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TREASURY DEPARTMENT

UNITED STATES COAST AND GEODETIC SURVEY

HENRY S. PRITCHETT
SUPERINTENDENT

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DESCRIPTIVE CATALOGUE OF PUBLICATIONS

RELATING TO THE

U. S. COAST AND GEODETIC SURVEY

1807 to 1896

AND TO

U. S. STANDARD WEIGHTS AND MEASURES

1790 to 1896

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DESCRIPTIVE CATALOGUE OF PUBLICATIONS RELATING TO THE U. S. COAST AND GEODETIC SURVEY, 1807-1896, AND TO U. S. STANDARD WEIGHTS AND MEASURES, 1790-1896.

CLASSIFICATION.

I.—Annual Reports and other documents of the U. S. Coast and Geodetic Survey, and U. S. Standard Weights and Measures, 1807 to 1896. Also, Reports and other documents relating to U. S. Standard Weights and Measures, 1790-1896.

II.—A Subject-index to the professional papers contained in the Annual Reports, in the Bulletins, and in the occasional publications of the Survey from 1845 to 1896, inclusive.

III.—Bibliography (*a*); statistics (*b*); official reports of expenditures and of persons employed (*c*); tabular statements of information furnished (*d*); Annual Reports of office operations (*e*); and necrology (*f*).

IV.—Tide tables from the date of earliest publication by the Survey to the year 1896.

V.—Coast Pilots from the date of earliest publication by the Survey to the year 1896.

VI.—Catalogues of maps and charts published between 1843 and 1896.

VII.—Notices to mariners.

VIII.—Bulletins.

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I.

ANNUAL REPORTS AND OTHER DOCUMENTS OF THE U. S. COAST AND GEODETIC SURVEY, 1807 TO 1890, AND U. S. STANDAND WEIGHTS AND MEASURES, 1790 TO 1896.

U. S. COAST AND GEODETIC SURVEY.

REPORTS AND OTHER DOCUMENTS.

Date.	Subject.	Number of pages and size.
1807.		
Feb. 10.....	An act to provide for surveying the coast of the United States*	1, octavo.
Mar. 25	Circular letter addressed by the Secretary of the Treasury to F. R. Hassler, requesting that he would suggest the outlines of a plan for the survey of the coast, such as would unite correctness and practicability. [Transactions American Philosophical Society. Vol. II. New series.]	2, quarto.
Apr. 2	Letter of Mr. Hassler to the Secretary of the Treasury, transmitting a plan for putting into operation the survey of the coast of the United States. [Transactions American Philosophical Society. Vol. II. New series.]	13, quarto.
1808.		
.....	Part of volume of Executive reports—Receipts and Expenditures of the United States. Survey of the coast. [Tenth Congress.]	
Dec. 26.....	Part of estimates of appropriations for support of the Government for 1809. Surveying department. [Tenth Congress, second session.]	
1816.		
Apr. 4	Report on Coast Survey by the Secretary of the Treasury. Measures taken towards a survey of the coast, etc. [Executive reports, Fourteenth Congress, first session.]	13, quarto.
May 15.....	Communication made to the Secretary of the Treasury by F. R. Hassler, on the measures necessary to be taken to put into immediate operation such portions of the work as could be undertaken during the coming season.	
	NOTE.—The titles of the reports and other documents relating to the U. S. Coast Survey which follow, and which cover the years between 1816 and 1844, are taken for the most part from two octavo volumes published by Mr. Hassler, and containing in Volume I the "Principal documents relating to the survey of the coast of the United States since 1816 (New York, 1834)" and in Volume II the "Principal documents, etc., from October, 1834, to November, 1835 (New York, 1835)." These two volumes (340 pages, octavo) are bound into a large octavo volume and form part of the "Coast Survey and Weight and Measure Documents, 1832 to 1843." Poore's Descriptive Catalogue of Government Publications, 1774-1881, has also been consulted.	
June 11, 18; July 12; Aug. 3, 18.	Correspondence with the Treasury Department and articles of engagement between the Treasury Department of the United States and F. R. Hassler, relative to the survey of the coast of the United States.	9, octavo.
Nov. 23, 30 ..	First report of F. R. Hassler, Superintendent of the Survey of the Coast of the United States, to the Secretary of the Treasury upon the progress of the work.	3, octavo.
1818.		
Mar. 16	Message of President Monroe transmitting a report of the Secretary of the Treasury upon the progress made in the coast surveys. Instructions to the Superintendent and his report to the Secretary. [State Papers, No. 143, Fifteenth Congress, first session. Vol. II.]	21, octavo.
Apr. 9	Letter of Mr. Hassler to the Secretary of the Treasury, discussing the objects of the survey of the coast and reviewing the progress of the work.	5, octavo.
Apr. 14	An act to repeal part of the act entitled "An act to provide for surveying the coasts of the United States," approved April 14, 1818.	

* The first survey of any considerable extent of the coast of the United States was that of the North Carolina coast between Cape Hatteras and Cape Fear, as appears by letters of Albert Gallatin, Secretary of the Treasury, to the commissioners appointed for that duty.—[Executive documents, Ninth Congress, first session, April 27, 1806, and second session, January 23, 1807.]

U. S. COAST AND GEODETIC SURVEY—Continued.

REPORTS AND OTHER DOCUMENTS—Continued.

Date.	Subject.	Number of pages and size.
1818. Apr. 22	Letter of F. R. Hassler to the Secretary of the Treasury, in regard to the repeal of the act authorizing the survey of the coast and making statement of arrangements desirable for the preservation of the work already accomplished.	2, octavo.
Apr. 27	Communication by Mr. Hassler to the Secretary of War, respecting the transfer of the work of the Coast Survey to the War Department; also, a statement of the "Principal dates of the survey of the coast."	13, octavo.
1820. Nov. 16	Report of the Secretary of the Treasury of the money annually appropriated and paid since 1775 for surveying the seacoast, bays, inlets, harbors, and shoals, etc. [Senate Doc. No. 6, Sixteenth Congress, second session. Vol. I.]	11, octavo.
1828. May 1	Documents relative to coast surveys. Statements relative to the survey of the coasts of the United States. Surveys made, and by whom. [House Ex. Doc. No. 264, Twentieth Congress, first session. Vol. VI.]	11, octavo.
1831. Dec. 22	Documents referring to Coast Survey. Statements relative to the expediency of providing for the completion of the survey of the coasts of the United States. House Ex. Doc. No. 22, Twenty-second Congress, first session. Vol. II.]	11, octavo.
July 10	An act to carry into effect the act to provide for a survey of the coast of the United States. Approved July 10, 1832.	
July	Letter of F. R. Hassler to the Secretary of the Treasury, presenting the principles and views of his plan of operation for the survey of the coast as adopted in 1807.	9, octavo.
Aug. 6	Upon the articles of agreement between the Treasury Department of the United States and F. R. Hassler, relative to the survey of the coast of the United States.	2, octavo.
Aug. 9	Letter of the Secretary of the Treasury to F. R. Hassler, appointing him to make, under the direction of the Treasury Department, the survey of the coast as provided for by the acts of February 10, 1807, and July 10, 1832.	1, octavo.
Aug. 9	Circular letter from the Secretary of the Treasury, requesting all owners and occupiers of lands over which Mr. Hassler and his assistants may have occasion to pass in the performance of their public duties to permit them freely to pass over and remain on the same as long as may be necessary in executing the work of the survey of the coast.	
1833. Dec. 1	Letter of Mr. Hassler to the Secretary of the Treasury, reporting the progress made in the work of the survey of the coast.	2, octavo,
1834. Mar. 12	Letter from the Secretary of the Treasury to Mr. Hassler, informing him that, with the approval of the President, the superintendence of the Coast Survey has been transferred from the Treasury to the Navy Department.	
Mar. 14 to Apr. 14.	Correspondence of Mr. Hassler with the Secretary of the Navy, relative to the transfer of the Coast Survey to the Navy Department, with a "Continuation of the principal facts and dates relating to the Coast Survey, after the interruption of the work in 1818."	19, octavo.
May 17	Report by F. R. Hassler to the Secretary of the Navy upon the "Works executed for the survey of the coast of the United States, upon the law of 1832, and their junction with the works made in 1817 by and under the direction of F. R. Hassler."	14, octavo.
Nov. 11	Report of F. R. Hassler as Superintendent of the Survey of the Coast, addditional to that dated May 17, containing an account of the progress of that work during the summer and until November of 1834.	7, octavo.
1835. Feb. 17	Statement by F. R. Hassler of the "Considerations which make an increase of the appropriation proposed for the survey of the coast for the present year desirable and advantageous."	2, octavo.
May 8	Third report of F. R. Hassler as Superintendent of the Survey of the Coast, upon the progress of that work from November, 1834, to May, 1835.	4, octavo.

U. S. COAST AND GEODETIC SURVEY—Continued.

REPORTS AND OTHER DOCUMENTS—Continued.

Date.	Subject.	Number of pages and size.
1835. Nov. 22	Fourth report of F. R. Hassler, as Superintendent of the Survey of the Coast, upon the operations performed in that work between the months of May and December, 1835, with an estimate of the appropriation required for the next year's work.	6, octavo.
1836. Mar. 8	Statement made by Mr. Hassler to the Secretary of the Navy of reasons for placing the Coast Survey in the Treasury Department, and neither in the War nor Navy Departments.	2, octavo.
Mar. 25-27	The direction of the Coast Survey transferred from the Navy Department to the Treasury Department. See letters of March 25 from the Secretary of the Navy to Mr. Hassler, and of March 27 from Mr. Hassler to the Secretary of the Treasury.	15, octavo.
Apr. 13, 18, 30	Reports from the Secretary of the Treasury and the Chief of the Topographical Bureau, U. S. Army, upon the salaries of the Superintendent of the Coast Survey and his assistants, with remarks by Mr. Hassler in relation thereto.	15, octavo.
Nov. 19	Fifth report of F. R. Hassler, as Superintendent of the Coast Survey, * * * exhibiting the operations performed in 1836.	5, octavo.
Dec. 7	Report on the Coast Survey by the Secretary of the Treasury. Statement relative to the transfer of the Coast Survey from the Navy Department to the Treasury, with copies of correspondence relating to the subject, and the report of F. R. Hassler, Superintendent of the Survey. [Ex. Doc. No. 13, Twenty-fourth Congress, second session, Vol. I.]	60, octavo.

UNITED STATES COAST AND GEODETIC SURVEY AND U. S. STANDARD WEIGHTS AND MEASURES.

ANNUAL REPORTS.

FERDINAND RUDOLPH HASSLER, *Superintendent.*

Period of report.	Subject.	Number of pages and size.	Designation as a public document.
1837	United States Coast Survey	5, octavo	Twenty-fifth Congress, second session, No. 79, Senate.
	Weights and Measures	11, octavo	Do.
1838	United States Coast Survey	6, octavo	Twenty-fifth Congress, third session, No. 4, Senate.
	Weights and Measures	1, octavo	Do.
1839	United States Coast Survey	6, octavo	Twenty-sixth Congress, first session, No. 15, Senate.
	Weights and Measures	2, octavo	Do.
1840	United States Coast Survey	7, octavo	Twenty-sixth Congress, second session, No. 14, House of Representatives—Treasury Department.
	Weights and Measures	1, octavo	Do.
Dec., 1841		18, octavo	Twenty-seventh Congress, second session, No. 28, House of Representatives—Treasury Department.
Jan., 1842*		8, octavo	Twenty-seventh Congress, second session, No. 57, House of Representatives—Treasury Department.
Dec., 1842*		5, octavo	Twenty-seventh Congress, third session, No. 11, Senate.
Jan., 1843†		103, octavo	Twenty-seventh Congress, third session, No. 43, House of Representatives.
Feb., 1843†		93, octavo	Twenty-seventh Congress, third session, No. 170, House of Representatives.
Nov., 1843‡ and Jan., 1844.		8, octavo	Twenty-eighth Congress, first session, No. 97, House of Representatives—Treasury Department.

* Report in regard to progress and expenditures.
† Reports of select committee of the House of Representatives upon progress and expenditure in the Coast Survey.
‡ Last report of F. R. Hassler, as Superintendent of the Coast Survey, transmitted January 29, 1844, by the Secretary of the Treasury to Congress.

U. S. COAST AND GEODETIC SURVEY—Continued.

ANNUAL REPORTS.

ALEXANDER DALLAS BACHE, *Superintendent.*

Report for year ending—	Number of pages and size.	Number of appendices.	Number of illustrations.	Designation as a public document.
Nov., 1844	22, octavo	.....	4	Twenty-eighth Congress, second session, No. 25, House of Representatives—Treasury Department.
1845	44, octavo	4	3	Twenty-ninth Congress, first session, No. 38, House of Representatives—Treasury Department.
1846	74, octavo	11	9	Twenty-ninth Congress, second session, No. 6, House of Representatives—Treasury Department.
Oct., 1847	88, octavo	18	11	Thirtieth Congress, first session, Senate Ex., No. 6.
Nov., 1848	120, octavo	19	16	Thirtieth Congress, second session, Senate Ex., No. 1.
1849	98, octavo	20	16	Thirty-first Congress, first session, Senate Ex., No. 5.
1850	134, octavo	37	27	Thirty-first Congress, second session, House Ex. Doc. No. 12.
1851	559, octavo	57	.....	Thirty-second Congress, first session, Senate Ex. Doc. No. 3.
1851	quarto	.....	58	One volume, quarto, sketches accompanying the Annual Report of the Superintendent U. S. Coast Survey for 1851.
1852*	173, quarto	52	37	Thirty-second Congress, second session, House Ex., No. 64.
Oct., 1853	186, quarto	58	54	Thirty-third Congress, first session, Senate Ex., No. 14.
1854	288, quarto	73	58	Thirty-third Congress, second session, House Ex. Doc. No. 20.
1855	420, quarto	86	60	Thirty-fourth Congress, first session, House Ex. Doc. No. 6.
1856	358, quarto	86	67	Thirty-fourth Congress, third session, Senate Ex. Doc. No. 12.
1857	448, quarto	65	72	Thirty-fifth Congress, first session, Senate Ex. Doc. No. 33.
1858	464, quarto	50	40	Thirty-fifth Congress, second session, Senate Ex. Doc. No. 14.
1859	371, quarto	43	40	Thirty-sixth Congress, first session, House Ex. Doc. No. 41.
1860	409, quarto	45	30	Thirty-sixth Congress, second session, Senate Ex. Doc.
1861	270, quarto	34	31	Thirty-seventh Congress, second session, Senate Ex. Doc.
1862	434, quarto	40	41	Thirty-seventh Congress, third session, House Ex. Doc. No. 70.
1863	218, quarto	29	30	Thirty-eighth Congress, first session, Senate Ex. Doc.
1864	315, quarto	24	39	Thirty-eighth Congress, second session, Senate.

* Beginning with 1852, the reports of the Superintendent for each year appear in one volume, quarto.

JULIUS ERASMUS HILGARD, *Acting Superintendent.*

Oct., 1865	231, quarto	22	32	Thirty-ninth Congress, first session, House Ex. Doc. No. 75.
1866	140, quarto	20	30	Thirty-ninth Congress, second session, House Ex. Doc. No. 87.

BENJAMIN PEIRCE, *Superintendent.*

Oct., 1867	334, quarto	20	28	Fortieth Congress, second session, House Ex. Doc. No. 275.
1868	277, quarto	15	29	Fortieth Congress, third session, House Ex. Doc. No. 71.
1869	259, quarto	15	28	Forty-first Congress, second session, House Ex. Doc. No. 206.
1870	232, quarto	22	28	Forty-first Congress, third session, House Ex. Doc. No. 112.
1871	219, quarto	18	36	Forty-second Congress, second session, House Ex. Doc. No. 121.
1872	267, quarto	18	24	Forty-second Congress, third session, House Ex. Doc. No. 240.
1873	180, quarto	15	18	Forty-third Congress, first session, House Ex. Doc. No. 133.

U. S. COAST AND GEODETIC SURVEY—Continued.

ANNUAL REPORTS—Continued.

CARLILE POLLOCK PATTERSON, *Superintendent.*

Report for year ending—	Number of pages and size.	Number of appendices.	Number of illustrations.	Designation as a public document.
June, 1874	242, quarto	18	24	Forty-third Congress, second session, House Ex. Doc No. 100.
1875	412, quarto	20	37	Forty-fourth Congress, first session, House Ex. Doc. No. 81.
1876	416, quarto	23	37	Forty-fourth Congress, second session, Senate Ex. Doc No. 37.
1877	192, quarto	15	25	Forty-fifth Congress, second session, Senate Ex. Doc. No. 12.
1878	304, quarto	11	39	Forty-fifth Congress, third session, Senate Ex. Doc. No. 13.
1879	213, quarto	16	53	Forty-sixth Congress, second session, Senate Ex. Doc. No. 17.
1880	419, quarto	19	84	Forty-sixth Congress, third session, Senate Ex. Doc. No. 12.

JULIUS ERASMUS HILGARD, *Superintendent.*

June, 1881	471, quarto	18	63	Forty-seventh Congress, first session, Senate Ex. Doc. No. 49.
1882	565, quarto	24	52	Forty-seventh Congress, second session, Senate Ex. Doc. No. 77.
1883	488, quarto	19	50	Forty-eighth Congress, first session, Senate Ex. Doc. No. 29.
1884	622, quarto	19	25	Forty-eighth Congress, second session, House Ex. Doc. No. 43.

NOTE.—Abstracts of the reports for 1882, 1883, and 1884 were prepared for early distribution and published as Treasury Department documents 364, 541, and 652 Coast and Geodetic Survey, each abstract containing about 20 pages octavo.

FRANK M. THORN, *Superintendent.*

June, 1885	516, quarto	18	46	Forty-ninth Congress, first session, House Ex. Doc. No. 18.
1886	435, quarto	13	39	Forty-ninth Congress, second session, House Ex. Doc. No. 40.
1887	514, quarto	16	49	Fiftieth Congress, first session, House Ex. Doc. No. 17.
1888	566, quarto	14	60	Fiftieth Congress, second session, House Ex. Doc. No. 22.

THOMAS CORWIN MENDENHALL, *Superintendent.*

June, 1889	503, quarto	18	50	Fifty-first Congress, first session, House Ex. Doc. No. 55.
1890	780, quarto	20	71	Fifty-first Congress, second session, House Ex. Doc. No. 80.
1891	Part I—186, quarto Part II—746, octavo	16	20 34	Fifty-second Congress, first session, House Ex. Doc. No. 43.
1892	Part I—198, quarto Part II—552, octavo	12	17 35	Fifty-second Congress, second session, Senate Ex. Doc. No. 37.
1893	Part I—167, quarto Part II—639, octavo	12	19 21	Fifty-third Congress, second session, Senate Ex. Doc. No. 37.

W. W. DUFFIELD, *Superintendent.*

June, 1894	Part I—165, quarto Part II—615, quarto	10	20 24	Fifty-third Congress, third session, Senate Ex. Doc. No. 8.
1895	516, quarto	11	49	Fifty-fourth Congress, first session, Senate Ex. Doc. No. 25.
1896	722, quarto	12	33	Fifty-fourth Congress, second session, Senate Ex. Doc. No. 35.

NOTE.—For other papers and documents relating to the U. S. Coast and Geodetic Survey, printed or published from the year 1844 until the year 1896, see Bibliography.

