stone is about 300 feet southeast of the southeast corner of the Engineering Building and is 719.3 feet from the magnetic station and projects about 6 inches above the ground. The following true bearings were determined in 1910 and 1919:

Rod on cupola of college barn.....	35	34.7	E. of S.
Cupola tip on barn 600 feet away.....	30	00.2	W. of S.
Northeast corner of granite base of Williams Science Hall.....	52	15.1	W. of N.
Center of concrete transit base near southeast corner of En- gineering Building.....	17	22.3	W. of N.

*Rutland, Rutland County.*—The station of 1905 was reoccupied. It is on land of the city home for the poor, about  $1\frac{1}{2}$  miles east of the center of town. It is just south of the abandoned little graveyard on the hill east of the buildings. From the station northwest to the southwest corner of the graveyard fence is 47.9 feet; northeast to the southeast fence corner is 72 feet. The

station is marked by a large, natural, white sandstone rock which protrudes above ground and is lettered "U. S., 1905." The following true bearings were determined in 1910 and 1925:

Highest east gable of city poorhouse-----	58	02.8	W. of S.
North gable of large red barn one-half mile away-----	28	31.6	W. of S.
North gable of barn three-fourths mile away-----	7	09.6	W. of S.
West gable of white farmhouse-----	80	12.2	E. of S.
Top of tower at southwest corner of a large red barn-----	86	37.7	W. of N.

*St. Johnsbury, Caledonia County.*—The station of 1905 was reoccupied. It is in a pasture belonging to the E. & T. Fairbanks Co., on a sand hill south of the village and immediately south of the house and yard now (1919) owned by P. P. Alles. The flint of a small tower on Mr. Fairbanks's house and the spire of St. Aloysius Church are in range with the station. To the corner of the fence around Mr. Alles's yard is 145 feet, bearing 8° 51' east of north. The station is marked by a marble post 5 by 5 by 36 inches, projecting 1 inch above ground and lettered "U. S. C. & G. S., 1905." The following true bearings were determined in 1910 and 1919:

Center of tower windows on Fairbanks house 600 feet away (mark)-----	7	35.4	E. of N.
West gable of Flanigan house 1½ miles away-----	26	45.6	E. of N.
Flint of tower on Gouthier's right-hand house, across river three-fourths mile away-----	36	05.5	E. of N.
Tower on Gibbon's house one-half mile away-----	58	08.6	E. of N.
Tower on little school house 1¾ miles away-----	48	34.0	W. of N.

#### WASHINGTON

*Olympia, Thurston County.*—The old station being no longer available, a new station was established about 250 feet farther north, on the south side of an undeveloped street (Leavenworth Street). It is 10.3 feet from a stake marking the south side of the street, in line with stakes marking the east edge of a 10-foot alley running in a north-and-south direction along the rim of the hill, which makes a steep descent to East Bay Drive. The station is marked by a sandstone post, 7 by 9 inches, projecting about 6 inches above the ground, and having a bronze disk in the top. The following true bearings were determined:

Peak of city steel water-pressure tank on ridge across sound-----	65	31.8	W. of S.
Peak of water tank at sawmill in middle of sound-----	46	42.8	W. of S.
Spire on old statehouse-----	23	55.8	W. of S.
Apex of east gable on new statehouse-----	23	47.8	W. of S.
West gable of small cottage-----	84	33.2	E. of S.

*Seattle, King County.*—The station of 1921 was reoccupied. It is in Seward Park, near the west shore of Bailey Peninsula and at the head of Andrews Bay. It is in a little-used path along the top of the bluff, about 7 feet from the edge of the bluff and about 20 feet down the bank toward the lake from a road. The crest of the bathhouse roof bears S. 52° W., and is about 60 yards away. The station is marked by a concrete post with a bronze disk in the top, set flush with the surface of the ground. The following true bearings were determined in 1921 and 1925:

South dome of Church of Immaculate Conception-----	31	08.4	W. of N.
North dome of Church of Immaculate Conception-----	31	08.9	W. of N.
South gable of house on top of hill across the bay-----	58	48.0	W. of N.
East gable of house across the bay having brick pillars at front of drive entrance-----	66	05.7	W. of N.
Tip of large dome on horizon-----	23	23.1	W. of N.

*Spokane, Spokane County.*—The station of 1917 was reoccupied. It is on an unused portion of ground in the northwest part of Fairmount Cemetery and 315.6 feet from the board fence bounding the cemetery on the north. The station is marked by a sandstone post 4 by 6 by 26 inches, projecting about a foot above the surface of the ground. (Rocks prevented post being planted

deeper). The post is lettered on top "U. S. C. & G. S. 1906," and has a hole in the center to mark the exact spot. The following true bearings were determined in 1906 and 1917:

Tip on water tank.....	6	15.3	W. of S.
Right edge of water tank.....	6	49.1	W. of S.
South edge of top of brick smokestack at old smelter.....	45	38.9	W. of N.
North edge of top of brick smokestack at old smelter.....	45	13.2	W. of N.

## WYOMING

*Gillette, Campbell County.*—The station of 1905 being no longer suitable for magnetic observations, a new station was established on grounds supposed to belong to the high school, and about one-fourth mile south-southeast of the same. It is on a high section of ground, about 30 feet east of the ravine bank, 12 paces from the south line fence of these grounds, and 60 paces west from the line fence between these grounds and the cemetery. The station is marked by a concrete post about 1 foot square by 18 inches deep set flush with ground surface. The following true bearings were determined:

East side of body of steel railroad water tank.....	33	58.1	E. of N.
Tip of water tank along railroad west of steel tank (mark).....	12	26.1	E. of N.
Southeast corner of chimney on high-school building.....	4	32.1	E. of N.
Tip of water tank on hill.....	64	52.1	W. of S.
Eastern tip edge of Antelope Butte.....	1	25.0	W. of S.

