

REPORT OF THE SUPERINTENDENT

OF THE

U. S. COAST AND GEODETIC SURVEY

SHOWING

THE PROGRESS OF THE WORK

DURING THE

FISCAL YEAR ENDING WITH

JUNE, 1885.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1886.

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APPENDIX No. 1.

Distribution of the parties of the Coast and Geodetic Survey upon the Atlantic, Gulf of Mexico, and Pacific coasts, and in the interior of the United States during the fiscal year ending with June 30, 1881.

Sections.	Parties.	Operations.	Persons conducting operations.	Localities of work.
SECTION I. Maine, New Hampshire, Vermont, Massachusetts, and Rhode Island, including coast and seaports, bays and rivers.	No. 1	Topography	Charles H. Boyd, assistant; Henry R. Taylor.	Machias Bay entrance, Machiasport and coast to the eastward.
	2	Topography	Eugene Ellicott, assistant; J. H. Turner, aid.	Chandler's Bay and Englishman's Bay shore-lines, coast of Maine. (See also Sections III and VI.)
	3	Hydrography	Lieut. E. D. F. Heald, U. S. N., assistant; Ensigns T. D. Griffin, A. Jeffries, and W. C. Canfield, U. S. N.	Narragansett River, Harrington River, and Pleasant Bay and river, Maine. (See also Sections VI and VIII.)
	4	Topography	A. W. Longfellow, assistant, E. F. Dickins, assistant.	Prospect Harbor and Mount Desert Island, Maine.
	5	Tidal observations	J. G. Spaulding	Record of observations with self-registering tide-gauge continued, and meteorological observations recorded at Pulpit Cove, North Haven Island, Penobscot Bay.
	6	Hydrographic examinations.	Lieut. J. E. Pillsbury, U. S. N., assistant.	Coasts of Maine, New Hampshire, and Massachusetts. (See also Section VI.)
	7	Geodetic operations.	Prof. E. T. Quimby, acting assistant.	Continuation of the triangulation of the State of New Hampshire.
	8	Geodetic operations.	Prof. V. G. Barbour, acting assistant.	Occupation of stations in continuation of the triangulation of the State of Vermont.
	9	Special triangulation.	Henry L. Whiting, assistant, and commissioner for the State of Massachusetts; Gershom Bradford, assistant; F. W. Perkins, assistant; C. H. Van Orden, subassistant.	Trigonometrical operations in aid of a topographical survey of the State of Massachusetts.
	10	Hydrographic examinations.	Lieut. Commander W. H. Brownson, U. S. N., assistant; Lieut. F. H. Crosby, U. S. N.; Ensigns P. J. Werlich, William Truxtun, E. Simpson, jr. and M. C. Goff, U. S. N.	Coasts of Massachusetts and Rhode Island (See also Section II.)
	11	Magnetic observations.	James B. Baylor, subassistant.	Magnetic stations at Providence and on Coasters Harbor Island. (See also Section II.)
	12	Hydrographic examinations.	Ensign A. F. Fechteler, U. S. N., assistant; Ensigns F. W. Kellogg, and F. R. Brainard, U. S. N.	In the approaches to Newport, R. I. (See also Sections II and III.)
	13	Tidal observations		Observations continued at Providence, R. I., with a self-registering tide-gauge loaned to the city engineer.

APPENDIX No. 1—Continued.