UNITED STATES STANDARD WEIGHTS AND MEASURES.

REPORTS AND OTHER DOCUMENTS.

1790 to 1896.

Date.	Subject.	Number of pages and size.
	NOTE.—The titles which are here given of papers having an official character or a historical interest relating to U. S. Standard Weights and Measures, and which were printed or published between 1790 and 1830, have been taken (with some slight changes) from Poore's Descriptive Catalogue of Government Publications of the United States, 1774 to 1881.	
1790.		
Jan. 8.....	Annual message to Congress. President Washington..... [First Congress, second session.] The President urges the importance of uniformity in the currency, weights, and measures of the United States.	
July 4.....	Report on Weights, Measures, and Coinage—By Thomas Jefferson, Secretary of State. [Ex. Docs., First Congress, second session.] On the subject of establishing a uniformity in the weights, measures, and coins; consideration upon the use of the pendulum as a measure of determinate length; recommends that the standard of measure be an uniform cylindrical rod of iron of such length that it shall perform its vibrations in small and equal arcs in one second of mean time; weights and measures in use in Great Britain; reports of committees of the House of Commons in 1757-59; examination of the system of measures in use in the United States; standard for coins; recommendations for changes in the weights and measures in the United States; the measures, weights, and coins of the decimal system, estimated in those of England, now used in the United States.	
1791.		
Oct. 5.....	Annual message to Congress..... [Second Congress, first session.] President Washington calls attention to the necessity of action upon the subject of uniformity in currency, weights, and measures.	
1792.		
Apr. 5.....	Report of the Committee on Weights and Measures—R. Izard, Senator.. [Journal of the Senate, Second Congress, first session, pp. 173, 174.] Fixing a standard for weights and measures; directions for the scientific construction of a standard rod; division of the rod into five equal parts, one of which shall be called a foot; measures in the survey of lands; units of weight.	2.
1795.		
Jan. 9.....	Communication from minister of French Republic..... [Ex. Docs., Third Congress, second session.] Regarding the adoption by the United States of a system of weights and measures conformable to that lately adopted by France; detailed description of the new method; standards of mensuration; standard of weight; division of the standards into decimal parts.	
1796.		
Apr. 12.....	Reports on Weights and Measures—Representative Carter B. Harrison. [Ex. Docs., Fourth Congress, first session.] Regulations of the standard of weights and measures; divisions of the pound; divisions of the ounce; scientific experiments to be made by scientists to be employed by the Government to fix upon a standard of weights and measures.	7.
1819.		
Jan. 25.....	Report on a standard of weights and measures—Select committee of Congress. [House Docs. No. 109, Fifteenth Congress, second session. Vol. VI.] Recommends that models of the yard, bushel, and pound, conforming to those in most common use, be made under the direction of a commission to be selected by the President, and which, if satisfactory to Congress, shall be declared the standard weights and measures of the United States.	12.
1821.		
Feb. 22.....	Report on Weights and Measures—By John Quincy Adams, Secretary of State. [Ex. Papers, No. 109, Sixteenth Congress, second session. Vol. VIII.] Plan of a standard of weights and measures to be adopted by the United States, prepared in conformity with a resolution of the House of Representatives, dated December 14, 1819.	245.
1822.		
Mar. 11.....	Report on Weights and Measures—Select committee..... [Reports of committees, No. 65, Seventeenth Congress, first session, Vol. I.] The President of the United States should be requested to obtain for the use of the different States and Territories duplicates of the English measures, weights, etc.	4.

UNITED STATES STANDARD WEIGHTS AND MEASURES—Continued.

REPORTS AND OTHER DOCUMENTS—Continued.

Date.	Subject.	Number of pages and size.
1830. May 29.....	Extract from Senate Journal: On motion of Mr. Woodbury, and by unanimous consent, *Resolved*, That the Secretary of the Treasury be directed to cause a comparison to be made of the standards of weights and measures now used at the principal custom-houses in the United States, and report to the Senate at the next session of Congress. NOTE.—The titles which follow of the reports and other documents relating to United States weights and measures have been taken chiefly from copies of the documents themselves on file in the libraries of the Coast and Geodetic Survey and the Office of Standard Weights and Measures. The greater part of them are found in three bound volumes, octavo, viz: Coast Survey and Weight and Measure Documents, 1832 to 1843; Congressional and Departmental Documents, Vol. I, 1830-1856, Vol. II, 1857-1889.	
1831. Mar. 3	Report on Weights and Measures—By S. D. Ingham, Secretary of the Treasury. [Senate Docs., No. 74, Twenty-first Congress, second session. Vol. II.] Relative to comparison of weights and measures used in custom-houses.	2, octavo.
Apr. 30, June 18.	Letters of the Secretary of the Treasury to F. R. Hassler, Superintendent United States Standard Weights and Measures, respecting permanent standards of weights and measures for the Treasury Department; the manufacture of weights and measures for all the custom-houses in the United States, and the adoption of units of weight and of capacity.	2, octavo.
1832. Mar. 5	An enumeration by Mr. Hassler of the objects and statements desirable to form a collection of standard weights and measures of foreign countries for the Department of State of the United States.	3, octavo.
June 20.....	Report of the Secretary of the Treasury, in compliance with a resolution of the Senate, showing the result of an examination of the weights and measures used in the several custom-houses in the United States. [Twenty-second Congress, first session, Doc. No. 299, House of Representatives.]	122, octavo.
1834. July and Aug., and Jan. and Feb., 1835.	Correspondence with the Secretary of the Treasury, and reports of progress in the construction of standard weights and measures. F. R. Hassler, Superintendent.*	20, octavo.
1835. Feb. 27.....	Mr. Binney, from select committee to which the subject had been referred, made the following report on a memorial from citizens of Philadelphia, praying Congress to establish a standard of weights and measures throughout the Union, and uniform mode of applying and conforming to the same. [Twenty-third Congress, second session, Report No. 132, House of Representatives.]	31, octavo.
Dec. 26.....	Letter from the Secretary of the Treasury, transmitting information in relation to a standard of weights and measures. [Twenty-fourth Congress, first session, Doc. No. 32, House of Representatives—Treasury Department.]	7, octavo.
1836. Jan. 30.....	Report of the Committee on Commerce in relation to the expediency of furnishing the States and Territories with the standard weights and measures selected and adopted by the Executive, to be used in the collection of the revenue of the United States. [Twenty-fourth Congress, first session, Report No. 259, House of Representatives.]	2, octavo.
Mar. 21	Mr. Pinckney, from the Committee on Commerce, submitted a report on a resolution directing them to inquire into the expediency of providing for the distribution among the States and Territories of the same standards of weights and measures which have been ordered to be provided for the custom-houses. [Twenty-fourth Congress, first session, Report No. 449, House of Representatives.] NOTE.—This is a report substantially the same in effect as the one of January 30, 1836, and recommends the adoption of the same resolution.	2, octavo.

* Contained in volume with following title: Documents relating to the construction of uniform standards of weights and measures for the United States, from 1832 to 1835. Published by F. R. Hassler, superintendent of the work. New York: Printed by John Windt, 1836

UNITED STATES STANDARD WEIGHTS AND MEASURES—Continued.

REPORTS AND OTHER DOCUMENTS—Continued.

Date.	Subject.	Number of pages and size.
1836. Apr. 30, and May 13, 18.	Correspondence with the Secretary of the Treasury in relation to a comparison of the Troy pound sent from England with the Troy pound of the United States Mint, and relative to the construction of standard weights for the United States Mint at Philadelphia.	5, octavo.
June 16	Letter of the Secretary of the Treasury to F. R. Hassler, Superintendent of Weights and Measures, inclosing copy of a joint resolution of Congress in regard to the preparation of complete sets of standard weights and measures for each of the States of the Union.	8, octavo.
June 17	Reply of Mr. Hassler to the Secretary	2, octavo.
July 28, and Aug. 10.	Letters of Mr. Hassler to the Secretary relating to the completion and delivery of six sets of standard weights, one set to the Treasury Department and five sets for custom-houses.	2, octavo.
Nov. 19	Report of Progress in the construction of standard weights and measures, by F. R. Hassler, Superintendent. [This report is combined with that of the Coast Survey.]	2, octavo.
1837. Nov. 18	Report of F. R. Hassler, Superintendent Weights and Measures, upon the establishment of the system of ounce weights for the mints of the United States. [Above forms part of Senate Doc. No. 79 and of House Doc. No. 20, Twenty-fifth Congress, second session.]	10, octavo.
1838. July 3	Letter from the Secretary of the Treasury, transmitting a report of F. R. Hassler, stating that complete sets of standard weights and measures for the respective States of the Union have been prepared and are now ready for delivery. [House Doc. No. 454, Twenty-fifth Congress, second session—Treasury Department.]	
June 26	Report to the Treasury Department of the United States upon the construction and completion of the standards of weight for all the States of the Union. [House Doc. 454, Twenty-fifth Congress, second session.]	6, octavo.
Nov. 14	Seventh report of F. R. Hassler, as superintendent of the construction of standards of weights and measures. [Part of Senate Doc. No. 4, Twenty-fifth Congress, third session.]	1, octavo.
1839. Nov. 16	Upon the construction of the standards of weights and measures..... [Part of Senate Doc. No. 15 and of House Doc. No. 20, Twenty-sixth Congress, first session.]	2, octavo.
1840. July 10	Report upon the completion of the standard yard measures for the respective States—by F. R. Hassler, Superintendent of Weights and Measures. [House Doc. No. 261, Twenty-sixth Congress, first session.]	6, octavo.
Nov. 17	Upon the construction of standard weights and measures..... [Part of House Doc. No. 14, Twenty-sixth Congress, second session.]	1, octavo.
1841. June 22.....	Report upon the completion of the standard ounce weights for all the States of the Union—by F. R. Hassler, Superintendent of Weights and Measures. [House Doc. No. 33, Twenty-seventh Congress, first session.]	4, octavo.
1842. Apr. 5	Report upon the construction of standards of liquid capacity measures, with descriptions of the apparatus devised for standarding, tables of last weighings, and ultimate results of adjustment. With 3 illustrations. [Senate Doc. No. 225 and House Doc. No. 176 Twenty-seventh Congress, second session.]	26, octavo.
June 29	Report by F. R. Hassler upon the works of the establishment of uniform weights and measures for the United States, made upon a call from the select committee of the House of Representatives.	17, octavo.
Dec. 19.....	Letter from the Secretary of the Treasury, transmitting a report of Prof. Hassler, Superintendent of the Coast Survey, the last paragraphs of which relate to weights and measures. [House Doc. No. 23 and Senate No. 11, Twenty-seventh Congress, third session—Treasury Department.]	

UNITED STATES STANDARD WEIGHTS AND MEASURES—Continued.

REPORTS AND OTHER DOCUMENTS—Continued.

Date.	Subject.	Number of pages and size.
1843. Mar. 2	Committee on Commerce (Mr. Randall), to whom was referred the petition of William Nixon, reports adversely to the adoption of the metric system of weights and measures. [House Report No. 285, Twenty-seventh Congress, third session.]	
Apr., June, and Nov., and Jan. 31, 1844.	Reports of F. R. Hassler, as superintendent of the construction of standards of weight and measure, upon the progress of the works in the construction of standards since December, 1842. [House Doc. No. 94, Twenty-eighth Congress, first session.] Report transmitted to Congress by the Secretary of the Treasury after the death of Mr. Hassler, together with a tabular statement of the work executed for the system of uniform standards for the United States from the beginning of the year 1836 to June, 1842, with their state at that epoch, and the additions made until November, 1843. Six illustrations.	
1845. Feb. 26, 27...	Report of Alexander Dallas Bache, Superintendent, on the construction of standard weights, measures, and balances for the year 1844. [Senate Doc. No. 149 and House Doc. No. 159, Twenty-eighth Congress, second session.]	32, octavo.
1846. Apr. 25 and Aug. 7.	Report upon the progress made in the construction of standard weights, measures, and balances in the year 1845, under the superintendence of A. D. Bache. [Senate Doc. No. 483, Twenty-ninth Congress, first session.]	23, octavo.
1848. July 30 and Aug. 12.	Report to the Treasury Department, by A. D. Bache, on the progress of the work of constructing standards of weights and measures, and balances, in the years 1846 and 1847. Four illustrations. [Senate Ex. Doc. No. 73 and House Ex. Doc. No. 84, Thirtieth Congress, first session.]	29, octavo.
Dec. 12.....	Reports from the Secretary of the Treasury of scientific investigations in relation to sugar and hydrometers, made under the superintendence of A. D. Bache, by Prof. R. S. McCulloch. Revised edition by order of the Senate. [Senate Ex. Doc. No. 50, Thirtieth Congress, first session.]	
1851. Feb. 7, 10....	Letter from A. D. Bache, Superintendent of Weights and Measures, communicating a report of the computation of a manual of tables to be used with the hydrometers recently adopted in the United States custom-houses. With six illustrations. [Senate Ex. Doc. No. 28, Thirty-first Congress, second session.]	168, octavo.
1856. Dec. 31.....	Report to the Treasury Department of progress made under the superintendence of Alexander D. Bache, in the construction and distribution of standards of weights and measures, and supply of hydrometers to custom-houses; also of balances made and distributed to the States, and the laws severally enacted therein relative to standard weights and measures from the 1st of January, 1848, to the 31st of December, 1856. Six illustrations. [Senate Ex. Doc. No. 27, Thirty-fourth Congress, third session.]	218, octavo.
1858. Dec. 15.....	Report of the Secretary of the Treasury, communicating, in answer to a resolution of the Senate, a report showing the amount expended and the progress made in the Coast Survey, and also (pp. 222-287) the weights and measures furnished the several States and custom-houses and their cost. [Senate Ex. Doc. No. 6, Thirty-fifth Congress, second session.]	
1866. May 17	Mr. Kasson, from the Committee on Coinage, Weights, and Measures, made a report upon the general subject of a uniform system of coinage, weights, and measures, accompanied by bills and resolutions which, as acts of Congress, were approved July 28, 1866. [House Report No. 62, Thirty-ninth Congress, first session.]	
1867. Mar. 7	Letter of the vice-president of the National Academy of Sciences, communicating, in obedience to law, a report of the proceedings of the Academy during the year 1866. Report on hydrometers, densities, and Manual for Inspectors of Spirits, etc. [Senate Mis. Doc. No. 44, Fortieth Congress, first session.]	
1869. Nov. 15	Report by Benjamin Peirce, Superintendent of Standard Weights and Measures, to the Secretary of the Treasury, upon the progress made in the construction of metric standards of length, weight, and capacity, in pursuance of a joint resolution of Congress of July 27, 1866.	4, octavo.

UNITED STATES STANDARD WEIGHTS AND MEASURES—Continued.

REPORTS AND OTHER DOCUMENTS—Continued.

Date.	Subject.	Number of pages and size.
1871. Nov. 30	Report of an examination of weights and balances at the branch mint, United States, San Francisco, Cal.—by George Davidson, Assistant, U. S. Coast Survey.	
1875. Aug. 17	Memorial to Congress in favor of an International Bureau of Weights and Measures. Signed by F. A. P. Barnard, chairman committee; J. E. Hilgard, H. A. Newton. J. L. Smith, Joseph Henry, W. B. Rogers, Benj. Peirce, E. B. Elliott.	
1876. Mar	Report on the proposed International Bureau of Weights and Measures at Paris. Giving a concise history of what has been done by the International Conference—by J. E. Hilgard, Assistant, U. S. Coast Survey, and delegate from the United States to the International Commission.	
Mar. 1	Papers relating to metric standards distributed to the States of the Union under a joint resolution of Congress of July 27, 1866, including a description of the metric standards, with directions for their use—by J. E. Hilgard, Inspector U. S. Standard Weights and Measures.	6, octavo.
	The relation of the lawful standards of measure of the United States to those of Great Britain and France—J. E. Hilgard. [Published as Appendix No. 22, to U. S. Coast Survey Report for 1876.]	5, quarto.
1877.	Comparison of American and British standard yards—J. E. Hilgard. [Published as Appendix No. 12 to U. S. Coast Survey Report for 1877.]	33, quarto.
1878. Mar. 21, 23, 28	Letters of C. P. Patterson, Superintendent Coast Survey, and of J. E. Hilgard, Assistant Coast Survey and Inspector U. S. Standard Weights and Measures, in relation to the proposition for making the use of the metrical system of weights and measures obligatory in all governmental and individual transactions, embodied, with other statements, in a communication from the Secretary of the Treasury, in response to a resolution of the House of Representatives.	7, octavo.
	[House Ex. Doc. No. 71, Forty-fifth Congress, second session.]	37, octavo.
May 8, 18	Statement of J. E. Hilgard, Inspector U. S. Weights and Measures, before the Committee on Coinage, Weights, and Measures, of the House of Representatives, concerning the standard weights and measures of the United States. [House Mis. Doc. No. 61, Forty-fifth Congress, second session.]	12, octavo.
June 11	International Bureau of Weights and Measures. Message from the President of the United States transmitting a communication from the Secretary of State in response to a resolution of the House of Representatives, in relation to the convention for establishing an International Bureau of Weights and Measures. [House Ex. Doc. No. 96, Forty-fifth Congress, second session.]	
1880. Feb. 12	Report by Mr. Stephens, of Committee on Coinage, Weights, and Measures, on the metric system of coinage. [House Report No. 203, Forty-sixth Congress, second session.]	
Mar. 5	Report of Mr. Vance, of Committee on Coinage, Weights, and Measures, on a decimal system of weights and measures for the English-speaking nations. [House Mis. Doc. No. 29, Forty-sixth Congress, second session.]	
1881. Mar. 3	Complete set of standard weights and measures to be furnished for the use of the agricultural colleges. Approved March 3, 1881. [Public resolution No. 23.] Joint resolution, directing the Secretary of the Treasury to cause a complete set of all the weights and measures adopted as standards to be delivered to the governor of each State in the Union for the use of agricultural colleges, etc.	
1886. Jan. 29	Letter from the Secretary of the Treasury, transmitting letter from the Superintendent of the Coast and Geodetic Survey, relative to supplying balances, weights, and measures to Territories, etc. [Senate Ex. Doc. No. 55, Forty-ninth Congress, first session.]	
1888. Apr. 26	Letter from the Secretary of the Treasury, transmitting an estimate from the Secretary of State of an appropriation to supply deficit for the International Bureau of Weights and Measures. [House Ex. Doc. No. 283, Fiftieth Congress, first session.]	

UNITED STATES STANDARD WEIGHTS AND MEASURES—Continued.

REPORTS AND OTHER DOCUMENTS—Continued.