*Sheridan, Sheridan County.*—The station of 1905 was reoccupied. It is on the grounds of the Veterans' Bureau Rehabilitation Hospital No. 86, 602 feet nearly south of Building No. 40, about 100 feet south of the old main drive entering the grounds, and a little to the west of the point of junction with the road to the supply warehouse. The eastern corner of building No. 40 appears in line with the gable of building No. 41, and the southwesterly corner of building No. 4 is in line with the center of building No. 27. The station is marked by a sandstone post 7 by 7 by 27 inches, projecting 4 inches above the ground and lettered "U. S. C. & G. S., 1905." The following true bearings were determined in 1910 and 1925:

Brick stack at Chicago, Burlington & Quincy Railroad round-house.....	58	23.0	E. of S.
Center of tall concrete smokestack.....	35	11.4	E. of S.
Nearest corner of chimney on school building.....	40	13.2	E. of S.
Nearest corner of nearest chimney on Red Cross and gymnasium building.....	61	24.2	W. of N.
Gable at south end of old commissary building.....	4	02.8	E. of N.

## FOREIGN COUNTRIES

*Battle Harbor, Labrador.*—Station C established by the department of terrestrial magnetism of the Carnegie Institute of Washington in 1905 was reoccupied. It is in a hollow extending northwest and southeast near the center of Battle Island. It is about 500 feet east of an English church, about the same distance north of the wireless station and about 15 feet east of a natural step in a rock about 2 feet high. The station is marked by a shallow hole drilled in the rock, surrounded by three shallow holes where the tripod legs stood. The following true bearings were determined in 1905:

Tower of Double Island Light.....	41	23.1	E. of S.
North gable of wireless station.....	23	07.0	E. of S.

*Etah Harbor, North Greenland.*—The station established by the department of terrestrial magnetism of the Carnegie Institution of Washington was reoccupied. It is about 400 feet from the extreme end of Reindeer Point, almost directly north of the coal depot. The point is nearly inclosed by a ledge of rocks, and the station is near the northwest corner of the inclosure. The distance to the bottom of a very precipitous rock in the ledge almost north of the station is 55.4 feet, and to the bottom of a vertical stratum of rock in the ledge west of the station is 97.8 feet. The station is marked by a pile

of rocks, under which was placed a U. S. Coast and Geodetic Survey flag and a record wrapped in balloon fabric. The crotch in the mountain just as it slopes down to Brother Johns Glacier bears  $76^{\circ} 31.3'$  east of true south.

*Godthaab, South Greenland.*—The station established by the department of terrestrial magnetism of the Carnegie Institution of Washington was reoccupied. It is on a small island in the northern arm of the inner harbor, near the center and at about the highest level of the island, within a few feet of the spot where Capt. F. L. McClintock, Royal Navy H. M. S. *Bulldog*, made observations in 1860. The station is marked by a tent peg driven nearly flush with the ground, with a rock cairn erected over it.

*Holstenborg, South Greenland.*—The station established by the department of terrestrial magnetism of the Carnegie Institution of Washington was reoccupied. It is a little to the north of the village, on the southern side of the mouth of the fjord. It is on a small patch of level ground, 112 feet from the northeast corner of a small stone powder magazine painted white and 73 feet from a wood-frame triangle painted red, which is the front range of a pair of anchorage ranges. The station is marked by a tent peg driven nearly flush with the ground, with a rock cairn erected over it.

*Hopedale, Labrador.*—Station B of the department of terrestrial magnetism of the Carnegie Institution of Washington was reoccupied. It is on a point of land about 200 yards east of the Moravian Mission and within a few feet of the highest point of the exposed rock. Three 1-inch holes about 1 inch deep were drilled in the ledge of rock for the tripod legs to set in and a number of boulders were piled in the form of a cairn to mark the spot. The position of the station is known to the officials at the mission. The following true bearings were determined at the time the station was established:

Base of pole west of mission.....	85	15.8	W. of N.
Pinnacle of Moravian Church.....	75	36.1	W. of N.
Beacon on hill .....	43	39.5	W. of N.

*Igloo de Houny, North Greenland.*—On landing at this settlement in Robertson Bay the first thing that strikes one is the beautiful sand beach. At the eastern end of the beach is a small stream. Follow the east bank of this stream about 30 paces and there will be found a cairn of rocks which covers the tent peg which marks the magnetic station. The cairn is about 34 feet northwest from the northwest corner of a ruined frame house said to have been used by the Danish scientist Kock, the only house on the east side of the stream.

*Sukertoppin, South Greenland.*—The station is on the west side of the harbor, on a grassy spot among the rocks, at the foot of a rocky cliff about 10 feet high. On top of the ledge above the station there is a red triangular range signal made of wood. The shore at this point has a small indentation, affording a landing place for a small boat. The station is marked with a tent peg covered with a pile of rocks.

*Sydney, Nova Scotia.*—The station established by the department of terrestrial magnetism of the Carnegie Institution of Washington was reoccupied. It is on the highest point of ground in the western part of Victoria Park, northwest of the business section of town and about 1 mile from the iron foundries. It is about 94 paces south of a wooden signal tower. The station is marked by a round peg about 1 inch in diameter and 18 inches long driven flush with the ground. The spire of Sacred Heart Catholic Church bears  $54^{\circ} 06'$  east of true south.