Sections.	Parties.	Operations.	Persons conducting operations.	Localities of work.
SECTION II.				
Connecticut, New York, New Jersey, Pennsylvania, and Delaware, including coast, bays, and rivers.	No. 1	Topography	Charles Hosmer, assistant; W. I. Vinal, subassistant.	Topographical resurvey of the northeastern coast of Long Island in the vicinity of Gardiner's Bay, Shelter Island, and Greenport; also of the north shore of the Sound from Darien, Conn., northward.
	2	Topography	W. I. Vinal, subassistant.	Continuation of the topographical resurvey of the north shore of Long Island to the west of Greenport.
	3	Hydrographic examinations.	Ensign A. F. Fichteler, U. S. N., assistant; Ensigns F. W. Kellogg and F. R. Brainard, U. S. N.	Hydrographic work off Terry Point and Rocky and Horton's Points, Long Island. (See also Sections I and III.)
	4	Topography	W. C. Hodgkins, subassistant.	Topographical resurveys at the mouth of the Connecticut River, and near Milford and Stratford, on the north shore of Long Island Sound; also from Lloyd's Neck eastward, on the south shore.
	5	Topography	W. H. Dennis, assistant; C. H. Van Orden, subassistant; J. W. Dudley, acting aid.	Continuation of the topographical resurvey of the north shore of Long Island Sound in the vicinity of Madison, Guilford, and Branford, Conn.
	6	Hydrography	Lieut. W. G. Cutler, U. S. N., assistant; Ensigns F. H. Sherman and J. S. Watters, U. S. N.	Inshore hydrographic survey of the northern coast of Long Island Sound from Hammonasset Point to Welch's Point.
	7	Tidal observations		Tidal observations with an automatic gauge at the light-house on the New-Haven Breakwater.
	8	Topography	E. Hergesheimer, assistant.	Continuation of the topographic resurvey of the north shore of Long Island Sound from Frost (or Farms) Point westward. Topographical resurvey of shores of East River.
	9	Triangulation	Gershom Bradford, assistant.	Triangulation in the western part of Long Island Sound extended from Lloyd's Neck towards New Rochelle. (See also Section I.)
	10	Topography	Charles Hosmer, assistant.	Topographical resurvey of the north shore of Long Island Sound continued from Darien, Conn., towards New Rochelle, N. Y.
	11	Topography	E. Hergesheimer, assistant.	Topographical resurvey of the shores of East River, New York.
	12	Hydrography	Lieut. J. M. Hawley, U. S. N., assistant.	Hydrographic resurvey of the East River, New York.
	13	Triangulation	E. F. Dickins, assistant.	Determination of points for the resurvey of New York Lower Bay.
	14	Topography	J. Hergesheimer, assistant.	Topographic resurvey of the shore lines of Coney Island and Rockaway Beach, New York Lower Bay. (See also Section VI.)
	15	Hydrography	Lieut. G. C. Hannus, U. S. N., assistant.	Hydrographic resurvey of the entrance to New York Bay. (See also Sections V and VI.)
	16	Topography	D. B. Wainwright, assistant.	Topographic resurvey of the shores of the North River, New York. (See also Section III.)
	17	Hydrography	Lieut. W. G. Cutler, U. S. N., assistant.	Hydrographic resurvey of the North River, New York.
	18	Physical hydrography.	Henry Mitchell, assistant; H. L. Marindin, assistant; Marcus Baker, assistant.	Development of plans for the study of the physical hydrography of New York Bay and Harbor.
	19	Tidal observations		Records of observations with self-registering tide-gauges at Governor's Island and at Sandy Hook.
	20	Topography	E. L. Taney, aid.	Topographical resurvey of Sandy Hook.
	21	Geodetic operations.	Prof. E. A. Bowser, acting assistant.	Extension of reconnaissance and triangulation in the southern part of the State of New Jersey.
	22	Geodetic operations.	Prof. Mansfield Merriman, acting assistant; O. H. Tittmann, assistant.	Extension of reconnaissance and triangulation in the eastern half of the State of Pennsylvania.

APPENDIX No. 1—Continued.