Date.	Subject.	Number of pages and size.
1889. June 15	Bulletin No. 9.—On the relation of the yard to the metre. By O. H. Tittmann, assistant.	6, quarto.
	Appendix No. 6.—Annual Report of the U. S. Coast and Geodetic Survey, 1889. The relation between the metric standards of length of the U. S. Coast and Geodetic Survey and the U. S. Lake Survey.	19, quarto.
Sept. 16	Letter to the Secretary of State transmitting a report upon the subject of weights and measures for the information of the United States delegates to the International American Congress—by T. C. Mendenhall, Superintendent U. S. Coast and Geodetic Survey, and of Weights and Measures.	7, large octavo.
Nov. 30	Verification of Weights and Measures. By O. H. Tittmann, assistant. (One plate.) [Coast and Geodetic Survey Bulletin No. 15, 1889.]	2.
1890. Jan. 15	International American Conference. Report of the committee on weights and measures, as adopted by the conference.	7, large octavo.
January	U. S. Coast and Geodetic Survey. Office of Standard Weights and Measures. T. C. Mendenhall, Superintendent. Tables for converting United States weights and measures, metric and customary.	2, quarto.
	Appendix No. 16.—1890. On the relation of the yard to the metre. [Republication, with additions, by Assistant O. H. Tittmann, of his paper first published as Bulletin No. 15.]	6, quarto.
Feb. 18	Table for the reduction of hydrometer observations of salt-water densities. Prepared for publication by O. H. Tittmann, assistant. [Coast and Geodetic Survey Bulletin No. 18, 1890.]	3, quarto.
May 6	Appendix No. 18.—1890. Historical account of United States standards of weights and measures, customary and metric; of the inception and construction of the national prototypes of the metre and kilogramme; of their transportation from Paris to Washington; of their official opening and certification, and of their deposit in the Office of Weights and Measures. (One illustration.) Compiled by O. H. Tittmann, assistant in charge of the Office of Standard Weights and Measures. Brief account of the weights and measures in customary use in the United States, with the legislation relating thereto; customary length measure; customary standard of weight; capacity measures; weights and measures for agricultural colleges; metric standards; coefficient of expansion of the metre bars; construction of the kilogrammes; report of Dr. B. A. Gould, delegate from the United States to the International Conference of Weights and Measures, held at Paris, September, 1889; prototypes of the standard metre and kilogramme of the Bureau International des Poids et Mesures; report of Assistant George Davidson upon delivering one set of these prototypes to Prof. T. C. Mendenhall, Superintendent U. S. Coast and Geodetic Survey, and of Weights and Measures; certificate of President Benjamin Harrison in relation to the opening of the national prototypes of the metre and kilogramme; report of Assistant O. H. Tittmann upon the transportation of national prototype metre, No. 21, and national prototype kilogramme, No. 4, from Paris to Washington; descriptions and certificates of these prototypes.	24, quarto.
1891.	Appendix No. 6.—On the reduction of hydrometer observations of salt-water densities. Submitted for publication by O. H. Tittmann, assistant in charge of the Office of Weights and Measures. Revised for republication February 1, 1892.	3, octavo.
1892. Aug. 24 (Part 2.)	Appendix No. 10.—1892. On the Last Square Adjustment of Weighings. A report prepared by direction of O. H. Tittmann, assistant in charge of the Office of Standard Weights and Measures, by J. F. Hayford.	13, octavo.
1893. Apr. 5 (Part 2.)	Appendix No. 6.—1893. Fundamental Standards of Length and Mass. By T. C. Mendenhall. Note.—This paper was first published as Bulletin No. 26, and is republished here to give it a more permanent form. Appended to it will be found a third edition of the table for converting customary and metric weights and measures.	8, octavo.
1893. (Part 2.)	Appendix No. 7.—1893. Units of Electrical Measure. By T. C. Mendenhall, approved by J. G. Carlisle, Secretary of the Treasury. Approved for publication December 27, 1893. Published also as Bulletin No. 30.	4, octavo.
1895. (Part 2.)	Appendix No. 9.—1895. Report on the Rueprecht Balance belonging to the United States Office of Standard Weights and Measures. Prepared by J. F. Hayford. (Two illustrations, Nos. 40 and 41.)	10, quarto.

II.

A SUBJECT-INDEX TO THE PROFESSIONAL PAPERS CONTAINED IN THE ANNUAL REPORTS, IN THE BULLETINS, AND IN THE OCCASIONAL PUBLICATIONS OF THE U. S. COAST AND GEODETIC SURVEY FROM 1845 TO 1896, INCLUSIVE.

KEY TO INDEX.

GEODESY:
- Base lines and standards of length.
- Reconnaissance.
- Triangulation and instruments.
- Time.
- Latitude.
- Longitude.
- Azimuth.
- Arc measures and local deflection of the plumb line.
- Gravity.
- Geographical positions and projections.
- Geographical explorations.

HYPSOMETRY:
- Spirit leveling.
- Trigonometric and barometric heights.

SURVEYING:
- Topography.
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PHYSICAL HYDROGRAPHY:
- Tides, currents, winds, and shoreline changes due to action of the sea.
- Gulf-stream explorations.
- Deep-sea soundings, temperatures, and densities.
- Surveys and explorations of oyster beds.

TERRESTRIAL MAGNETISM.

ASTRONOMY.

MATHEMATICS.

DRAWING, ENGRAVING, AND ELECTROTYPING.

MISCELLANEOUS.

GEODESY.

BASE LINES AND STANDARDS OF LENGTH.

Year.	Appendix.	Pages.	Subject and author.
1854	35	103–108	Base-measuring apparatus, description of, as used in the Coast Survey.—Lieut. E. B. Hunt, U. S. Engineers.—[Sketch 54.]
1855	41	264–267	Preliminary base apparatus.—C. O. Boutelle.—[Sketch 53.]
1856	60	308–310	Subsidiary base apparatus. Description of a modification devised for ascertaining the temperature of rods in use.—[Sketch 64.]
1857	26	302–305	Epping base, Maine.—A. D. Bache. Notes on the preparation of site, measurement of line, and progress, as compared with other measurements of the Coast Survey.—[Sketch 3.]
1857	45	395–398	Base apparatus for measuring subsidiary lines; description.—J. E. Hilgard.—[Sketch 69.]
1862	26	248–255	Base-measuring apparatus.—J. E. Hilgard. Results of experiments for determining the length and rate of expansion by heat of the six-metre standard bar, with table of comparisons of standard bar with six metres.—[Sketch 49.]

GEODESY—Continued.

BASE LINES AND STANDARDS OF LENGTH—Continued.

Year.	Appendix.	Pages.	Subject and author.
1864	14	120–144	Epping base line.—C. A. Schott. Report on the method of computation and resulting connection with the primary triangulation.—(1) General remarks on the method of reduction; (2) instruments and methods of horizontal measures employed in the triangulation near the Epping base; (3) determination of probable error and weight to each direction observed with the 30-inch theodolite; station Howard; abstract of remaining differences; abstract of remaining errors; table; (4) determination of probable error and weight to each angle and direction from observations with a repeating circle; (5) resulting horizontal angles from the observations at each station, with their probable error; (6) effects upon the horizontal angles of a difference of level between the stations occupied and observed upon; (7) spherical excess of triangles; (8) residuals in the sum of angles of each triangle, and their discussion; (9) final determination of probable errors (and weights) to each direction; (10) relative value of results from the 30-inch and the 10-inch repeating theodolites; (11) formation of the conditional equation of the nonagon around the Epping base; (12) equation of correlatives and normal equations; (13) resulting correction to the observed directions; (14) complete adjustment of the nonagon and final directions; (15) triangle side computations; (16) resulting distances from Mount Desert to Humpback; (17) connection of the azimuth mark with the adjusted directions.—[Errata, 143: 1866, p. 141.]
1865	21	187–203	Results of the primary triangulation of the coast of New England, from the northeastern boundary to the vicinity of New York; length and accuracy of the Fire Island base line; length and accuracy of the Massachusetts base line; length and accuracy of Epping base line; geodetic connection of the three primary base lines in Maine, Massachusetts, and New York; their degree of accordance and resulting accuracy of the primary triangulation intervening; resulting angles and distances of the primary triangulation between the Epping, Massachusetts, and Fire Island base lines.—[Errata, 198: 1866, p. 141.]
1866	8	49–54	Primary triangulation of the Atlantic coast.—C. A. Schott. Geodetic connection of the two primary base lines in New York and Maryland, their degree of accordance and accuracy of the primary triangulation intervening, with the resulting angles and distances as finally adjusted.
1866	8	140	Length of the Kent Island base line.—[Supplement to C. A. Schott's report on primary triangulation of the same year.]
1867	7	134–137	Comparison of metres.—F. A. P. Barnard and H. Tresca. Comparison of an iron metre forwarded to France by the Government of the United States of America; Table I, the United States metre upon the comparator; II, the Conservatoire standard upon the comparator; III, the United States metre upon the comparator; IV, results.
1868	7	133–139	Full explanation of the different successive operations connected with the measurement of a subsidiary base line.
1869	6	105–112	Connection of the primary base lines on Kent Island, Md., and on Craney Island, Va., and on the degree of accuracy of the intervening primary and subprimary triangulation.—C. A. Schott. Statistics of conditions; linear discrepancies in the base lines; degree of accuracy; final correction of directions; adjustment of the subprimary stations; Cape Charles Light and North end of measurement; adjustment of the secondary station, Hampton Seminary; table of Atlantic series of primary triangles continued.
1873	12	123–131	Peach Tree Ridge base, near Atlanta, Ga.—C. A. Schott. Measurement of line in 1872, 1873, by C. O. Boutelle (Sketch No. 18); condition of the apparatus; comparison of the tubes; synopsis of results; table of horizontal distances measured between temporary marks near the monuments in each of the three measures; corrected distances; discrepancies in the three measures; heights above mean half tide; probable error of computed length; comparison with the accuracy of other base lines.
1873	12	132–136	Description of the compensation base apparatus of the United States Coast Survey.—E. B. Hunt. (Reprinted from Appendix No. 35, Coast Survey Report of 1854.)
		136	Supplement.—The "Borda thermometer" attachment.
1876	22	402–406	The relations of the lawful standards of measure of the United States to those of Great Britain and France.—J. E. Hilgard. Measures of weight, of capacity, of length; relation of yard to metres. Annex I. An act to authorize the use of the metric system of weights and measures; measures of length, of surface, of capacity, weights. Annex II. Comparison of yards and metres.

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GEODESY—Continued.

BASE LINES AND STANDARDS OF LENGTH—Continued.

Year.	Appendix.	Pages.	Subject and author.
1877	12	148-181	Comparison of American and British standard yards.—J. E. Hilgard. (1) Relation of the lawful standards of measure of the United States to those of Great Britain and France; measures of weight, capacity, length; relation of yard to metre; annex I, resolution of Congress providing for the distribution of weights and measures; II, an act to authorize the use of the metric system of weights and measures, measures of length, surface, capacity, weights; annex III, comparison of yards and metres; (2) description of the Troughton 86-inch scale; (3) description of British standard yards, bronze No. 11, and iron No. 57. Coefficient of expansion of the British standard yard bar, bronze No. 11; being a new discussion of the experiments of Sheepshanks and Clarke.—By J. Homer Lane. The relative expansion of bronze 12, and Low Moor iron; for absolute expansion of bronze 12 and brass; equations of condition; recapitulation; addendum by O. H. Tittmann; (5) relative lengths of bronze yard No. 11 and iron yard No. 57; experimental comparisons on the dividing machine; comparison on line and end comparator; on the beam compass comparator; comparisons of British bronze yard No. 11 with the Imperial yard and other standards of Great Britain; (1) comparisons with standards of the Dominion of Canada; abstract of comparisons between No. 11 and No. 16; between No. 11 and Dominion Standard A; between Dominion Standard A and No. 16; comparisons with the Imperial yard and other standards of the Standard Office, Westminster, London; rates of expansion; results of comparison of bronze No. 11 (U. S.) with bronze No. 1 (Imperial yard); of No. 11 with bronze No. 6 (Generator); of No. 11 with cast iron B and C; tabulation of results of comparison between No. 11 and foreign standards; (7) comparison of the Troughton scale with the British bronze standard No. 11; (8) concluding statement.
1880	17	341-344	Base apparatus.—J. E. Hilgard. An account of a perfected form of the contact slide base apparatus used in the Coast and Geodetic Survey.—[Sketch 82, Figs. 1 to 8.]
1881	12	354-356	On the length of a nautical mile.—By J. E. Hilgard, Superintendent Coast and Geodetic Survey.
1881	13	357-358	On a method of readily transferring the underground mark at a base monument.—By O. H. Tittmann, Assistant.
1882	7	107-138	Description and construction of a new compensation base apparatus, with a determination of the length of two 5-metre standard bars.—By C. A. Schott, Assistant.
1882	8	139-149	Report of the measurement of the Yolo base, Cal.—George Davidson, Assistant.
1883	11	273-288	Results for the length of the primary base line in Yolo County, Cal. Measurement in 1881 by George Davidson, Assistant. Computation and discussion of results by Charles A. Schott, Assistant.
1889	6	179-197	Relation between the metric standards of length of the U. S. Coast and Geodetic Survey and the U. S. Lake Survey.—By C. A. Schott and O. H. Tittmann, Assistants. Introduction; the Committee metre; the Repsold metre of 1876; the Berlin metre No. 49, special use of; the Toise du Pérou; reasons for presenting results of comparisons; comparison of the Repsold metre of 1876 (R. M.), U. S. Lake Survey, and the Committee metre (C. M.), U. S. Coast and Geodetic Survey; description of the optical beam compass comparator; micrometers; micrometer values; illumination; thermometers; comparison of line and end metres; special device used with C. M.; two plates illustrating same; places of observation; general adjustments; discussion of results; comparison of the coefficients of expansion of the iron Committee metre (C. M.) and of the Repsold steel metre (R. M.); comparison of the Repsold metre of 1876 (or R. M.) with the Berlin metre No. 49 (or B. M.); recapitulation of resulting normal differences R. M. —B. M.; comparison of values for coefficient of expansion of the Berlin brass metre No. 40 (or B. M.); relation of the Committee metre to the Mètre des Archives and to the new International Prototype metre. Abstract of Record of Comparisons: A.—Record of comparisons between the Committee metre (C. M.) and the Repsold metre (R. M.). B.—Record of comparisons between the Berlin metre (B. M.) and the Repsold metre (R. M.); abstract of comparisons between C. M. and R. M.; abstracts of results of comparisons between C. M. and R. M.; final abstract R. M.—C. M.; abstract of results of comparisons between B. M. (No. 49) and R. M.
1889	.....	165-173	Bulletin No. 17. The relation between the metric standards of length of the U. S. Coast and Geodetic Survey and the U. S. Lake Survey. A report by C. A. Schott and O. H. Tittmann, Assistants, Coast and Geodetic Survey.

GEODESY—Continued.

BASE LINES AND STANDARDS OF LENGTH—Continued.

Year.	Appendix.	Pages.	Subject and author.
1889	10	217-231	Report on the measurement of the Los Angeles base line, Los Angeles and Orange counties, Cal., by George Davidson, Assistant. Previous base measurements at Los Angeles; search for base monuments; desirability of new base measurements; reconnoissance and examination for base-line site; preparations for the measurement; general location of the Los Angeles base line; final location of the line; building the base piers; marking the base stations; the reference or witness marks for the southeast base station; the base line leveled and preliminarily measured with 100 metre wire; half-kilometre marks and temporary marks on the base line; the movable cover for the base apparatus; the organization and movement of the party; foot plates of the trestles; comparisons of the base bars Nos. 1 and 2, and the field standard No. 2; comparisons during the base measurement; placing the forward bar in position; moving the bars into line; measure for fractional bars; the alignment of the bars; the comparators; the operation of a day's measurement; the rate of measurement of the base; tabulation of daily work; first measurement Los Angeles base line; second measurement Los Angeles base line; third measurement Los Angeles base line; summary of the statistics of the three measurements of the Los Angeles base line; exhibit of the third measurement by days. Illustrations: No. 20, Markings of ends of primary base line, Los Angeles, Cal.; No. 21, Map showing the general location of the Los Angeles base line and its connection with the main triangulation; No. 22, Profile of the Los Angeles base line; No. 23, Los Angeles base line, sketch showing movement of party.
1889	.....	45-50	Bulletin No. 9, on the relation of the yard to the metre.—By O. H. Tittmann, Assistant.
1889	.....	157-159	Bulletin No. 15, verification of weights and measures.—By O. H. Tittmann, Assistant. (One illustration.)
1889	17	479-491	Report on the resulting length and probable uncertainty of five principal base lines, measured with the Bache-Würdemann compensation base apparatus between 1847 and 1855.—By Charles A. Schott, Assistant. Introductory remarks: Part I—Resulting length and probable uncertainty of the base line measured on Dauphine Island, Alabama, in 1847—by A. D. Bache, Superintendent U. S. Coast Survey; Part II—Resulting length and probable uncertainty of the base line measured on Bodies Island, North Carolina, in 1848—by A. D. Bache, Superintendent U. S. Coast Survey; Part III—Resulting length and probable uncertainty of the base line measured on Edisto Island, South Carolina, in 1850—by A. D. Bache, Superintendent U. S. Coast Survey; Part IV—Resulting length and probable uncertainty of the base line measured on Key Biscayne, Cape Florida, in 1855—by A. D. Bache, Superintendent U. S. Coast Survey; Part V—Resulting length and probable uncertainty of the base line measured at Cape Sable, Florida, in 1855—by A. D. Bache, Superintendent U. S. Coast Survey.
1890	16	715-720	On the relation of the yard to the metre.—By O. H. Tittmann, Assistant. NOTE.—This paper is a second edition of Bulletin No. 9, revised by the author, with statement of later comparisons, confirming his results.
1892 Pt. 2	8	329-503	On the measurement of the Holton base, Holton, Ripley County, Ind., and the St. Albans base, Kanawha County, W. Va.—Prefatory Note by T. C. Mendenhall. I. Extracts from the records and from the reports of A. T. Mosman. II. The iced bar and tape base apparatus and results of measures made with them on the Holton and St. Albans bases.—by R. S. Woodward. III. The new secondary base apparatus of the Coast and Geodetic Survey as used in the measurement of the Holton base, Indiana.—By O. H. Tittmann. [Five illustrations, Nos. 30 to 34.]
1893 Pt. 2	5	125-164	On the measurement of base lines with steel tapes and with steel and brass wires.—By Edw. Jäderin. Translated by J. H. Gore. [Two illustrations, Nos. 4 and 5.]
1893 Pt. 2	6	165-172	Fundamental standards of length and mass.—By T. C. Mendenhall. NOTE.—This paper was first published as Bulletin No. 26, and is republished here to give it a more permanent form. Appended to it will be found a third edition of the tables for converting customary and metric weights and measures.
1894 Pt. 2	5	101-116	The length of the Holton base line, Indiana, with related experimental measures during part of July, August, September, and October, 1891; A. T. Mosman, Assistant, in charge of the party.—Reported by C. A. Schott.
1894	6	117-123	The length of the St. Albans base line, West Virginia, measured in October, 1892. R. S. Woodward, Assistant, Coast and Geodetic Survey, in charge of the party.—Reported by C. A. Schott.

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GEODESY—Continued.

RECONNAISSANCE.

Year.	Appendix.	Pages.	Subject and author.
1850	23	106-110	Extract from the report of Assistant F. H. Gerdes to the Superintendent on the reconnaissance of the Florida Keys, etc.
1850	31	119-120	Report accompanying a reconnaissance chart of the western coast of the United States, from Monterey, Cal., to the Columbia River, Oregon.—By Lieut. Commanding, W. P. McArthur, U. S. N., Assistant.
1851	31	488-494	Florida coast reconnaissance.—F. H. Gerdes. A, description; B, survey; C, tides and currents; D, railroad across the peninsula; E, lighthouses and buoys; F, general remarks on Cedar Keys Harbor.—[Sketches 27, 28, and 29.]
1852	12	87-94	Extracts from the report of Assistant F. H. Gerdes on a reconnaissance from Suwannee River, Florida, to Delta of Mississippi.
1852	18	104-107	Report of Lieut. Commander James Alden, U. S. N., on the reconnaissance from San Francisco to San Diego, including Santa Barbara Islands and channel.
1854	20	28-30	Extracts from the report of F. H. Gerdes on the reconnaissance of the coast of Louisiana in 1854 (Mississippi Delta).
1854	21	30-31	Extracts from a report by W. E. Greenwell on the general features and peculiarities of the coast of Lower Texas, with suggestions in regard to facilities for navigation, from the harbor of the Brazos de Santiago to the mouth of the Rio Grande.
1855	25	171-176	Florida Keys. Survey of the General Land Office, including reports on the general topography and triangulation, on the determination of the shore-line, and reconnaissance of Barnes Sound, Florida.
1856	52	286-289	Report of the Superintendent to the Commissioner of the General Land Office on progress made in the survey and marking in quarter sections.
1857	41	379-382	Florida Peninsula air-line. Report of a reconnaissance made between Fernandina and Cedar Keys.—By Capt. J. H. Simpson, United States Topographical Engineers.
1857	42	382-390	Florida Keys. Superintendent's report to Commissioner of General Land Office on progress made in survey and marking of the keys.
1857	43	390-391	Coast of Santa Barbara Channel. Report of Subassistant W. M. Johnson on its topographical characteristics.
1857	44	392-395	Santa Barbara Islands and main. Report on the character and progress of the work.—W. E. Greenwell.
1858	34	224	Eastern coast of Florida, south of St. Johns River. Report of Subassistant J. Meehan on local characteristics.
1858	35	225-227	Florida Keys. Superintendent's report to Commissioner of General Land Office on progress made in surveying and marking of the keys—Continued.
1859	32	324-328	Coast of Texas, embracing the shores of Espiritu Santo, San Antonio, and Aransas Bays. Report on a reconnaissance.—S. A. Gilbert.
1860	34	356-357	Corpus Christi Bay and Laguna Madre, Texas. General description and characteristics.—S. A. Gilbert.
1861	29	263-264	Coast of Texas above Galveston Bay. Extracts from a descriptive report.—Capt. George Bell, U. S. A.
1873	11	111-122	Geographical and hydrographical explorations on the coast of Alaska.—W. H. Dall. [Sketch No. 17.] Islands of Attu, Bouldyr, Kyska, Amchitka, Adakh, Atka, Amlia, Four Craters, Agashagok, Unalashka, Sannakh Reefs; Popoff Strait; current observations; azimuths; positions and magnetic declinations, Tables 1 to 16; thermometer mean for 1873; surface of sea water; 5 fathoms below surface-current observations made on board the Yukon during the voyage from San Francisco to Unalashka, May, 1873; heights of mountains determined in 1877.

GEODESY—Continued.

RECONNAISSANCE—Continued.

Year.	Appendix.	Pages.	Subject and author.
1885	10	469-481	On Geodetic Reconnaissance.—By C. O. Boutelle, Assistant. Primary triangulation and base lines; reconnaissance for stations of a primary triangulation; tables of values of curvature and refraction; three-point problem; two-point problem; computation of linear coordinates; selection of stations for secondary and tertiary triangulations.—[Illustrations 27, 28.]

TRIANGULATION AND INSTRUMENTS.

1855	57	361-363	Boutelle's tripod and scaffold.—C. O. Boutelle. Description of, as constructed and used by him at the stations of the primary triangulation in Section V.—[Sketch 52.]
1855	58	363-364	Farley's signal.—J. Farley. Description and drawing of a convenient signal for observing on secondary stations.—[Sketch 52.]
1855	59	364	Sand's heliotrope.—B. F. Sands. Description and drawing of a convenient signal for observing on secondary stations.—[Sketch 55.]
1856	56	291-292	Mississippi Sound.—J. E. Hilgard. Details of the work of triangulation; signals and station marks.
1856	61	310-316	Theodolite test.—J. E. Hilgard. Examination and trials made of a 10-inch theodolite, applicable to the testing of instruments of like construction.—Table I, readings of every 10° on the circle, and determination of angular distance of verniers; II, determination of eccentricity; III, residual errors of graduation and readings; figure of pivots.
1860	35	357-361	Repeating theodolite. Supplement to the method of testing (described in the preceding paper.)—Table I, readings of every 10° on the circle and determination of angular distance of verniers; II, determination of eccentricity; III, residual errors of graduation and readings.
1867	9	140-144	Railways, on the use of, for geodetic surveys.—J. E. Hilgard. Wheel records; linear measurement; rectification of curves; reduction of the measured lines and angles to a simpler system.—[Sketch 26.]
1867	10	145	Reflector.—J. E. Hilgard. Description of a new form of geodetic signals.—[Sketch 26.]
1868	7	109-139	Memoranda relating to the field work of a secondary triangulation.—R. D. Cutts. Selection of stations; names of stations; signals; tripods and scaffolds; underground station marks; surface station marks; observations and records; number of observations; limit of error; probable error; reduction to center; correction for phase; correction for eccentricity; spherical excess; distribution of error; trigonometrical leveling; coefficient of refraction; three-point problem; rectangular coordinates; measurements of subsidiary base lines; records, duplicates, and computations.
1868	8	140-146	Method of adjustment of the secondary triangulation of Long Island Sound.—C. A. Schott. Example of reduction of angular measure of Shelter Island; final computation and proof of correctness.
1871	15	185-188	Adaptation of triangulations to the various conditions of configuration and character of the surface of country and other causes.—C. A. Schott.
1873	13	137	Intervisibility of stations.—J. E. Hilgard.
1874	15	153	Improved clamp for telescope of the theodolite.—George Davidson.
1875	17	279-292	Method of closing a circuit of triangulation under certain conditions.—C. A. Schott, M. A. Doolittle. Illustrations.
1876	20	391-399	Adaptation of triangulations to various conditions, depending on the configuration or orthographic character of a country and on the degree of accuracy aimed at, with due consideration of the time and means available; also notes on the method of observing horizontal angles and directions in geodetic surveys.—C. A. Schott. [Reported, with additions, from Report for 1871, Appendix No. 15.]

GEODESY—Continued.

TRIANGULATION AND INSTRUMENTS—Continued.

Year.	Appendix.	Pages.	Subject and author.
1877	11	114-147	An examination of three new 20-inch theodolites.—J. E. Hilgard. Examination of No. 113; of Nos. 114 and 115; subdivisions on limb of No. 114; of No. 115; example of record; graphic projection of $\epsilon \sin (r-\rho)$; examination of limb of No. 114; Tables I, II, III (first set); Tables I, II, III (second set); Tables I, II, III (third set); residual errors of graduation and reading; examination of limb of No. 113; Tables I, II, III (first set); Tables I, II, III (second set); Tables I, II, III (third set); residual errors of graduation and reading; examination of limb of No. 115; Tables I, II, III (first set); Tables I, II, III (second set); Tables I, II, III (third set); residual errors of graduation and reading; examination of limbs of 20-inch theodolites with reference to periodicity of errors within 5°; specimen of record (No. 114); mean value of 5′ spaces; of degrees.
1877	13	182	Improved open vertical clamp for telescopes of theodolites and meridian instruments.—George Davidson.
1877	.....	45	Field work of the triangulation.—By R. D. Cutts, Assistant. [Reprinted, with additions, from the Coast Survey Report for 1868.]
1878	8	92-118	Primary triangulation between the Maryland and Georgia base lines.—C. A. Schott. Arrangement of errors in closing triangles, in tabular form; average probable error. Paper 1. Adjusted primary triangles between Kent Island, Maryland, and Atlanta, Ga.; (2) estimation of the probable accuracy of a triangulation or approximate determination of the average probable error of the adjusted differences; (3) paper by M. H. Doolittle; I, general method of solution of normal equations; II, addition of new equations; III, order of solution; IV, selection of angle equations; V, treatment of small angles; example.
1880	8	96-109	Geodetic night signals.—C. O. Boutelle. Considerations; different kinds of lights; conditions of the problem; *experiments in North and South Carolina; operations at Sugar Loaf* Mountain in 1879; method of observing; comparison of day and night observations; additional expense in using night signals; offsets to the expense; conclusions; sketches Nos. 36, 37.
1882	9	151-197	Field work of the triangulation, third edition.—R. D. Cutts, Assistant.
1882	10	199-208	On the construction of observing tripods and scaffolds.—C. O. Boutelle, Assistant.
1884	8	377-385	The run of the micrometer.—By George Davidson, Assistant. Explanation of the expression in reference to an astronomical or geodetic instrument; conditions when a micrometer has and when it has not a run; discussion of formulæ for the determination of run, with examples; tabulation of the micrometer runs observed at station Northwest Yolo Base; tables of the corrections for the "run of microscope micrometers."
1884	9	387-390	Connection at Lake Ontario of the primary triangulation of the Coast and Geodetic Survey with that of the Lake Survey.—Observations by Charles O. Boutelle, Assistant. Discussion by Charles A. Schott, Assistant. Probable errors of the horizontal directions of the Coast and Geodetic Survey; summary of resulting directions at Mount Hamilton; differences in the linear values of the lines Sodus-Oswego, Victory-Oswego, and Clyde-Victory; differences in the longitudes and latitudes of the stations Sodus and Oswego, and differences in the azimuth of the line Sodus to Oswego, as determined by the Coast and Geodetic Survey and the Lake Survey; comparisons of the mean error of an angle as determined by each survey; junction in Illinois of the Coast and Geodetic Survey; transcontinental triangulation (through Assistant Fairfield's field computation) and the Lake Survey arc of the meridian, vicinity of the Olney base.—[Illustration 20.]
1885	9	441-467	Results deduced from the geodetic connection of the Yolo base line with the primary triangulation of California; also a reduction and adjustment of the Davidson quadrilaterals, forming part of that triangulation.—By Charles A. Schott, Assistant. Prefatory note; sketch of Yolo base connections; description of instruments used and method of observation; abstract of the horizontal directions resulting from the local adjustment at each of the stations composing the Yolo base net of triangulation; determination of weights to directions in the adjustment of the triangulation; table of closing errors of the triangles forming the Yolo base figure, arranged in the order of the size of the triangles with the probable error

GEODESY—Continued.

TRIANGULATION AND INSTRUMENTS—Continued.

Year.	Appendix.	Pages.	Subject and author.
			of a direction; adjustment of a triangulation net or of conditioned observations; application to the adjustment of the Yolo base net; correlative equations; normal equations Yolo base net with solutions; determination of the probable error of the adjusted length of the primary side, Mount Helena to Mount Diablo; triangle side computation; formulæ for the computation of geodetic latitudes, longitudes, and azimuths sufficiently precise for sides of the largest triangles that may be directly measured; determination of standard geodetic data for the computation of geographical positions; geodetic or standard latitude of Mount Helena, and geodetic or standard azimuth of direction, Mount Helena to Mount Diablo, for the Davidson quadrilaterals, geodetic results of the Davidson quadrilaterals, introducing the Yolo base into the primary triangulation of California.
1892 Pt. 2	9	505-513	Measure of the irregularity in one turn of the micrometer screw, and the relative value of each turn.—A report by George Davidson. [One diagram.]
1894 Pt. 2	8	263-275	Notes on some instruments recently made in the Instrument Division of the Coast and Geodetic Survey Office.—Prepared by Edwin Smith. [Four illustrations, Nos. 7 to 10.]
1896	6	285-291	Establishment of the United States Naval Observatory Circle, and the determination of the geographical position of the center of the clock room.—By E. D. Preston, Assistant. [Four illustrations.]

TIME.

1854	39	121	Discussion of probable error of observation with a Würdemann 26-inch portable transit; from observations by G. Davidson in 1853. [Report of 1866, Sketch 29.]—J. E. Hilgard.
1865	15	152-154	Report, with tables, on the declinations and proper motions in declination of standard time stars.—B. A. Gould.
1865	16	155-159	Report, with tables, of the positions and proper motions of the four polar stars.—B. A. Gould.
1866	9	55-71	The transit instrument, description, use, adjustment, and method of observation.—C. A. Schott.
1867	8	138-139	New meridian instrument for time, latitude, and azimuth.—George Davidson.—[Sketch 28.]
1868	10	154-157	Addenda to Appendix No. 9, Coast Survey Report for 1866, on the determination of time by means of the transit instrument.—C. A. Schott.
1869	12	226-232	On the use of the zenith telescope for observations of time, with an example of observation.—J. E. Hilgard.
1872	12	222-226	Determination of weights to be given to observations for determining time with portable transit instrument, recorded by the chronographic method.—C. A. Schott. Relative weights to transits depending on the star's declination; relative weights to incomplete transit observations; reduction of observations for time.
1872	18	266	Improvement on the Hipp chronograph.—William Eimbeck.
1874	17	156-159	Two forms of portable personal equation apparatus.—J. E. Hilgard. Examples of observations; observations for absolute personal equation; diagrams.
1874	.....	32	Field catalogue of 983 stars, for time observations; mean places for 1870.—George Davidson.
1874	.....	69	Star factors A, B, and C, for reducing transit observations.—George Davidson.
1875	15	249-250	Description of an apparatus for recording the mean of the times of a set of observations. (Diagram.)—C. S. Peirce.
1877	13	182, 183	Improved open vertical clamp for telescopes of theodolites and meridian instruments.—George Davidson.

GEODESY—Continued.

TIME—Continued.

Year.	Appendix.	Pages.	Subject and author.
1879	7	103-109	Description of the Davidson meridian instrument.—George Davidson. See Appendix No. 8, report of 1867, for first printed description.
1880	14	205-227	Determination of time by means of the transit instrument. (Four plates.)—C. A. Schott. General remarks; description; adjustment; method of observation; equatorial intervals of threads; incomplete transits; corrections for rate of chronometer, for inclination, for inequality of pivots, for collimation, for deviation, for diurnal aberration; personal equation; chronometer correction; reduction of observations by least squares; probable error; example; weights; preparation for observing transits; example of record and computation of inequality of pivots; specimen of record for value of level by level-trier; tabulation of factors; table of factors for reduction of transit observations.
1883	18	383-472	Field catalogue of 1278 time and circumpolar stars; mean places for 1885·0.—By George Davidson, Assistant.
1885	15	503-508	Note on a device for abbreviating time reductions.—By C. S. Peirce, Assistant.
1889	9	213-216	Description of two new portable transits for longitude work.—By Edwin Smith, Assistant. One illustration. (Published also as Bulletin No. 16.)
1896	9	347-352	Field method of reducing portable transit time observations.—By G. R. Putnam, Assistant.

LATITUDE.

1852	.....	16	Notes on the use of the zenith telescope in determining latitudes in the Coast Survey by Talcott's method, and on the reduction of the observations, by A. D. Bache, Superintendent U. S. Coast Survey. (From the American Journal of Science and Arts, Vol. XIV, second series, New Haven, 1852.)
1855	44	276-278	Description of Würdemann's zenith telescope of 1855, used at Dixmont, Me.—G. W. Dean.
1857	31	324-334	Latitude.—On the method of determination with the zenith telescope.—C. A. Schott. Principle of the method; determination of value of micrometer—examples; determination of value of level—example; correction for refraction—example; reduction to meridian—tables; selection of stars; sources of error in the determination of the value of micrometer; method of correcting value from the latitude observations themselves; discussion of the results of observation—example.
1858	20	184-186	Personal equation.—A. D. Bache. On the use of the zenith telescope for determining latitude by Talcott's method—table showing results of observations for personal equation.
1865	17	160-165	Report on the latitude of Cloverden station in Cambridge.—B. A. Gould. Micrometer values; reduction of star observations—tables; discrepancies with uncorrected catalogue places—table; resultant mean places of stars, etc.—table; deduced places for Cloverden station—table; mean error; other determinations.
1866	10	72-85	Latitude by the zenith telescope.—C. A. Schott. (1) General remarks on Talcott's method; (2) modification of instrument; (3) description; (4) adjustment; (5) selection of stars for observation; (6) directions for observing; (7) off the meridian; (8) general expression for the latitude; (9) determination of the value of a division of micrometer; (10) of level; (11) correction for differential refraction; (12) reduction to the meridian; (13) record of the observations; (14) reduction of the observations; (15) discussion of the results; (16) combination of the results by weight.—Examples to articles 9, 10, 13, and 14.—[Sketch 28.]
1867	8	138-139	New meridian instrument for time, latitude, and azimuth.—George Davidson.—[Sketch 28.]
1873	14	138	List of stars for latitude observations.
1876	7	83	A catalogue of stars for latitude observations.

GEODESY—Continued.

LATITUDE—Continued.

Year.	Appendix.	Pages.	Subject and author.
1877	13	182–183	Improved open vertical clamp for telescopes of theodolites and meridian instruments.—George Davidson.
1879	7	103–109	Description of the Davidson meridian instrument.—George Davidson. See Appendix No. 8, Report of 1867, for first printed description.
1880	14	245–250	Latitude determination by means of the zenith telescope.—C. A. Schott. (1) General remarks on Talcott's method; (2) modification of instrument; (3) description; (4) adjustment; (5) selection of stars; (6) directions for observing; (7) bisection of stars off the meridian; (8) general expression for latitude; (9) determination of value of micrometer; (10) determination of value of level; (11) differential refraction; (12) reduction to the meridian; (13) form of record; (14) of reduction; (15) discussion of results; (16) combination of results by weights.—Examples to articles 9, 10, 13, and 14.
1888	13	465–470	Differential method of computing the apparent places of stars for determinations of latitude. By E. D. Preston, Assistant.
1888	14	471–563	Determinations of latitude and gravity for the Hawaiian Government. By E. D. Preston, Assistant. [For abstract of contents see under "Gravity."]
1889	.....	137–142	Bulletin No. 11.—An abstract of above paper published in advance of the appearance of the full paper in the report for 1888.
1891 Pt. 2	13	479–485	On observations for the variations of latitude, made near Honolulu, Oahu, Hawaiian Islands, in cooperation with the work of the International Geodetic Association, and on determinations of gravity and magnetic elements.—A preliminary report by E. D. Preston.
1891 Pt. 2	14	487–501	Report of an expedition to Muir Glacier, Alaska, with determinations of latitude and the magnetic elements at Camp Muir, Glacier Bay.—By H. F. Reid. [One illustration, No. 22.]
1892 Pt. 2	1	1–51	On the variation of latitude at Rockville, Md., as determined from observations made in 1891 and 1892, in cooperation with the International Geodetic Association.—Prefatory note by T. C. Mendenhall. I. Description of the station, instruments, and methods of observing, by Edwin Smith. II. Reductions of the observations and discussion of the results, by C. A. Schott. [Four illustrations, Nos. 1 to 4.]
1892 Pt. 2	2	53–159	On the variation of latitude at Waikiki, near Honolulu, Hawaiian Islands, as determined from observations made in 1891 and 1892 in cooperation with the International Geodetic Association.—By E. D. Preston. [Fourteen illustrations, Nos. 5 to 18.]
1893 Pt. 2	11	440–508	On the variation of latitude at San Francisco, Cal., from observations made in concert with the International Geodetic Association, 1891 and 1892.—Observations by George Davidson. Discussion and report by C. A. Schott. [Two illustrations, Nos. 20 and 21.]
1893 Pt. 2	12	509–638	Determinations of latitude, gravity, and magnetic elements at stations in the Hawaiian Islands, including a result for the mean density of the earth, 1891, 1892.—Report by E. D. Preston. [Sixteen illustrations, Nos. 22 to 37.]
1895 Pt. 2	2	321–346	Abstract of resulting latitudes of some prominent stations in Alaska and adjacent parts as astronomically determined during 1889–1895.—By C. A. Schott.
1896	10	353–371	Determination of the constant of aberration from latitude observations with the zenith telescope at Honolulu, Hawaiian Islands, and San Francisco, Cal.—Report by E. D. Preston, Assistant. [Two illustrations.]