Sections.	Parties.	Operations.	Persons conducting operations.	Localities of work.
SECTION II—Continued.				
No. 23	Geodetic operations.	Prof. L. H. Barnard, acting assistant.		Reconnaissance for triangulation in the western half of the State of Pennsylvania.
24	Triangulation	Spencer C. McCorkle, assistant; C. H. Sinclair, assistant; C. H. Van Orden, subassistant.		Special triangulation for the city of Philadelphia.
25	Physical hydrography.	Henry Mitchell, assistant; Henry L. Marindin, assistant.		Physical hydrography of Delaware River and Bay.
26	Triangulation	F. W. Perkins, assistant; C. H. Van Orden, subassistant.		Special triangulation. Delaware River, from Petty's Island to Poquessink Creek. (See also Section VIII.)
27	Magnetic observations.	Edwin Smith, assistant.		Magnetic observations at Philadelphia. (See also Sections VIII, IX, and XV.)
28	Hydrographic examinations.	Lieut. Commander W. H. Brownson, U. S. N., assistant; Ensign M. C. Gorgas, U. S. N.		Determination of position of wreck off Barneget. (See also Section I.)
29	Triangulation, reconnaissance, and magnetic observations. Continuation of topographic survey.	C. M. Bache, assistant; J. B. Baylor, subassistant.		Continuation of triangulation and reconnaissance on the New Jersey coast. Magnetic station occupied on that coast, and topographic survey continued.
30	Topography	R. M. Bache, assistant; E. L. Taney, aid.		Topographical resurvey of the New Jersey shore of Delaware Bay continued.
31	Topography	C. T. Iardella, assistant.		Completion of the topographical resurvey of the western shore of Delaware Bay.
32	Hydrography	Lieut. G. C. Hannus, U. S. N., assistant; Ensigns A. L. Hall, J. H. Hetherington, E. F. Leiper, and G. R. French, U. S. N.		Continuation of the hydrographic resurvey of Delaware entrance. (See also Sections V and VI.)
SECTION III.				
Maryland, District of Columbia, Virginia, and West Virginia, including bays, seaports, and rivers.				
No. 1	Determinations of gravity.	C. S. Peirce, assistant; F. H. Parsons, subassistant.		Gravity determinations and experimental researches at Washington, D. C., and in Virginia. (See also Section VI.)
2	Magnetic observations.	Charles A. Schott, assistant.		Annual determination of the magnetic declination, dip and intensity at a station on Capitol Hill, Washington.
3	Topography	John W. Donn, assistant; D. B. Wainwright, assistant.		Continuation of the detailed topographical survey of the District of Columbia.
4	Geodesic leveling.	John B. Weir, assistant; John Nelson, aid.		Lines of leveling of precision carried from Ashland, Va., to Fortress Monroe. (See also Section XIV.)
5	Special survey.	Charles Junken, acting assistant.		Determination of points on the boundary line between Maryland and Virginia.
6	Hydrographic examinations.	Ensign A. F. Fichteler, U. S. N., assistant.		Hydrographic examinations off Cape Henry, Va. (See also Sections I and II.)
7	Topography	Eugene Ellicott, assistant.		Supplementary topographical survey between Norfolk and the ocean shore. (See also Sections I and VI.)
8	Reconnaissance and triangulation.	A. T. Mosman, assistant; F. D. Granger, assistant; Prof. J. H. Gore, volunteer assistant; W. B. Fairchild, extra observer; J. E. McGrath, aid.		Extension of the primary triangulation near the thirty-ninth parallel from West Virginia into Kentucky and Ohio.
SECTION V.				
South Carolina and Georgia, including coast, sea-water channels, sounds, harbors and rivers.				
No. 1	Hydrography	Lieut. G. C. Hannus, U. S. N., assistant; Ensigns E. F. Leiper, F. R. Brainard and George R. French, U. S. N.		Hydrographic survey in Stone and Wadmelaw Rivers, South Carolina. (See also Sections II and VI.)

UNITED STATES COAST AND GEODETIC SURVEY.

APPENDIX No. 1—Continued.