LONGITUDE.

1846	10	71–72	Differences of longitude of Philadelphia and Greenwich, by reduction of observations at Cambridge, Mass.—S. C. Walker.
1846	11	72–74	Differences of longitude by telegraph.—S. C. Walker. Correction for personal equation.

GEODESY—Continued.

LONGITUDE—Continued.

Year.	Appendix.	Pages.	Subject and author.
1848	.....	6	Letter from Professor Bache to the editor of the Astronomische Nachrichten, dated at Washington, February 7, 1848, and communicating a report of Prof. Sears C. Walker, of November 10, 1847, on the results obtained in the survey of the coast of the United States for differences of longitude by the electro-magnetic telegraph.—Prof. Schumacher's Astronomische Nachrichten, No. 632.
1848	4	78-83	Recapitulation of results for personal equation, 1844-1848.—S. C. Walker.
1848	19	112-118	Longitude computations.—S. C. Walker.
1848	.....	13	Letter of A. D. Bache, Superintendent U. S. Coast Survey, to the Secretary of the Treasury, dated December 26, 1848, communicating a report by S. C. Walker, on an application of the galvanic circuit to an astronomical clock and telegraph register in determining local differences of longitude and in astronomical observations generally. [House Ex. Doc. No. 21, Thirtieth Congress, second session.]
1849	5	72-78 74	Mechanical record of astronomical observations.—Prof. O. M. Mitchel. Revolving disk; arrangement for recording differences of declinations.
1850	6	79	Differences of longitude between Cambridge and Liverpool observatories.—W. C. Bond.
1850	13	85-89	Telegraphic operations and computations.—S. C. Walker. I. Experiments for galvanic wave time between Washington and St. Louis; II, attempted experiments on wave time through different conductors; III, experiments with the chemical telegraph line; IV, progress of the researches on the velocity of the galvanic current; the Bond spring governor.
1851	18	462-463	Telegraphic arrangement to determine the difference of longitude between Cambridge and Halifax.—S. C. Walker.
1851	25	476-479	Measures of wave time, made from 1849 to 1851.—S. C. Walker. Specifications and tables of results.
1851	26	480-481	Abstract of reports on longitudes.—S. C. Walker. By moon culminations, eclipses, transits, occultations, and telegraph.
1853	31	84	On longitude from moon culminations.—Benjamin Peirce. On the determination of longitude from observation of moon culminations; standard probable error of observation of interpolated lunar transits; constant errors of epoch and periodical one of half lunations.
1853	32	84-86	On moon culminations observed by the "American method," with remarks on the performance of Bond's spring governor.—W. C. Bond. Comparison of records made by two spring governors differing one-tenth of a second in time of vibration of their respective pendulums; table of star transits; amount of probable errors.
1853	33	86-88	Telegraphic longitude of Charleston, S. C.—B. A. Gould. Results of observations for the determination of difference of longitude by telegraph between Seaton station (Washington, D. C.) and Charleston, S. C.
1853	.....	88-89	Cambridge and Liverpool chronometer expeditions in 1849, 1850, and 1851.—G. P. Bond. Computations of results for determining difference of longitude.
1854	36	108-120	Longitude by moon culminations.—Benjamin Peirce. General considerations; constant errors and personal equations; correction of the lunar ephemeris; standard probable error of observation of a lunar transit; limit of accuracy attainable; longitude of the National Observatory, Washington, D. C.; three forms of correcting lunar ephemeris and the modes of computation.—[Errata, 112, 113, 114, 115, 117; 1855, p. xix.]
1854	37	120	Moon culminations.—W. C. Bond. Observed by the American method; chronometric longitude of Cambridge and probable error.
1854	38	120	Moon culminations.—E. O. Kendall. Observed at High School Observatory, Philadelphia.
1854	39	121	Discussion of probable error of observation with a Würdemann 26-inch portable transit. From observations by G. Davidson in 1853. [See illustration No. 29—Report 1866.]—J. E. Hilgard.

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LONGITUDE—Continued.

Year.	Appendix.	Pages.	Subject and author.
1854	41	128-131	Telegraphic longitude.—B. A. Gould. On telegraphic observations for the difference of longitude between Raleigh, N. C., and Columbia, S. C.
1854	42	138-142	Chronometric longitude expeditions (Cambridge-Liverpool).—G. P. Bond. Results of the expeditions of 1849, 1850, and 1851, and on the method of computation.—[Errata, 140: 1855, p. xix.]
1855	42	267-274	Longitudes.—Report on the method of determining longitudes by occultations of the Pleiades.—Benjamin Peirce. [Errata, 268, 269, 270, 272, 273: 1855, p. xviii.]
1855	43	275-276	Chronometric longitudes.—W. C. Bond. On moon culminations observed by him, and the chronometric expedition for determining the longitude difference between Cambridge, Mass., and Liverpool, England.—[Errata, 275: 1855, p. xviii.]
1855	46	286-295	Telegraphic longitudes.—B. A. Gould. Report on telegraphic operations for difference of longitude between Columbia, S. C., and Macon, Ga.; programme of telegraphic campaign; for instrumental corrections and longitude reductions; battery memoranda; to put up Kessel's clock.—[Errata, 288: 1855, p. xviii.]
1856	20	163-166	Telegraphic longitudes.—B. A. Gould. Operations for difference of longitude between Wilmington, N. C., and Montgomery, Ala., with list of stars for observation.
1856	21	167-181	Telegraphic method of determining differences of longitude.—G. W. Dean. Details of the method used in the Coast Survey for telegraphic determinations of difference of longitude; transit instrument; astronomical clock; chronographic register; batteries; list of stars arranged from the British Association Catalogue for determining the difference of longitude between Macon, Ga., and Montgomery, Ala., March, 1856; exchange of star signals; reading off the chronographic sheets; example of reduction; observations for determining the inequality of the pivots of Coast Survey transit No. 8; personal equations. (Sketch 66.)—[Errata, 169-170: 1856, p. xx.]
1856	22	181	Chronometric and astronomical longitudes.—W. C. Bond. On longitude computations and occultations observed; lunar-spot transits.
1856	23	182-191	Chronometric results.—G. P. Bond. Results of the chronometric expeditions of 1849, 1850, 1851, and 1855 for difference of longitude between Cambridge, Mass., and Liverpool, England; table of longitudes by voyages of 1855.
1856	24	191-197	Pleiades.—Benjamin Peirce. On the determination of longitude by occultations of the Pleiades; formulas for the correction of the coordinates of the stars; table for 1840; table of logarithms for h and k for the principal observatories.
1856	25	198-203	Lunar-spot transits.—C. H. F. Peters. On the substitution of lunar spots for the moon's limb in observing culminations.
1856	26	203-208	Occultations on the western coast.—G. Davidson. Observations made at Port Townsend, Wash. Ter., April and May, 1856; tables and remarks.
1857	27	305-310	Telegraphic longitudes.—On the progress made in the different campaigns.—B. A. Gould. List of time-stars adopted; difficulties and discrepancies of transmission for signals between Wilmington, N. C., and Columbia, S. C.
1857	28	310, 311	Moon-culminations.—W. C. Bond. On the number observed during the year at Cambridge, cooperative with those on the Pacific side; star-occultation photographs; connection with Quebec.
1857	29	311-314	Longitude methods.—Benjamin Peirce. On the relative precision of determinations by occultations and solar eclipses; upon the use of the solar eclipses; upon the occultations of the Pleiades.
1857	30	314-324	Chronometric determination of the difference of longitude between Savannah, Ga., and Fernandina, Fla., and discussion of the method.—A. D. Bache and C. A. Schott. Chronometers used; personal equation; temperature compensation; chronometer comparisons—table; stationary and traveling rates; tables of comparison and discussion.

GEODESY—Continued.

LONGITUDE—Continued.

Year.	Appendix.	Pages.	Subject and author.
1858	21	186-189	Longitudes.—Method of computing from moon-culminations; notes on observations of moon-culminations; forms and example.
1858	23	190	Moon-culminations, etc.—O. M. Mitchel. Number of observations made by him for the Coast Survey.
1859	21	278	Moon-culminations.—O. M. Mitchel. Observations made for the Coast Survey at the Cincinnati Observatory for longitude purposes.
1861	16	182-195	Longitude.—Benjamin Peirce. Discussion of observations of the solar eclipse of July, 1851; observations of the total phase; European observations, of which the beginning and the end, both observed at the same place, have been admitted into the computation; American observations; method of computation.
1861	17	196-221	Report on the determination of longitude by occultations of the Pleiades, with an example showing the mode of computation; Greenwich, Cambridge (England), Ashurst, Washington City, Philadelphia, and Boston observatories computed; solutions of the equations for the correlation of the moon's place and of the longitude.
1861	18	221-232	Longitude of Albany, N. Y.—B. A. Gould. Abstract of a report on the determination by telegraph of the difference of longitude between New York City and Albany; table of instrumental corrections; collimation and azimuth correction, and hourly clock-rate; personal equations; comparative table of longitude results at the two stations.
1862	12	155, 156	Longitude of America from Europe.—Benjamin Peirce. On the result from occultations of the Pleiades.
1862	13	157, 158	Lunar tables used in reducing observations of the Pleiades for longitude.—Benjamin Peirce. On their progressive improvements.
1862	14	158-160	Longitudes in Maine, Alabama, and Florida.—B. A. Gould. On progress in computing results from telegraphic observations.
1863	17	146-154	Occultations of the Pleiades in 1841-'42.—Benjamin Peirce. On computations for longitude, Nos. I, II, and V; records of Edinburgh, Washington, and Cambridge observations; ephemeris; stereographic coordinates of the moon referred to Alcyone; equations for the correction of the moon's place and of the longitude; solutions.
1863	18	154-156	Longitude.—B. A. Gould. On computations connected with the telegraphic method.
1863	23	205	Induction-time in relay-magnets.—G. W. Dean. Report on experiments made to determine their relative power.
1864	11	114	Longitude.—Benjamin Peirce. On the method of determining longitudes by occultations of the Pleiades.
1864	12	115, 116	On results by telegraphic method.—B. A. Gould.
1864	20	211-220	Eduction time of relay magnets, deduced from experiments.—G. W. Dean.
1865	12	138-146	Report on the progress of determining longitude from occultations of the Pleiades, continued from previous reports.—Benjamin Peirce. Values of Σ_2-p for 1838-1842 and 1857-1861.
1865	13	146-149	Method of determining longitude from the occultations of the Pleiades, continued from previous reports.—Benjamin Peirce. Corrections of lunar semidiameter, mean place, ellipticity of orbit, longitude of perihelion, coefficient of annual parallax, and longitude of Europe and America; example.
1865	14	150, 151	Report on the results of determining longitude by telegraphic method.—B. A. Gould.
1866	9	55-71	The transit instrument, description, use, adjustment, and method of observation.—C. A. Schott.
1866	12	99, 100	Longitude.—[From Report for 1846.]—S. C. Walker. Difference of longitude between Philadelphia and Greenwich by reduction of Cambridge (Mass.) observations.
1866	13	100-102	Longitude.—[Report for 1846.]—S. C. Walker.

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LONGITUDE—Continued.

Year.	Appendix.	Pages.	Subject and author.
1866	14	102-105	Longitude.—[From Report for 1848.]—S. C. Walker. Difference of longitude between New York, Cambridge, and Greenwich.
1866	15	106-108	Longitudes.—[From Report for 1850.]—S. C. Walker. (1) Experiments for galvanic-wave time between Washington, D. C., and St. Louis, Mo.; (2) attempted experiments on wave time through different conductors; (3) experiments with the chemical telegraph line; (4) progress of the researches on the velocity of the galvanic current.
1866	16	109-111	Galvanic-wave time.—[From Report for 1851.]—S. C. Walker. On measurements from 1849 to 1851, with tables.
1866	17	111, 112	Longitudes.—[From Report for 1851.]—S. C. Walker. Abstract of reports on longitudes, by moon culminations, by eclipses, transits, and occultations, by chronometer expeditions, and by telegraphic operations.
1867	6	57-133	On the longitude between America and Europe from signals through the Atlantic cable.—B. A. Gould. (1) Origin of the Coast Survey expeditions in 1865 and 1866; (2) previous determinations of transatlantic longitudes from eclipses and occultations; from moon culminations; from chronometers transported from Boston to Liverpool; (3) history of the expedition of 1866; programme of transatlantic-longitude campaign; (4) observations at Valencia; table of equatorial intervals; table of observations, October 25 to November 16, 1866; (5) observations at Newfoundland, October 25 to December 16, 1866; (6) observations at Calais, December 11 to 18, 1866; (7) longitude signals between Foilhommerum and Hearts Content; clock corrections, transatlantic longitude and transmission time, October 25 to November 9, 1866; (8) longitude signals between Hearts Content and Calais; tables of Newfoundland and Calais signals; tables of longitude and times of transmission; (9) personal error in noting signals; (10) personal equation determining time; (11) final results for longitude; (12) velocity of transmission; cables of 1865 and 1866; tables of comparison. [Published also by the Smithsonian Institution, Washington, 1869.]
1870	12	100	Results of the telegraphic determination of the longitude of San Francisco, Cal.
1870	13	101-106	Abstracts of results for difference of longitude between Harvard Observatory, Massachusetts, the Coast Survey station, Seaton, and the Naval Observatory, Washington, D. C., as determined by means of the electric telegraph in 1867 by the U. S. Coast Survey, with the co-operation of Prof. Joseph Winlock, Director of Harvard Observatory, and Commodore B. F. Sands, U. S. N., Superintendent Naval Observatory.
1872	13	227-234	Preliminary report on the determination of transatlantic longitudes.—J. E. Hilgard. Brest, Greenwich, Paris; results of observation for personal equation; longitudes; Brest-Greenwich, Brest-Paris, Greenwich-Paris; Brest-St. Pierre-Cambridge; Harvard Observatory-Greenwich; Washington-Greenwich; Washington-Paris.
1873	.....	437-477	On the determination of transatlantic longitudes by means of the telegraphic cables.—By Prof. Joseph Lovering, of Harvard College. Smithsonian Contribution to Knowledge, No. 223.
1874	18	163-277	Transatlantic longitudes.—J. E. Hilgard. Final report on the determination of 1872, with a review of previous determinations. Part I—Section I, Cambridge; II, St. Pierre; III, Brest; IV, Paris-Greenwich; V, Cambridge-St. Pierre; VI, St. Pierre-Brest; programme for cable exchanges; VII, personal error in noting cable time signals; VIII, wave time of cable signals; IX, Brest-Paris and Brest-Greenwich; X, personal equation, Blake-Folain; XI, personal equation, Blake-Greenwich standard observer, and longitude Greenwich-Paris; XII, personal equation of Coast Survey observers; XIII, flexure of transit axis; XIV, final discussion of the results for longitude differences, Brest, Greenwich, Paris; XV, final combination of the longitude differences deduced from the observations of 1872, 1870, and 1866; finally adopted longitudes from observations of 1866, 1870, and 1872.
		182	Part II—Reduction of the observations made for the transatlantic longitude determination of 1872; computation of observations for clock and instrumental corrections at Cambridge, Mass., 1872; Cambridge clock corrections, from stars of less than 65° N. declination; computation of observations for clock and instrumental correction at St. Pierre, Miquelon, 1872; St. Pierre clock corrections, from stars of less

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LONGITUDE—Continued.

Year.	Appendix.	Pages.	Subject and author.
			than 65° N. declination; adopted clock corrections, Cambridge and St. Pierre at the epochs of exchanging longitude signals; table of such clock corrections and rates at St. Pierre as relate to the longitude determination with Brest; computation of observations for clock and instrumental corrections at Brest, Paris, and Greenwich; adopted chronometer corrections from all stars south of 60° N. declination; errors and rates of the sidereal standard clock of the Royal Observatory at Greenwich, connected with the longitude differences, Greenwich-Brest and Greenwich-Paris; computation of observations for clock and instrumental corrections of the National Observatory at Paris, France, relating to the differences of longitude, Paris-Brest and Paris-Greenwich; observations for inclination of axis of the Gambey meridian transit; azimuths of the meridian mark; observations on α, δ, and λ Ursæ Minoris; coefficients employed in the reduction of the observations; observations made with the Gambey meridian transit for difference of longitude, Paris-Brest; clock corrections and hourly rates at Paris; observations with the Gambey meridian transit and the Morse-Digney chronograph for difference of personal equation of Blake-Folain; clock corrections and hourly rates at Paris; observations with the Gambey meridian transit for difference of longitude, Paris-Greenwich; clock corrections and hourly rates at Paris; results of telegraphic time signals exchanged between Cambridge and St. Pierre; between St. Pierre and Brest; between Brest and Paris; between Brest and Greenwich; between Greenwich (Coast Survey transit) and Paris; personal error in noting cable time signals at St. Pierre; at Brest; difference of personal equation of Folain and Blake; Criswick and Blake; personal equation; Goodfellow, Blake, and Smith; observations for personal equation at Cambridge, Mass., October and November, 1872; results. [Errata pp. 163, 164, 167, 168, 169, 172, 173, 177, 178, 180, 207, 237, 242.]
1875	9	139-155	Telegraphic longitude of Key West.—C. A. Schott. Introduction; description of observing stations and of instrumental outfit; relative personal equations; equatorial interval of wires of transit circle; adopted mean places in right ascension of stars observed at Washington and Key West; probable error of clock corrections; *reduction of transits for clock corrections, Washington; conditional* and normal equations; synopsis of results for correction and rate of clock; reduction of transits for chronometer corrections, Key West; normal equations for azimuth and chronometer corrections; synopsis of results for correction and rate of chronometers; telegraphic connection and exchange of time signals; telegraphic difference of longitude, Washington-Key West; resulting longitude of Key West and of light-houses in its vicinity.
1880	6	81-92	Telegraphic longitudes.—C. A. Schott. Report on the results of telegraphic longitudes determined by the Coast and Geodetic Survey up to the present time, and preliminary adjustment by least squares; two groups; specimen of the first group; Atlanta and Washington; results for difference of longitude; review of the telegraphic longitude work; published results; method of combining results; table of results of differences of longitude; table of results determining subordinate stations; combination and adjustment of observed differences of longitude; diagram No. 33, conditional equations; resulting adjusted longitudes (west of Greenwich).
1880	7	93-95	Telegraphic longitudes.—Edwin Smith. Explanation of apparatus used for observation; description; cases 1 to 5; adjustments; interchange of signals; diagrams Nos. 34 and 35.
1880	14	231-241	Determination of longitude by means of the electric telegraph (two plates).—C. A. Schott. (1) Telegraphic determination of longitude; (2) personal equation; specimen of record of results for difference of longitude; variability in personal equation; (3) weights to transit observations recorded on the chronograph; weights depending on the star's declination; weights to incomplete transits; reduction of observations for time; *(4) disposition of telegraphic instruments* in the observatory; arrangements I to VI; (5) concluding remarks.
1884	11	407-430	Longitudes deduced in the Coast and Geodetic Survey from determinations by means of the electric telegraph, between the years 1846 and 1885. Second adjustment.—By Charles A. Schott, Assistant. Prefatory note; comparison of the state of the longitude work of the Survey in 1890 with that of 1885; growth of the work, with an account of its gradual development in the Survey; explanatory remarks to the table of results; Table I, general table of results for differences of longitude of stations, determined by the U. S. Coast and Geodetic Survey,

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GEODESY—Continued.