Sections.	Parties.	Operations.	Persons conducting operations.	Localities of work.
SECTION VI.				
Peninsula of Florida, from Saint Mary's River, on the east coast, to and including the Anclote Keys on the west coast, with the coast approaches, reefs, keys, seaports and rivers.	No. 1	Triangulation and topography.	Eugene Ellicott, assistant.	Triangulation and shore-line topography of Saint John's River from Palatka to Nine-mile Point. (See also Sections I and III.)
	2	Hydrography.	Lieut. G. C. Hannus, U. S. N., assistant; Ensign E. F. Leiper, U. S. N., assistant; Ensigns F. R. Brainard and G. R. French, U. S. N.	Hydrographic survey of Saint John's River from Racy Point to Palatka. (See also Sections II and V.)
	3	Physical hydrography.	Lieut. J. E. Pillsbury, U. S. N., assistant; Ensigns A. F. Fichte-ler, P. J. Werlich, W. A. Thom, William Truxtun, E. Simpson, and M. C. Gorgas, U. S. N.	Deep sea soundings in N. W. Providence Channel, and in Gulf Stream off Florida coast, and subcurrent observations in Gulf Stream between Fowey Rocks and Gun Cay, Bahamas. (See also Section I.)
	4	Determination of gravity.	C. S. Peirce, assistant; W. B. Fairfield, extra observer.	Determination of gravity at Key West. (See also Section III.)
	5	Beach measure and topography.	Joseph Hergeshelmer, assistant; J. H. Turner, aid.	Beach measure and topography on west coast of Florida from Bowditch Point to Cape Romano. (See also Section II.)
	6	Hydrography.	Lieut. E. D. F. Heald, U. S. N., assistant; Ensigns T. D. Griffin, J. M. Orchard, A. Jeffries, W. C. Canfield, and J. E. Craven, U. S. N.	Hydrographic survey of the west coast of Florida from the vicinity of Gordon's Pass to Cape Romano. (See also Sections I and VIII.)
SECTION VIII.				
Alabama, Mississippi, Louisiana, and Arkansas, including Gulf coasts, ports, and rivers.	No. 1	Reconnaissance.	O. H. Tittmann, assistant; George F. Bird, aid.	Continuation of reconnaissance for the connection of the triangulation of the Gulf coast with that along the Blue Ridge. (See also Section II.)
	2	Hydrography.	Lieut. E. D. F. Heald, U. S. N., assistant; Ensigns T. D. Griffin, J. M. Orchard, A. Jeffries, W. C. Canfield, and J. E. Craven, U. S. N.	Hydrographic work in Mobile Bay and around the Chandeleur Islands. (See also Sections I and VI.)
	3	Telegraphic longitudes.	Edwin Smith, assistant; C. H. Sinclair, assistant; E. D. Preston, subassistant.	Determination of the longitudes of Little Rock, Texarkana, and Fort Smith, Arkansas. (See also Sections IX, XV, and XVI.)
	4	Triangulation and topography.	F. W. Perkins, assistant; E. L. Taney, aid; Richard C. Wilson, volunteer aid.	Triangulation and topography of the coast of Louisiana from Côté Blanche Bay to the westward. (See also Section I.)
	5	Hydrography.	Lieut. F. H. Crosby, U. S. N., assistant; Ensigns T. M. Bramby, A. L. Hall, J. H. Hetherington, and J. S. Watters, U. S. N.	Hydrographic survey off the coast of Louisiana from Sabine Pass eastward.
SECTION IX.				
Texas and Indian Territory, including Gulf coast, bays, and rivers.	No. 1	Telegraphic longitudes.	Edwin Smith, assistant; E. D. Preston, subassistant.	Determination of the longitude of Brownsville Texas. (See also Sections VIII, XV, and XVI.)
	2	Triangulation.	R. E. Halter, assistant.	Triangulation and wire-measurement between Point Isabel and Brownsville, Texas.
SECTION X.				
California, including the coast, bays, harbors, and rivers.	No. 1	Triangulation.	A. F. Rodgers, assistant.	Survey of the coast-line, connecting the work at San Juan Capistrano with that at Newport Bay.
	2	Magnetic observations.	Marcus Baker, assistant; Carlisle Terry, jr., aid.	Series of observations continued at the magnetic self-registering record station at Los Angeles, Cal.

UNITED STATES COAST AND GEODETIC SURVEY.

APPENDIX No. 1—Continued.