LONGITUDE—Continued.

Year.	Appendix.	Pages.	Subject and author.
			by means of the electric telegraph, between the years 1846 and 1884 (July); Table II, observed differences of longitude, their probable errors, numbers for reciprocal of weights, and symbolic corrections; degree of accuracy attained by the Survey of late years; adjustment of results by least squares; form of the conditional equations; reduced conditional equations to be satisfied; scheme of coefficients and of inverse weights for the formation of normal equations and for computing the corrections expressed in terms of the correlatives; normal equations; values of C_1 and of δ_1; final values, λ, of longitudes from Greenwich, in accordance with a decision of the International Meridian Conference, held at Washington, October, 1884; comparison of results with those of first adjustment of 1880; tables of longitudes, λ, of the remaining stations, arranged by States and Territories, in alphabetical order; computation of probable errors of adjusted longitudes; determination of the probable errors of the resulting longitudes of Washington, U. S. Naval Observatory, and of Cambridge, Harvard College Observatory; longitude of Detroit, Mich.; comparison of the U. S. Coast and Geodetic Survey result with the longitude used by the U. S. Lake Survey; longitude of Ogden, Utah; comparison of the U. S. Coast and Geodetic Survey result with the value adopted by the U. S. Engineers; junction of the American and European systems of longitudes, with diagram showing connections adjusted.—[Illustration 21.]
1889	.....	147-150	Bulletin No. 13.—Telegraphic determination of the longitude of Mount Hamilton, Cal. Field work by C. H. Sinclair, assistant, and R. A. Marr, Subassistant. Report by Charles A. Schott, Assistant.
1889	.....	161-164	Bulletin No. 16.—Description of two new transit instruments for longitude work.—Constructed at the office of the Survey from designs by Edwin Smith, Assistant. (One illustration.)
1889	8	209-212	Telegraphic determination of the longitude of a station on Mount Hamilton, Cal., and its trigonometrical connection with the Lick Observatory. Field work by C. H. Sinclair, Assistant, and R. A. Marr, Subassistant. Report by Charles A. Schott, Assistant.
1889	9	213-216	Description of two new portable instruments for longitude work.—Constructed at the office of the Survey from designs by Edwin Smith, Assistant. (One illustration.)
1893	4	117-124	On photography as applied to obtain an instantaneous record of lunar distances for determinations of longitude.—By C. Runge. Translated by J. A. Flemer.
1895	3	333-344	Abstract of resulting longitudes of some prominent stations in Alaska and adjacent parts, as astronomically determined during 1889-1895.—By C. A. Schott.

AZIMUTH.

1856	27	208-209	Azimuth.—J. E. Hilgard. Method of using the transit instrument for azimuth observations; form of record and reduction.
1866	11	86-99	Astronomical azimuth.—C. A. Schott. (1) Principal methods; (2) astronomical azimuth; (3) geodetic azimuth; (4) primary and secondary azimuths; (5) time; (6) instruments used; (7) azimuth marks; (8) errors eliminated; (9) circumpolar stars used; (10) high stars; (11) sets of observations; (12) method of recording and reducing; (13) observations of a close circumpolar star near its elongation; (14) at any hour angle; (15) computation by fundamental trigonometrical formula; (16) by Napier's analogies; (17) by a development into a series; (18) at equal intervals before and after culmination; (19) observation of sun for azimuth; (20) examples of records and reductions to articles 11, 13, 14, 15, 17, 18, and 19.—[Sketches 26 and 27.]
1868	10	157-165	[Supplement, 1868, p. 157.—Specimen table of local times of elongations and culminations of four circumpolar stars for 1873, latitude 40°, longitude 6h. west of Greenwich; correction for altered dates and latitudes.] [Supplement, p. 158.—In vertical of star; example of record and reduction; micrometer values; deduction of azimuth.] [Supplement, p. 160.—(a) Near culmination; example of record and computation; eyepiece micrometer, values determined and applied to level correction; (b) pivot micrometer, ditto, with example and record of reduction; single micrometer turn, ditto; discussion of set of four stars; centering of instrument for connection with triangulation.]

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GEODESY—Continued.

AZIMUTH—Continued.

Year.	Appendix.	Pages.	Subject and author.
1870	17	178-179	Changes of elevation and azimuth caused by the action of the sun at station, Dominguez, Cal.—George Davidson.
1870	22	226-227	Azimuth and apparent altitude of Polaris.—George Davidson.
1880	14	263-280	Astronomical azimuth.—C. A. Schott. [Four plates.] (1) General remarks; (2) instruments; (3) general considerations; (4) methods; (5) observations of a close circumpolar star near elongation; (5*b*) observations with the transit in the vertical of a close circumpolar star, near its elongation; (6) at any hour angle; (7) computation by fundamental formula; (8) by Napier's analogies; (9) by development into series; (10) at equal intervals before and after culmination; (10*b*) near culmination with eyepiece micrometer, corrections; (10*c*) with pivot micrometer; (11) observations of sun for azimuth; (12) examples of record and reduction to Articles 5, 5*b*, 6 and 7, 9, 10, 10*b*; line of collimation by reversal on star; examples to Articles 10*c*, 11; table of local time of elongation and culmination of four circumpolar stars for 1885, latitude 40°, longitude 6h. west of Greenwich.
1890	.....	215-218	Bulletin No. 21.—Determination of an azimuth from micrometric observations of a close circumpolar star near elongation by means of a meridian or transit and equal altitude instrument, or by means of a theodolite with eyepiece micrometer. Report on method and example of computation by Charles A. Schott, assistant. Observations by A. T. Mosman, assistant.
1891 Pt. 2	1	7-13	Approximate times of culminations and elongations, and of the azimuths at elongation of Polaris for the years 1889-1910.—By C. A. Schott.
1891 Pt. 2	2	15-19	On the determination of an azimuth from micrometric observations of a close circumpolar star near elongation by means of a meridian transit, or by means of a theodolite with eyepiece micrometer. [Observations by A. T. Mosman.] Report by C. A. Schott.
1895 Pt. 2	10	393-398	Tables of azimuth and apparent altitude of Polaris at different hour angles.—By G. R. Putnam.

ARC MEASURES AND LOCAL DEFLECTION OF THE PLUMB LINE.

1868	9	147-153	Results of the measurement of an arc of the meridian.—C. A. Schott. Length of the arc by four methods; accuracy of the preceding results; table and diagram; determination of the astronomical latitudes; recapitulation of results.
1869	7	113-115	Local deflections of the zenith in the vicinity of Washington City.—C. A. Schott.
1877	6	84-85	The Pamplico-Chesapeake arc of the meridian and its combination with the Nantucket and the Peruvian arcs for a determination of the figure of the earth from American measures.—C. A. Schott. Base lines; latitudes; resulting azimuths determined astronomically; conditional equations; combination of arcs of the meridian; resulting conditional equations of each arc of the meridian; Nantucket arc; Pamplico-Chesapeake arc; Peruvian arc; combination of arcs for determining the figure of the earth considered as a spheroid; table of data for figure of the earth, Bessel, 1841, Clarke, 1866, Coast Survey, 1877.
1879	8	110-123	Comparisons of local deflection of the plumb line.—C. A. Schott. Determination of the standard geodetic latitude; table of systematic apparent deflections in the meridian; determination of the standard geodetic azimuth; table of systematic deflection at right angles to the meridian resulting from observed azimuths; determination of the standard geodetic longitude; exhibition of the apparent local deflections of the vertical with reference to the Bessel and Clarke spheroids; table of comparison of effect of apparent local deflection of the vertical in latitude for the Bessel and Clarke spheroids; table of same for deflections in azimuth; in longitude. Appendix A, (Table 1), astronomical latitudes of the oblique arc along the Atlantic; (2) comparison of the register latitudes, apparent deflection in the meridian. Appendix B (Table 1), astronomical azimuths of the oblique arc along the Atlantic; (2) comparison of the register azimuths, apparent deflections of the meridian, and corresponding apparent deflections in the prime vertical. Appendix C (Table 1), astronomical (telegraphic) longitudes of the oblique arc along the Atlantic; (2) comparison of the register longitudes, apparent deflections in longitude, and corresponding apparent deflections in the prime vertical.

GEODESY—Continued.

ARC MEASURES AND LOCAL DEFLECTION OF THE PLUMB LINE—Continued.

Year.	Appendix.	Pages.	Subject and author.
1888	14	471-563	Determinations of latitude and gravity for the Hawaiian Government.—By E. D. Preston, assistant. (For abstract of contents see under "Gravity.")
1889	7	199-208	The need of a remeasurement of the *Peruvian arc.*—By E. D. Preston, assistant.

GRAVITY.

1876	15	292-337	Measurements of gravity at initial stations in America and Europe.—C. S. *Peirce.* Stations: Geneva, Paris, Berlin, Kew, Hoboken; instruments; diagram; *observations* of the duration of an oscillation; corrections 1 to 12; correction for rate of timekeeper; Paris meridian clock; diagram; Stand und Gang von Serffert, 1876, April 15-June 16; Kew; comparison of chronometers, diagram; Hoboken; table of instrumental constants; comparison of chronometers; instrumental constants; rates of chronometers graphically represented; *diagrams Nos. 31 to 35*; correction for arc; tables showing times of reading half amplitudes; *Paris, Berlin, Kew; table of decrement of arc from 1° 10′; diminution* of arc; decrement of pendulum arc, Hoboken, N. J., times of *reaching different amplitudes*; tables; diagram 36; reduction to a vacuum; coefficient of expansion; diagrams 37ᵃ, 37ᵇ; comparison of metres "A" and "49"; correction for wearing of the knife-edges; correction for slip of the knife-edges; correction for shorter length with heavy end up; for flexure of the support; length of the pendulum; on the tenths of millimetres at the ends *of the United States* Coast Survey pendulum metre, and on the screw revolutions of the Repsold *vertical comparator; value of the screw* revolutions of the upper microscope; of the lower microscope; results of observations *of length; summary of results* of comparison of lengths between the standard metre "49" and others; comparison of Prussian and United States pendulum standards, 1875; concluded length of the pendulum; center of mass; periods of oscillation and values of gravity; diagram; length of seconds pendulum at Geneva; tables of experiments, Paris, 1876, Berlin, Kew, Hoboken, N. J.
1876	15	410	Addendum to Appendix No. 15. Tables showing the modes of reducing the experiments.
1881	14	359-441	On the flexure of pendulum supports.—By C. S. Peirce, assistant.
1881	15	442-456	On the deduction of the ellipticity of the earth, from pendulum experiments.—By C. S. Peirce, assistant.
1881	16	457-460	On a method of observing the coincidence of vibrations of two pendulums.—By C. S. Peirce, assistant.
1881	17	461-463	On the value of gravity at *Paris.—By C. S. Peirce, assistant.*
1882	22	503-516	Report *of a conference on gravity determinations* held at Washington, D. C., in May, 1882.
1883	17	379-381	Determinations of gravity and other observations made in connection with the Solar Eclipse Expedition, May, 1883, to Caroline Island. A report by E. D. Preston.
1883	19	473-487	Determinations of gravity at *Allegheny, Ebensburg, and York, Pa.*—By C. S. Peirce, assistant.
1884	14	439-473	Determinations of gravity with the Kater pendulums at Auckland, New *Zealand; Sidney*, New South Wales; Singapore, British India; Tokio, Japan; San Francisco, Cal.; and Washington, D. C.—By Edwin Smith, assistant.
1884	15	475-482	On the use of the noddy for measuring the amplitude of swaying in a pendulum support.—By C. S. Peirce, *assistant.*
1884	16	483-485	Note on the effect of the *flexure of a pendulum* upon its period of oscillation.—By C. S. Peirce, assistant.
1885	16	509, 510	On the influence of a noddy on the period of a pendulum.—By C. S. Peirce, assistant.
1885	17	511, 512	On the effect of unequal temperature upon a reversible pendulum.—By C. S. Peirce, assistant.

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GEODESY—Continued.

GRAVITY—Continued.

Year.	Appendix.	Pages.	Subject and author.
1888	14	471-563	Determinations of latitude and gravity for the Hawaiian Government.—By E. D. Preston, assistant (22 illustrations). Letter of E. D. Preston to Superintendent Coast and Geodetic Survey, transmitting report of work for Hawaiian Government; plate showing crater of Haleakala; note on Hawaiian pronunciation; report; instruments; brief account of journey and work accomplished; plate, "Resting at 'Ana Moe Haole' (9,300 feet elevation), Edge of Crater;" triangulation; plate, "End of Cart Road (5,500 feet elevation), Slope of Haleakala;" plate, "Gravity and Latitude Station, Pakaoao," Island of Maui, etc.; plate, "Trail from Pakaoao to Kaupo Gap;" connections between the trigonometrical and astronomical stations, and geodetic latitudes of the latter (with sketch of triangulation); plate, "meridian telescope;" sketch of triangulation, showing the connection between latitude and gravity stations on the Island of Maui; latitude; inclination of micrometer thread; micrometer; level; discussion of the results; summary of results; observations and reductions for Honolulu; list of star catalogues consulted; mean places of Hawaiian latitude stars; gravity; description of stations; methods of observation; methods of reduction; sketch of Island of Maui, showing contour lines and compartments; results of pendulum observations on Maui; density of the surface rock; reduction of the time observations; plate, "Relative Weights depending on Star's Declination;" plate, "Pendulum Head No. 3;" plate, "Pendulum Stand;" general chart of Caroline Islands, showing gravity station of 1883; observations of 1883; description of stations; length of pendulums and position of center of mass; plate, "Gravity and Latitude Station, Lahaina, Maui;" plate, "Transit No. 2;" plate, "Pendulum Stand, 1887;" plate, "Repsold Vertical Comparator, with Pendulum No. 4 and 'Y and M No. 1,' in position;" plate, "Pendulum No. 3 (Peirce);" plate, "Chronograph;" plate, "Variations of Clock Rates;" diagram showing relative times of star observations and pendulum swings; difference between pendulums No. 3 and No. 4; instrumental constants and chronometer corrections; star residuals; pendulum observations; reductions to standard temperature and pressure; periods of oscillation at 29.554 inches of reduced barometer at Washington, and at 15° centigrade.
1889	.....	137-142	Bulletin No. 11.—Determinations of latitude and gravity for the Hawaiian Government.—By E. D. Preston, assistant (4 illustrations). Introductory remarks; relative gravity determinations; gravity results (with diagram); latitude determinations; geodetic connections and conclusions; map of Hawaiian Islands, showing the primary triangulation, latitude, and gravity stations; sketch of Island of Maui, showing contour lines and compartments; sketch of triangulation, showing connection between latitude and gravity stations on the Island of Maui. [This bulletin was published as an abstract in advance of Appendix 14, 1888, the full Report not having been printed until January, 1891.]
1890	12	625-684	Results of observations made to determine gravity and the magnetic elements at stations on the west coast of Africa and on some islands in the North and South Atlantic, 1889-90.—By E. D. Preston, Assistant. (11 illustrations).
1891 Pt. 2	13	479-485	On observations for the variations of latitude made near Honolulu, Oahu, Hawaiian Islands, in cooperation with the work of the International Geodetic Association, and on determinations of gravity and the magnetic elements. A preliminary report by E. D. Preston.
1891 Pt. 2	15	503-564	Determinations of gravity with the new half-second pendulums of the Coast and Geodetic Survey at stations on the Pacific coast, in Alaska, and at the Base stations, Washington, D. C., and Hoboken, N. J.—By T. C. Mendenhall. [Four illustrations, Nos. 23, 24, 25, 26.]
1893 Pt. 2	12	509-638	Determinations of latitude, gravity, and magnetic elements at stations in the Hawaiian Islands, including a result for the mean density of the earth, 1891, 1892. Report by E. D. Preston. [Sixteen illustrations, Nos. 22 to 37.]
1894 Pt. 2	1	7-55	Relative determination of gravity, with half-second pendulums, and other pendulum investigations by G. R. Putnam, Assistant; and a report on a geological examination of some Coast and Geodetic Survey gravity stations by G. K. Gilbert, Geologist, United States Geological Survey. [One illustration, No. 1, and 7 figures.]
1894 Pt. 2	2	57-70	Telegraphic determination of the force of gravity at Baltimore, Md., from simultaneous pendulum observations at Washington and Baltimore.—By E. D. Preston. [One diagram.]

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GEODESY—Continued.

GEOGRAPHICAL POSITIONS AND PROJECTIONS—TOPOGRAPHIC AND HYDROGRAPHIC SHEETS.

Year.	Appendix.	Pages.	Subject and author.
1851	12	162-442	List of geographical positions determined by the Coast Survey. Sections: method of triangulation and verification; average error; assumed size and form of the globe; station errors; checking of geodetic longitudes by telegraph; longitude of Cambridge from Greenwich; explanation of tables; list.—[Errata, 168, 169, 218, 304, 324, 372, 374, 375, 378: 1851, p. viii; Errata, 163, 169, 189, 190, 191, 194, 217, 218, 220, 258, 271, 276, 286, 324, 360, 372, 374, 375, 378, 400, 402, 404, 409, 416, 425, 480: 1853, p. 181; Errata, 185, 252: 1854, p. xii; Errata, 192, 225, 340, 341, 342, 344, 346, 411: 1855, p. xviii.]
1853	7	14-42	List of geographical positions.—[Errata, 15, 16 *et seq.*, 17, 20, 28, 29, 31, 32, 33, 34, 36, 42: 1854, p. xii; Errata, 19, 20: 1855, p. xviii.]
1853	39	96-163	Tables for projecting maps, with notes on map projections.—C. A. Schott and E. B. Hunt. Map projections classified and defined; Bonne's or modified Flamsteed's projection; the polyconic, its properties and varieties; formulas used for the computation of projection tables in use at the Coast Survey Office; graphic construction of polyconic projections, Coast Survey methods; rectangular polyconic method; Table I, relation between the measures of length used in different countries; II, for converting (A) metres into statute miles; (B) statute miles into metres; (C) metres into yards; (D) yards into metres; (E) yards into miles; III, length of a degree of the meridian in nautical and statute miles for each fifth degree of latitude between 20° and 50°; IV (A), length of a degree of longitude between the parallels of 17° and 50°, for each degree of latitude, expressed in nautical miles; (B) length of a degree of longitude between the parallels of 17° and 50° for each degree of latitude, expressed in statute miles; V (A), length, in metres, of 1° of latitude and longitude for each degree of latitude between 17° and 50°; (B) co-ordinates of curvature for each degree of longitude from 1° to 35° between latitudes 17° and 50°; VI, projection tables, giving latitude and longitude arcs and co-ordinates of curvature, from latitude 24° to 50°.—[Errata, 96, 97, 98, 102, 134: 1853, p. 182; Errata, 101, 113, 114, 115, 116, 130, 159: 1854, p. xii; Errata, 132, 137: 1866, p. xx.]
1855	8	119-148	List of geographical positions.—[Errata, 138-140: 1856, p. xx.]
1856	58	296-307	Projection tables.—J. E. Hilgard. Table applicable to the projection of maps of large extent and minimum distortion in represented area; method; earth's dimensions; Table I, of co-ordinates for projecting the points of intersection of meridians and parallels; II, length, in metres, of one degree of latitude and longitude from latitude 26° to 54°; values of the corresponding radii of the developed parallel, and angles at each pole for 10° of longitude; III, tables for converting measures (A) of metres into statute miles; (B) of statute miles into metres; (C) of metres into yards; (D) of yards into metres; (E) of yards into miles; IV, length of a degree of the meridian in nautical and statute miles for each fifth degree of latitude between 20° and 50°; V, length of a degree of longitude for each degree of latitude from 19° to 54°, expressed in nautical and statute miles; VI, radii and polyconic development of a sphere with radius=1.
1857	23-24	223-264	List of topographic and hydrograpic sheets, showing their titles, dates, scales, and registered numbers, as filed in the office.
1857	25	264-301	List of geographical positions.
1859	18	212-214	Topographic sheets.
1859	19	215-216	Hydrographic sheets.
1859	20	216-277	List of geographical positions.
1859	33	328-358	Projection tables for maps of large extent.—J. E. Hilgard. Table I, length in metres of 1° of latitude and longitude, values of the corresponding radii of the developed parallel, and angles at each pole for 10° of longitude; II, co-ordinates of curvature.
1861	13-14	176-180	List of topographic and hydrographic sheets—Continued.
1862	39	418-420	Part of Appendix 39.—Geographical positions on the Pacific coast, United States.—George Davidson, Assistant.
1863	15-16	143-146	List of topographic and hydrographic sheets—Continued.
1864	15	144-182	List of geographical positions.