Sections.	Parties.	Operations.	Persons conducting operations.	Localities of work.
SECTION X—Continued.				
	No. 3	Triangulation.	James S. Lawson, assistant; P. A. Welker, aid.	Continuation of the primary triangulation of the coast of California north of Point Concepcion.
	4	Triangulation and topography.	Stehman Forney, assistant.	Survey of the coast of California continued from Moro Bay eastward.
	5	Hydrography.	Lieut. E. D. Taussig, U. S. N., assistant; Lieut. W. H. Lefavor, U. S. N.; Ensigns W. L. Burdick and P. B. Bibb, U. S. N.	Hydrographic survey of the California coast in the vicinity of San Simon.
	6	Triangulation.	George Davidson, assistant; R. A. Marry, subassistant; Fremont Morse, aid; C. B. Hill, acting aid.	Occupation of stations in continuation of the primary triangulation of the coast of California.
	7	Tidal observations.	E. Gray, tidal observer.	Self-registering tide-gauge record kept up at Saucelito, San Francisco Bay.
	8	Hydrography.	Lieut. E. D. Taussig, U. S. N., assistant; Ensigns J. N. Jordan, W. L. Burdick, J. A. Bell, and F. A. McNutt, U. S. N.	Hydrographic surveys on the California coast in Humboldt Bay and between Brushy Point and White Rock.
SECTION XI.				
Oregon and Washington Territory, including coast, interior bays, ports, and rivers.	No. 1	Triangulation and topography.	Louis A. Sengteller, assistant.	Survey of the Umpquah River, Oregon.
	2	Topography and hydrography.	Cleveland Rockwell, assistant.	Continuation of the topographical survey of the Columbia and Willamette Rivers. Hydrography of the Willamette River.
	3	Topography and reconnaissance.	J. J. Gilbert, assistant.	Completion of the topography of Hood's Canal, W. T. Reconnaissance of the Olympic Mountains.
	4	Hydrography.	Lieut. C. F. Forse, U. S. N., assistant; Ensign J. N. Jordan, U. S. N., assistant.	Hydrographic surveys in Hood's Canal, W. T.
	5	Triangulation and topography.	J. F. Pratt, assistant.	Triangulation and topography of Possession Strait and Sound, W. T.
	6	Reconnaissance and triangulation.	B. A. Colonna, assistant; J. F. Pratt, assistant.	Reconnaissance for the triangulation of the Strait of Fuca.
	7	Hydrography.	Lieut. Commander A. S. Snow, U. S. N., assistant; Lieut. G. Blocklinger, U. S. N.; Ensigns W. V. Bronaugh, F. M. Boatwick, and W. P. White, U. S. N.	Hydrographic survey of the Strait of Fuca.
SECTION XII.				
Alaska, including the coast and the Aleutian Islands.	No. 1	Hydrography.	Lieut. Richardson Clover, U. S. N., assistant; Ensigns W. McLean, C. C. Marsh, D. P. Menefee, T. G. Dowey, and A. P. Niblack, U. S. N.	Hydrographic surveys in Southeastern Alaska.
	2	Tidal observations.	W. J. Fisher and F. Sargent.	Tidal observations continued with self-registering tide-gauge at Saint Paul, Kodiak Island, Alaska.
SECTION XIII.				
Kentucky and Tennessee.	No. 1	Reconnaissance and triangulation.	A. T. Mosman, assistant; J. E. McGrath, aid.	Reconnaissance for extending the primary triangulation near the 39th parallel from West Virginia into Kentucky and Ohio.
	2	Geodetic operations.	Prof. A. R. Buchanan, acting assistant.	Occupation of stations in continuation of the triangulation of the State of Tennessee.
SECTION XIV.				
Ohio, Indiana, Illinois, Michigan, and Wisconsin.	No. 1	Reconnaissance and triangulation.	A. T. Mosman, assistant; J. E. McGrath, aid.	Reconnaissance for extending the primary triangulation near the 39th parallel into Ohio and Kentucky.

UNITED STATES COAST AND GEODETIC SURVEY.

APPENDIX No. 1—Continued.

Sections.	Parties.	Operations.	Persons conducting operations.	Localities of work.
SECTION XIV—Continued.	No. 2	Geodetic operations.	Prof. R. S. Devol, acting assistant.	Continuation of the triangulation of the State of Ohio.
	3	Geodetic operations.	Prof. J. L. Campbell, acting assistant; Prof. J. M. Coulter, recorder.	Occupation of stations in continuation of the triangulation of the State of Indiana.
	4	Triangulation.	George A. Fairfield, assistant; J. S. Bradford, assistant; J. B. Bou-telle, extraobserver; F. B. Bacon, recorder.	Extension of the primary triangulation near the 39th parallel eastward across the State of Illinois.
	5	Geodesic leveling.	John B. Weir, assistant; John Nelson, aid.	Progress made in connecting the line of trans-continental leveling with a point on the Gulf coast.
	6	Geodetic operations.	Prof. J. E. Davies, acting assistant.	Occupation of stations in continuation of the triangulation of the State of Wisconsin.
SECTION XV. Missouri, Kansas, Iowa, Nebraska, Minnesota, and Dakota.	No. 1	Triangulation.	F. D. Granger, assistant.	Occupation of stations for continuing to the west-ward the primary triangulation near the 39th parallel in Missouri and Kansas.
	2	Telegraphic longitudes.	Edwin Smith, assistant; C. H. Sinclair, assistant.	Determination of the longitude of Kansas City, Mo.
SECTION XVI. Nevada, Utah, Colorado, Arizona, and New Mexico.	No. 1	Reconnaissance and triangulation.	William Elmbeck, assistant; G. F. Bird, aid.	Continuation of reconnaissance and triangulation in Utah near the 39th parallel.
SPECIAL OPERATIONS.		Examination of methods of observation and photographic processes employed at the Magnetic Observatory, Toronto, Canada.	Marcus Baker, assistant.	
		Reports in regard to the suboffices at Boston, New York, and Philadelphia.	Henry Mitchell, assistant; F. J. Palmer, acting assistant; S. C. McCorkle, assistant.	
		Charge of the exhibit of the Coast and Geodetic Survey at the New Orleans Exposition.	George W. Dean, assistant; C. H. Boyd, assistant; J. J. Clark, mechanician.	
		Voyage of the new steamer C. P. Patterson from the Atlantic to the Pacific coast.	Lieut. Richardson Clover, U.S.N., assistant.	
		Tidal observations at Honolulu, Sandwich Islands.	Superintendent of Hawaiian Government Survey.	