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GEODESY—Continued.

GEOGRAPHICAL POSITIONS AND PROJECTIONS—TOPOGRAPHIC AND HYDROGRAPHIC SHEETS—Continued.

Year.	Appendix.	Pages.	Subject and author.
1865	8	50-99	List of topographic and hydrographic sheets—Continued.
1865	9	99-136	List of geographical positions in Sections V, VI, VII, and IX.
1865	10	137	List of geographical positions determined, approximately, in West Virginia, Kentucky, Tennessee, Alabama, Mississippi, and Missouri.
1865	20	176-186	Projection tables for a map of North America. Diagram; table of lengths, in metres, of 5° of latitude on the straight meridian; table of the radii of the parallels, and 5° of longitude on each parallel; I, table of co-ordinates, latitude 5° to 85°; II, co-ordinates of curvature, latitude 55° to 89°; III, length, in metres, of 1° of latitude and longitude 55° to 89°.
1867	18 A	265-274	List of topographic and hydrographic sheets of Alaska, by Russian authority.
1868	13	171-242	List of geographical positions determined by the Coast Survey.
1871	5	84-92	List of original topographic and hydrographic sheets registered in the archives of the U. S. Coast Survey from January 1, 1866, to December 31, 1871.
1873	6-7	82-93	List of original topographic and hydrographic sheets registered in the archives of the Coast Survey from June, 1865, to January, 1873.
1874	6	62-65	Geographical positions of prominent places in the United States.
1874	11	134	Additional geographical positions determined astronomically by the Coast Survey on and near the western coast.
1875	7	89-114	Original topographic sheets registered in the archives of the Coast Survey from January, 1834, to July, 1875 (No. 1 to 1378, inclusive)
1875	8	115-138	List of hydrographic sheets, geographically arranged, registered in the archives of the Coast Survey from January, 1835, to July, 1875 (Nos. 1 to 1244, inclusive).
1877	15	191-192	A quincuncial projection of the sphere.—C. S. Peirce. Tables I, II, of rectangular co-ordinates. (Diagram.)
1880	15	287-296	Comparison of the relative value of the polyconic projection used in the Coast and Geodetic Survey, with some other projections.—C. A. Schott. (Six plates and a chart.) Map projections classified and defined; three groups; first group—the square projection, the rectangular projection, the rectangular equal-surface projection, Cassini's projection, projection with converging meridians, projection by development of an intersecting cylinder, Mercator's projection; second group—Flamsteed's projection, De Lorgna's, Babinet's equal-surface projection, De l'Isle's conic projection, the simple conic projection, Murdoch's projection; third group—Lambert's projection, Bonne's, the polyconic; remarks on the history of Coast Survey projections; formulae for computation: (1) For an arc of a great circle of the sphere; (2) for the rhumb line on Mercator's projection; (3) for the straight line on Bonne's projection; (4) for the straight line on the polyconic projection; resulting distances, in nautical miles; resulting azimuths.
1884	6	135-321	Tables for the projection of maps, based upon a polyconic development of the Clarke spheroid, and computed from the equator to the pole. History of the projection tables of the Survey; the Clarke spheroid; formulæ used in establishing tables; arrangement and explanation of the tables; graphic construction of polyconic projections for limited areas; conversion tables; lengths of degrees of the meridian; arcs of the parallel in metres; meridional arcs; coordinates of curvature.
1885	8	285-439	Geographical positions of trigonometrical points in the States of Massachusetts and Rhode Island, determined by the U. S. Coast and Geodetic Survey between the years 1835 and 1885, and including those determined by the Borden survey in the years 1832 to 1838.—By Charles A. Schott, assistant. Introduction and explanation of the table of positions; number of stations and location; other statistical matter; observers and years of observation; accuracy of the work; index of stations in Massachusetts; table of geographical positions determined in the State of Massachusetts, and connection with stations in the surrounding States; triangulations of 1832-1885. [Illustrations 25-26.]

GEODESY—Continued.

GEOGRAPHICAL POSITIONS AND PROJECTIONS—TOPOGRAPHIC AND HYDROGRAPHIC SHEETS—Continued.

Year.	Appendix.	Pages.	Subject and author.
1888	8	313–403	Geographical positions of trigonometrical points in the State of Connecticut, determined by the U. S. Coast and Geodetic Survey between the years 1833 and 1886. Introduction and explanation of the tabular results by Charles A. Schott, Assistant. [Illustration.] Introductory remarks and explanation of data and results; standard geodetic data of the Survey; the unit of length; the geodetic surface of reference; the standard latitude; the standard longitude; the standard azimuth; elevations of stations above sea level not yet available; descriptions of stations; positions of stations and connecting lines shown on map; reduction of observations; explanation of method used in computation; table of logarithmic factors for the computation of geodetic positions, between latitudes 40° 55′ and 42° 55′; position computation, form for direct computation; position computation, form for inverse solution; length of arc of one minute in meridian and in parallel; effect of earth's curvature; positions arranged in geographical groups; observers and years of observation; computers engaged in work; metric conversion tables; errata in Appendix 8, 1885; index of ststions in Connecticut; tabular statements of geographical positions; primary stations; subordinate, primary, and secondary stations; Rhode Island State line to Thames River; Thames River; Thames River to Connecticut River; Connecticut River; Connecticut River to Housatonic River; Housatonic River to New York State line.
1894 Pt. 2	3	71–85	Standard geodetic positions in southeastern Alaska, depending on astronomic observations made during 1892, 1893, and 1894.—By C. A. Schott. [One diagram.]
1894 Pt. 2	10	349–615	Geographic positions of trigonometric points in the State of Massachusetts, determined by the U. S. Coast and Geodetic Survey between the years 1843 and 1894, and including those determined by the survey made by Borden in the years 1832 to 1838. (Second enlarged and revised edition, with 3 plates.) Introduction and explanation of the table of positions; table of log factors for the computation of geodetic positions, etc.; table of log factors for the computation of geodetic positions, between latitudes 40° 55′ and 42° 55′; specimen of position computation for secondary and tertiary triangulation; form for inverse solution; tabular arc values expressed in metres; spherical excess log M.; tables of stations and observers; tables for converting feet into metres and metres into feet, etc.; index of geographic positions, State of Massachusetts; table of geographic positions determined in the State of Massachusetts, and connections with stations in surrounding States; triangulations of 1832–1890 and of 1894. [Three illustrations, Nos. 11 and 13.]
1893 Pt. 2	9	223–424	Proceedings of the Geodetic Conference held at Washington, D. C., January 9 to February 28, 1894. [Nine illustrations, No. 11 to No. 19.]

GEOGRAPHICAL EXPLORATIONS.

1855	64	374–375	Abstract of a complete historical account of the progress of discovery on the western coast of the United States from the earliest period; compiled, under the direction of the Superintendent, by Dr. J. G. Kohl.
1855	65	376–398	Blake's Geological Report, western coast.—W. P. Blake. Observations on the physical geography and geology of the coast of California, from Bodega Bay to San Diego; physical geography of the mountain ranges adjoining the coast; geology of the principal bays and ports from Point Reyes to San Diego. [Errata, pp. 379, 380, 382, 387, 388, 392, 394, 395, 396; 1857, p. xviii.]
1856	65	319–322	Annals of discovery on the Atlantic coast.—J. G. Kohl. Abstract of a history of the progress of discovery on the Atlantic coast of the United States.
1856	66	322–324	Annals of discovery, Gulf of Mexico.—J. G. Kohl. Abstract of a memoir on the discovery and geographical development of the shores of the Gulf of Mexico within the limits of the United States.
1857	52	414–433	Western coast annals of maritime discovery and exploration.—J. G. Kohl. Report of the method and scope of a memoir on.
1860	41	399–402	Labrador expedition.—Lieut. A. Murray, U. S. N. Report of a voyage of the steamer *Bibb*. [One illustration.]

GEODESY—Continued.

GEOGRAPHICAL EXPLORATIONS—Continued.

Year.	Appendix.	Pages.	Subject and author.
1867	18	187-329	Alaska Territory; coast features and resources.—G. Davidson. Directory of the coast, 226-264; list of geographical positions, 265-274; aids to navigation, 274-280. [Sketches 21 to 23.] [Errata, 289, 22 from bottom, *read* Escholtz Bay.]
	E	281-290	Alaska Territory, geology of.—Th. A. Blake. *Ibid.*
	F	290-292	Zoology of Alaska Territory.—W. G. W. Harford.
	G	293-298	Vocabularies of the Kodiac, Unalashka, Kenai, and Sitka languages.
	H	299-317	Alaska Territory, meteorology of.—A. Kellog.
	L	318-324	Botany of Alaska Territory.—A. Kellog.
	N	325-329	Vocabulary, Alaskan.
1868	14	243-259	Geographical names on the coast of Maine.—Ed. Ballard.
1868	15	260-277	Condensed account of M. Hellert's explorations on the Isthmus of Panama, including his special explorations on the Isthmus of Darien, with suggestions for conducting a future survey.—G. Davidson. Explorations; plan for exploration of the River Darien; outfit and duties of engineers; instrumental outfit; use of the heliotrope for communicating messages; form of record of levelings, courses, and distances; rod for leveling, distance, and station mark for courses; to pack, unpack, and refill steel barometer; methods of ascertaining the discharge of water in any stream.
1873	11	111-112	Geographical and hydrographical explorations on the coast of Alaska.—W. H. Dall. Islands of Attu, Bouldyr, Kyska, Amchitka, Adakh, Atka, Amlia, Four Craters, Agashagok, Unalashka, Sannakh Reefs, Popoff Strait, current observations, azimuths, positions, and magnetic declinations. Tables 1 to 16; thermometer, mean for 1873; surface of sea water; five fathoms below surface; current observations made on board the *Yukon* during the voyage from San Francisco to Unalaska, May, 1873; heights of mountains determined in 1873. [Sketch No. 17.]
1874	.....	22	United States Coast Survey. Report on the Nicaragua route for an interoceanic ship canal, with a review of other proposed routes; made by Maximilian von Sonnenstern to the minister of public works of Nicaragua. (One illustration. Translated for the United States Coast Survey. Separately published.)
1875	10	157-188	Report on Mount Saint Elias, etc., Alaska.—W. H. Dall. I. Historical notes; tabular results of heights, latitudes, and longitudes; general considerations. [Sketches 22, 23.] II. Discussion of data; reduction of observations, made in 1874, to determine the heights of Mounts Saint Elias, Cook, Crillon, Fairweather, and Vancouver; details of computations.
1880	18	346-411	Landfall of Columbus.—G. V. Fox. An attempt to solve the problem of the first landing place of Columbus in the New World. Introduction; narrative and discussion; the track of Navarrete; of Varnhagen; of Washington Irving; of Capt. Becher; according to G. V. Fox; conclusion; summary. Appendix A, p. 401; age of Columbus. Appendix B, p. 401; mile and league of Columbus. Appendix C, p. 403; variation of the compass in 1492. Appendix D, p. 405; the log of Columbus across the Atlantic Ocean, 1492. Appendix E, p. 408; the vessels of Columbus. [Sketch No. 83.]
1884	19	495-617	History of discovery and exploration on the coasts of the United States.—By J. G. Kohl, Ph. D. Prefatory note; abstract of contents; discovery and exploration on the Atlantic coast; the Northmen; Sebastian Cabot, 1497; Ponce de Leon, 1512; Lucas Vasquez de Ayllon, 1520-1525; John de Verrazano, 1524; Estevan Gomez, 1525; English voyage, 1527; Spanish expeditions, 1524-1543; Capt. Jean Ribout; Sir John Hawkins, 1565; Florida, 1565-1574; Sir Walter Raleigh; Capt. John White, 1587-1590; coast of New England, 1602-1605; Gosnold and Gilbert, 1602; Martin Pring, 1603; Bartholomew Gilbert, 1603; Sieur de Monts and Champlain, 1605; Capt. George Weymouth, 1605; Capt. Christopher Newport, 1606; Capt. John Smith, 1668; Capts. Popham and Raleigh, 1607; Capt. Samuel Argall, 1613; Capt. John Smith, 1614; Henry Hudson, 1609; David Pietersz de Vries, 1632; table of maps of the Atlantic coast of North America, or parts thereof, published between 1500-1770. discovery and exploration of the Gulf of Mexico—abstract of con-

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GEOGRAPHICAL EXPLORATIONS—Continued.

Year.	Appendix.	Pages.	Subject and author.
			tents; Columbus, 1492-1502; Sebastian Cabot, 1497; Juan Diaz de Solis and Vincente Yanez Pinzon, 1506; Sebastian de Ocampo, 1508; Juan Ponce de Leon, 1512; Velasquez, 1511-1514; *Diego Miruelo*, 1516; Cordova; Grijalva and Alaminos, 1518; Fernando Cortez, 1519; Don *Alonzo Alvarez Pineda, 1519; Narvaez, 1520; Pineda and Camargo*, 1520; Francisco de Garai, 1523; Narvaez, 1527-1536; De Soto, 1539; *Diego Maldonado, 1540; Andres de Ocampo*, 1543; Guido de Las Bazares, 1558; French and English adventurers, 1555-67; Menendez, 1573; New Mexico, 1581-83; Robert de la Salle, 1682; Juan Enriquez Barroto, 1685; Iberville, 1698-99; St. Joseph's Bay, 1718; Galveston Bay, 1721; Charlevoix, 1722; titles and copies of maps illustrating Dr. Kohl's History of the Discovery and Exploration of the Gulf of Mexico; discovery and exploration of the Pacific coast of the United States, abstract of contents—*introduction, 1532-1579; California*, 1532-34; California, 1535-36; California, 1539-40; Sir Francis Drake, 1579; *Francisco Gali and Jayme Juan, 1584; Sebastian Rodriguez* Cermenon, 1595; Sebastian Vizcaino, 1596; New Mexico and Cali*fornia*, 1582-1717; Juan Ugarte, 1722, 1732, 1746, 1766; Russian expeditions; French expeditions, 1769; Franciscans and Vancouver, 1769-92; Missions, 1769; Don Juan Bautista Anza, 1774; Sanora-San Diego, 1775; Northwestern coast, 1775; San Francisco Bay, 1775; Santa Clara Mission, 1776, 1779; Capt. James Cook, 1778; La Pérouse, 1786, 1785-1787; Capt. John Meares, 1788; Strait of Fuca, 1789; Don Manuel Quimper, 1790; Malaspina, 1791; Marchand, 1791; Vancouver, 1792-95; Galiano *and Valdez, 1792; Caamaño, 1792; Capt. W. R. Broughton*, 1795-98; Lewis and Clarke, 1804-06; Russian expeditions, 1803-06; Fur compa*nies, 1806-21; Russian settlements*, 1812-41; Missionary travels; Capt. F. W. Beechy, 1827; Sir Edward Belcher, 1836-42; French explorations, 1820-42; United States expeditions, 1820-47; United States exploring expeditions, 1838-41; Oregon and California, 1842-46; Maj. W. H. Emory, U. S. Corps Topographical Engineers, 1846-47; titles of copies of maps of the *Pacific coast of North America*, or parts thereof.
1886	7	155-253	An examination of some of the early voyages of discovery and exploration *on the northwest* coast of America from 1539 to 1603.—By George Davidson, A. M., Ph. D., Assistant. Introduction, prefatory remarks; efforts to reconcile many of the discrepancies of the old Spanish, English, American, and French navigators; indomitable courage and perseverance of the old Spanish navigators; many of the positions of Ulloa, Cabrillo, *Ferrelo, Drake, and* Vizcaino can now be located; effort to follow the navigators day by day; some of the *authorities cited; origin of name California*; what it designated; principal work consulted; description of localities by *the different navigators, Ferrelo*, Cabrillo, Ulloa, and Vizcaino, with notes by Davidson, placed in four parallel columns; table of the *landfalls* of Cabrillo (C.) and Ferrelo (F.), with their names by Ulloa (U.) Drake (D.), and Vizcaino (V), and the present names and latitudes. Index to Appendix 7, 1886. Prefatory note; authorities and publications consulted or referred to; discoverers and explorers; harbors (ports) and anchorages, bays, channels, coves, gulfs, lagoons, straits; headlands; capes, points, *bluffs*; islands, reefs, and rocks; mountains and mountain ranges (Sierras), table-lands (mesas); rivers, *and streams; settlements; Indian villages* (Pueblos); *miscellaneous* notices. [Illustrations 18.]
1888	.....	3-6	Bulletin No. 2. Notes on Alaska from recent surveys.
1890	19	759-774	Notes on an original manuscript chart of Bering's expedition of 1725-30, and on an original manuscript chart of his second expedition; together with a summary of a journal of the *first expedition*, kept by Peter Chaplin, and now first rendered into English from Bergh's Russian version.—*By William H. Dall.* [*Two illustrations.*]
1890	20	775-777	*On an early chart of Long Island Sound.*—By Capt. C. H. Townsend.
1896	11	373	Compilation of the most recent information relative to the harbors, anchorages, and dangers to navigation in the vicinity of Chatham and Peril Straits and Cooks Inlet, Alaska. Arranged and compiled by Lieut. Hugh Rodman, U. S. N., assistant.

HYPSOMETRY.

SPIRIT LEVELING.