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REPORT OF THE COMPUTING DIVISION, COAST AND GEODETIC SURVEY OFFICE, FOR THE YEAR
ENDING JUNE 30, 1885.COMPUTING DIVISION, COAST AND GEODETIC SURVEY OFFICE,
July 1, 1885.

DEAR SIR: In conformity with regulations, I herewith respectfully submit the usual annual report of work done by the several computers and others in this division of the office, for the fiscal year ending June 30, 1885.

The undersigned has continued in charge of the Computing Division, the personnel of which has with one exception remained as last year. The computing force sustained a serious loss by the resignation of Dr. J. G. Porter (now Director of the Cincinnati Observatory) soon after the beginning of the fiscal year. The place of this expert computer has not been filled. The Division was also deprived for nine months of the services of Mr. H. Farquhar, who was assigned to the party of Assistant C. S. Peirce.

This place was also left vacant during that time. The computing force being thus curtailed and having assigned to it the recomputation and adjustment to the Coast and Geodetic Survey triangulation of the Borden survey of Massachusetts, executed from 1832 to 1838, it became absolutely necessary to provide for some temporary assistance in order that the current work might be properly sustained. In consequence Mr. J. Nelson was assigned to the Computing Division from August 1, 1884, to September 20, 1884; Assistant O. H. Tittmann was assigned to it between September 16, 1884, and November 11; Assistant F. D. Granger reported for duty October 9, 1884, and was detached March 17, 1885; Mr. J. B. Boutelle reported for duty March 21, and continued to the close of the fiscal year; Mr. W. B. Fairfield reported for duty May 20, 1885, and left June 13, 1885; Mr. W. Auhagen was attached to the division during June, 1885. In consequence of the increased demand for professional information from field parties and for scientific and general information demanded in office correspondence, and in particular to satisfy calls from the United States Geological Survey, the services of Mr. E. A. Trescott as second clerk to the Division had to be retained throughout the year, and for nine days during June, 1885, Miss S. C. Ayres further assisted in copying records.

The Ooglaamic magnetic work, referred to in last year's report, was brought to a close soon after the beginning of the fiscal year, Sergeant (now Lieutenant) J. E. Maxfield being ordered on other duty July 12, 1884, and was seen through the press (forming 229 quarto pages) in May last. During this and the following month other heavy proof-reading (new edition of projection tables and new edition of table of factors for geodetic positions) was attended to. Special mention may be made of the following reports submitted by me:

On the results of the geodetic determination of the boundary lines of the District of Columbia; a discussion of the hypsometry of the Davidson quadrilaterals in central California; results of a new adjustment of all telegraphic longitudes, subject to geometrical conditions and determined by the Coast and Geodetic Survey; and an article entitled "The geodetic survey of the United States; its object and operations, considered from a theoretical and practical standpoint," with chart.

I have also completed a general collection of all magnetic dips and intensities determined in the United States from the earliest to the present time, arranged the material collected by States and Territories, and in each political division in the order of the latitudes of the stations and for each station, giving the separate results in chronological order. This work comprises nearly two thousand entries of dips and fifteen hundred entries of intensities. The discussion of the secular variation of the dip and of the horizontal and total intensities has been completed. I made also the usual annual determination of the magnetic elements at Washington on June 13 and 15, 1885.

The astronomical, geodetic, and magnetic records received at the office were examined for completeness of statements, and all data required in the office correspondence and referred to this division were promptly attended to.

A statement in detail of the work performed by each computer during the year is herewith appended.

Edward H. Courtenay attended to the preparation of geodetic data required by field parties

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