Year.	Appendix.	Pages.	Subject and author.
1854	34	95–103	Measurement of heights.—T. J. Cram. Experimental comparison of the methods of measuring heights by leveling, by vertical angles, by the barometer, and by the boiling-point apparatus. [Errata, 102; 1855, p. XIX.]
1860	38	397	Table of heights for the use of topographers.—C. A. Schott. Height in feet corresponding to a given angle of elevation and a given distance in metres, for use in the construction of contour lines by plane tables.
1870	7	75–76	Report on the leveling operations between Keyport, on Raritan Bay, and Gloucester, on the Delaware River, to determine the heights above mean tide of the primary stations Beacon Hill, Disboro, Stony Hill, Mount Holly, and Pine Hill.—R. D. Cutts. Heights above mean tide determined by the spirit level, p. 75; tidal stations, p. 75; instruments, p. 75; tidal observations and records, p. 76.
1870	9	90–91	List of heights, above the half-tide level of the ocean, of trigonometrica stations determined by the U. S. Coast Survey.
1871	11	154–170	Comparison of the methods of determining heights by means of leveling, vertical angles, and barometric measures, from observations at Bodega Head and Ross Mountain, California.—George Davidson, C. A. Schott. (1) Result of the leveling operations. (2) Results of hourly observations of reciprocal and simultaneous zenith distances for difference of heights of the two stations; Tables 1 to 6, zenith distances, atmospheric pressure, etc.; reduction of zenith distances; diagrams. (3) Results of hourly observations of atmospheric pressure for difference of heights of the stations; diagrams.
1879	15	202–208	Precise leveling.—O. H. Tittmann. Instruments and methods used in the Coast and Geodetic Survey (Sketch No. 53); description of level; rod and target; adjustments (Figs. 1 to 6); verification and adjustments of the rods; methods—(1) simultaneous double leveling in one direction; (2) leveling in opposite directions; method of observing (*a, b, c, d*); river crossing; bench marks; degree of precision; records and computations; curvature and refraction; temperature correction; table of curvature and refraction; form of record; form of computation; form of abstract of results.
1879	16	212–213	Refraction on lines passing near a surface of water, from observations made at different elevations across the Potomac River.—Andrew Braid. Summary of results.
1880	11	135–144	Geodetic leveling on the Mississippi River.—Andrew Braid. Bench marks; instrument; rods; method of observing; specimen of record; probable and mean error; abstract of results; sketches 45, 46, 47.
1882	11	517–556	Results of the transcontinental line of geodetic spirit leveling near the parallel of 39°. First part from Sandy Hook, N. J., to St. Louis, Mo.—Field work executed by Andrew Braid, Assistant (with map). Reduction, by Charles A. Schott, Assistant. Prefatory remarks; determination of the mean tidal level at Sandy Hook; instrumental constants; probable error of results from geodetic spirit leveling; table of results from Sandy Hook, N. J., to Hagerstown, Md.; descriptions of primary and secondary bench marks between Sandy Hook, N. J., and Hagerstown, Md.; table of results from Hagerstown, Md., to Grafton, W. Va.; description of primary and secondary bench marks between Hagerstown, Md., and Grafton, W. Va.; table of results from Grafton, W. Va., to Athens, Ohio; description of primary and secondary bench marks between Grafton, W. Va., and Athens, Ohio; table of results from Athens, Ohio, to Mitchell, Ind.; description of primary and secondary bench marks from Athens, Ohio, to Mitchell, Ind.; table of results from Mitchell, Ind., to St. Louis, Mo.; description of primary and secondary bench marks between Mitchell, Ind., and St. Louis, Mo.; sketch showing the position of the principal bench marks from Sandy Hook, N. J., to St. Louis, Mo. [Illustration 32½.]
1887	9	185–205	Heights from spirit levelings of precision between Mobile, Ala., and Carrollton (New Orleans), La.—Executed by J. B. Weir, Assistant, in 1885–86. Reported by Charles A. Schott, Assistant. Route of levels, date of leveling, observer, instruments, and instrumental constants; comparison of length and divisions of rods with standard on Saxton's dividing and comparing machine; method of observing; statistical information; computations; results in three tables. I contains the individual results and the necessary data to enable one

HYPSOMETRY—Continued.

SPIRIT LEVELING—Continued.

Year.	Appendix.	Pages.	Subject and author.
			to judge of the accuracy of the measures; II shows the resulting heights and probable uncertainties of the principal bench marks between Biloxi and Carrollton above the average Gulf level and a comparison of results from two levelings, *i. e.*, that by the Mississippi River Commission and that by the Coast and Geodetic Survey; III exhibits the resulting heights and probable uncertainties of the line Biloxi to Mobile; description of bench marks.
1887	14	275-300	Report of the results of spirit leveling of precision about New York Bay and vicinity in 1886 and 1887.—Observations by John B. Weir, Assistant, and J. E. McGrath, Subassistant. Discussion by Charles A. Schott, Assistant. Route lines of levels, with map; observers and dates of leveling; instrumental constants; method of observing; computations; resulting elevations; result of geodetic leveling in the vicinity of New York, 1886-'87; main line from Sandy Hook, N. J., to Dobbs Ferry, Hudson River, N. Y.; accuracy of the preceding results for heights; location and description of bench marks in the main line and branches of spirit levels, Sandy Hook to Dobbs Ferry. [Illustration 43.]
1888	10	409-426	Heights from spirit leveling of precision between Mobile, Ala., and Okolona, Miss.—Field work by J. B. Weir, Assistant, and J. E. McGrath, Subassistant, in 1884, 1886, 1887. Reduction by C. A. Schott, Assistant.
1888	11	427-453	Heights from spirit leveling of precision between New Orleans, La., and Arkansas City, Ark.—Field work between New Orleans and Greenville, Miss., by O. H. Tittmann and Andrew Braid, Assistants, and by John B. Weir, Subassistant, in 1879, 1880, and 1881, and between Greenville, Miss., and Arkansas City, Ark., by the Mississippi River Commission, in 1880 and 1881. Reduction by Charles A. Schott, Assistant.
1888	12	455-464	Heights from spirit leveling of precision between Arkansas City, on the Mississippi River, and Little Rock, Ark.—Field work by J. E. McGrath, Subassistant, in 1887-'88. Reduction by Charles A. Schott, Assistant.
1889	15	461-466	Result of spirit leveling between tide water at Annapolis, Md., and the Capitol bench mark at Washington, D. C.—From observations in 1875, by F. W. Perkins, Assistant.—Report by C. A. Schott, Assistant.
1892 Pt. 2.	3	161-203	On the results of spirit leveling of precision between Okolona, Miss., and Odin, Ill., from observations made by J. B. Weir, Assistant; Isaac Winston and P. A. Welker, Subassistants, and F. A. Young, Aid.—Report by C. A. Schott. One illustration, No. 19, to be used also with Appendix No. 4.
1892 Pt. 2.	4	205-234	On the results of spirit leveling of precision between Corinth, Miss., and Memphis, Tenn., from observations made in 1890 and 1891 by Isaac Winston, Subassistant, and F. A. Young, Aid.—Report by C. A. Schott.
1893 Pt. 2.	2	19-36	Heights from geodetic leveling between St. Louis and Jefferson City, Mo., 1882-1888.—Executed by Andrew Braid, Gershom Bradford, and Isaac Winston. Discussion and report by C. A. Schott. [One illustration, No. 1.]
1895 Pt. 2.	8	381-382	Description of leveling rods designed and constructed for use in geodetic leveling operations.—By Isaac Winston. [Two illustrations, Nos. 38 and 39.]
1896	2	237-246	Resulting heights from spirit leveling between Old Point Comfort and Richmond, Va., from observations made by J. B. Weir, Subassistant, between September and November, 1884, and by I. Winston, Assistant, between December, 1891, and February, 1892. With diagram showing route line and position of bench marks. Submitted by the chief of the Computing Division for publication April 29, 1896. [One illustration.]
1896	3	247-260	Resulting heights from spirit leveling between Richmond, Va., and Washington, D. C., from observations made by J. B. Weir, Subassistant, in September and October, 1893, and September and October, 1894, with releveling by J. B. Weir between Richmond and Fredericksburg in May and June, 1896, and verification leveling between the two cities by I. Winston, Assistant, between April and June, 1895. With diagram showing route line and position of bench marks. Submitted for publication by Charles A. Schott, Assistant, in charge Computing Division, September 17, 1896. [One illustration.]

HYPSOMETRY—Continued.

SPIRIT LEVELING—Continued.

Year.	Appendix.	Pages.	Subject and author.
1896	3	261-264	Resulting heights from spirit leveling between Washington, D. C., and Hagerstown, Md., from observations made by J. B. Weir, Subassistant, between July and September, 1883. With diagram showing route line and position of bench marks. *Submitted for publication* by Charles A. Schott, Assistant, in charge Computing Division, September 18, 1896.
1896	5	265-284	Resulting heights from spirit leveling between Jefferson City, Mo., and Holliday, Kans., from observations by I. Winston, Assistant, and F. A. Young, Aid, between April 21 and October 13, 1891. With diagram showing route line and position of bench marks, Submitted for publication by Charles A. Schott, Assistant, in charge of Computing Division, October 1, 1896. [Two illustrations.]

TRIGONOMETRIC AND BAROMETRIC HEIGHTS.

1854	34	95-103	Measurement of heights.—T. J. Cram. Experimental comparison of the methods of measuring heights by leveling, by vertical angles, by the barometer, and by the boiling-point apparatus.—[Errata, 102: 1865, p. xix.
1868	7	124-129	Trigonometrical leveling.—R. D. Cutts. (1) By reciprocal zenith distances; (2) by zenith distances measured at one station; (3) by observed zenith distances of the sea horizon; (4) by observed angles of elevation or depression.
1870	8	77-89	Report on the results of barometrical observations made in connection with the line of spirit leveling, from Raritan Bay to the Delaware River, to determine the heights, etc.—R. D. Cutts. *Comparison of instruments and the determination of personal errors*, pp. 77-81; the computations, pp. 81-89.
1870	9	90-91	List of heights, above the half-tide level of the ocean, of trigonometrical stations determined by the U. S. Coast Survey.
1871	11	154-170	Comparison of the methods of determining heights by means of leveling, vertical angles, and barometric measures, from observations at Bodega Head and Ross Mountain, California.—George Davidson, C. A. Schott. (1) Result of the leveling operations; (2) results of hourly observations of reciprocal and simultaneous zenith distances for difference of heights of the two stations; tables 1 to 6, zenith distances, atmospheric pressure, etc.; reduction of zenith distances; (3) results of hourly observations of atmospheric pressure for difference of heights of the stations; diagrams.
1871	12	171-175	Report on the leveling operations between Keyport, on Raritan Bay, and Gloucester, on the Delaware River, to determine the height above mean tide of the primary stations Beacon Hill, Disboro, Stony Hill, Mount Holly, and Pine Hill.—R. D. Cutts. *Tidal stations; instruments; field operations and records*; Tables I to V.
1876	16	338-353	Reprint of Appendix 11, Report of 1871.
1876	17	355-367	Observations of atmospheric refraction.—Contribution No. II.—C. A. Schott. Determination of several heights by the spirit level, and measures of refraction by zenith distances; also, observations of the barometer at Ragged Mountain, Maine, by F. W. Perkins. (A) Results of the operations by spirit level executed near the entrance of Penobscot Bay in 1874; (B) results of observations of zenith distances at Ragged Mountain for atmospheric refraction; tables; diagram; meteorological observations; (C) meteorological observations at Ragged Mountain, at Mount Desert, and at White Head Light; two short simultaneous sets; resulting differences of height.
1876	18	368-387	Atmospheric refraction and adjustment of hypsometric measures.—Contribution No. III.—C. A. Schott. Determination of the coefficient of refraction from zenith distances observed in northern Georgia, by Assistants C. O. Boutelle and F. P. Webber, in 1873 and 1874, and adjustment of difference of heights by the method of least squares: (1) Results of atmospheric refraction observed at stations in northern Georgia in 1873-1874; tabulated zenith distances; determination of the coefficient of refraction from observed zenith distances; resulting values for coefficient of refraction; (2) computation of heights of stations from measured difference of height, with application of the method of least squares; heights above mean sea level; adjustment of results; formation of conditional equations; equations of correlatives; normal equations; probable error of resulting heights; additional remarks and examples for adjustment of heights measured under conditions different from those obtained

HYPSOMETRY—Continued.

TRIGONOMETRIC AND BAROMETRIC HEIGHTS—Continued.

Year.	Appendix.	Pages.	Subject and author.
			above; table of log. M and log. N; table of logarithms of radius of curvature to the earth's surface for various latitudes and azimuths, based upon Clarke's ellipsoid of rotation (1866) and for the metric unit.
1876	19	388-390	Hypsometric formulæ, based upon thermodynamic principles.—C. A. Schott.
1881	10	225-268	Meteorological researches, Part III—Barometric hypsometry and reduction of the barometer to sea level, by William Ferrel. Chapter I, the theory of barometric hypsometry; Chapter II, practical applications of the theory; Chapter III, reduction of the barometer to the sea level; hypsometrical tables; errata in Part II; diagram.—[Illustration 38.]
1883	12	289-321	Results of observations for atmospheric refraction on the line Mount Diablo to Martinez, California, in connection with hypsometric measures by spirit level, the vertical circle, and barometer, made in March and April, 1880, by George Davidson, assistant. Reported by Charles A. Schott, assistant. Introduction; observations of double zenith distances for the measure of refraction and of differences of height. Table I, Zenith distances of Martinez east, observed at Mount Diablo, and reduced to station marks at both stations, March and April, 1880. Table II, Zenith distances of Mount Diablo, observed at Martinez east, and reduced to station marks at both stations, March and April, 1880; combination of the preceding tabular zenith distances to obtain a homogeneous series of hourly mean values. Table III, Observations at Mount Diablo, California, March and April, 1880. Table IV, Observations at Martinez east, California. Table V, Diurnal variation in angle of refraction, in the coefficient of refraction, and in error of computed differences of height. Table VI, Atmospheric pressure observed at Mount Diablo, March and April, 1880. Table VII, Atmospheric pressure observed at Martinez east, March and April, 1880. Table VIII, Atmospheric temperature observed at Mount Diablo, March and April, 1880. Table IX, Atmospheric temperature observed at Martinez east, March and April, 1880. Table X, Observations of atmospheric humidity at Mount Diablo, March and April, 1880. Table XI, Observations of humidity at Martinez east, March and April, 1880. Table XII, Observations at Mount Diablo, California, March and April, 1880. Table XIII, Observations at Martinez east. Table XIV, Observations at Mount Diablo, California, March and April, 1880. Table XV, Observations at Martinez east, California. Table XVI, Observations at Mount Diablo, California, March and April, 1880. Table XVII, Observations at Martinez east, California; barometric differences of height; Dr. Jordan's formula. Table XVIII, Values of $\triangle h$, computed from Jordan and Rühlmann's formulæ, with apparent error in mean temperature t. Table XIX, Comparison of Bauernfeind's theory of refraction with observations at Mount Diablo and Martinez east. Table XX, Comparison of Jordan's theory of refraction with observations at Mount Diablo and Martinez east. Table XXI, Rate of change of temperature with altitude for the stratum of air between Martinez east and Mount Diablo. Table XXI (*b*), Rate of change of temperature with altitude for the stratum of air between Bodega Head and Ross Mountain, California, and comparison of observed and computed temperatures at these stations. Table XXII, Comparison of deduced and observed temperatures of the air at the observing stations Martinez east and Mount Diablo. Table XXIII, Observations of the direction and force of the wind and state of the sky at Martinez east, California, March and April, 1880. Table XXIV, Observations of the direction and force of the wind and state of the sky at Mount Diablo, California, March and April, 1880. Diagram of the hypsometric measures at Mount Diablo and Martinez east, California.
1884	10	391-405	Results of a trigonometral determination of the heights of the stations forming the Davidson quadrilaterals. Observations by George Davidson, Assistant, 1876-1882. Discussion by Charles A. Schott, Assistant, 1884. Introductory remarks; accommodation of observations to Jordan's formulæ with auxiliary tables; abstract of resulting vertical measures and computations of heights of stations forming the Davidson quadrilaterals, California; specimen of record; specimen of abstract of resulting daily measures of the zenith distance of the same object; abstract of resulting zenith distances and of other data for the computation of heights involved in the Davidson quadrilaterals; resulting differences of heights; estimate of the probable error of the resulting $\triangle h$ and determination of weights for their adjustment; adjustment of the measured differences of heights of stations forming the connection of the Yolo base with the principal triangulation by application of the method of least squares by the process referring to indirect observations, with diagrams; recapitulation of measures.

SURVEYING.

TOPOGRAPHY.

Year.	Appendix.	Pages.	Subject and author.
1855	21	162, 163	New York City.—Report of F. H. Gerdes, Assistant, on his topographical survey of Manhattan Island.
1855	22	164	Report on topography executed by the party of Assistant S. A. Gilbert on the western and southern sides of Long Island.
1855	23	164, 165	Report on topography executed by the party of Assistant A. M. Harrison on the coast of New Jersey.
1856	48	281, 282	Comparative maps, New York Harbor.—A. Boschke. Method of survey.
1860	38	397	Table of heights for the use of topographers.—C. A. Schott, Assistant. Height in feet corresponding to a given angle of elevation and a given distance in metres, for use in the construction of contour lines by plane tables.
1865	22	203-231	Treatise on the plane table and its use, with diagrams.—A. M. Harrison, Assistant. Description; adjustments; paper; scales; projections for field work; three-point problem; practical modes of determining the position of a fourth point by resection upon three fixed points; Lehmann's method; Netto's method; Bessel's methods; two-point problem; field work; contours; example; table of heights; chain; telemeter; table of reduction of hypothenuse to base; reconnaissance; office work.—[Sketches 30, 31, 32.]
1879	11	191	Report on the preparation of standard topographical drawings.—By Edwin Hergesheimer, Assistant. [Illustrations 42 to 49, inclusive.] This paper was afterwards republished as the first part of Appendix No. 14, 1883.
1880	13	172-200	A treatise on the plain table and its use in topographical surveying.—By E. Hergesheimer, Assistant. Description; alidade, new style; old style; adjustments; field work; three-point problem; by construction; by trigonometry; determination of position by resection; Bessel's method by inscribed quadrilateral; by construction of similar triangles; practical modes of determining, from the triangle of error, the position of a fourth point by resection upon three fixed points; Lehmann's method; Netto's method; two-point problem; representation of the terrene; table of heights; example; formula for determining heights by a vertical angle and distance; example; comparison of feet and metres; regular and irregular method of determining curves; adjustment of the new alidade for observation of altitudes; example; distance; stadia; composed of two parts, rod and telescope with vertical arc; focal distance; its relation to the distant object; table for reduction of hypothenuse to base; projection for field sheets.—[Illustrations 49 to 61.]
1881	7	124, 125	Type forms of topography, Columbia River.—By E. Hergesheimer, Assistant. Discussion of the forms of the hills and mountains of the basin of the Columbia River below Wallula, with diagrams.—[Illustration 33.]
1883	14	367, 368	Report on the preparation of standard topographical drawings.—By Edwin Hergesheimer, Assistant. List of drawings which represent various special types of topography, with topographical drawings to be used as guides for inking original plane-table sheets.—[Illustrations 35 to 50.]
1891 Pt. 2	16	565-746	Proceedings of the topographical conference held at Washington, D. C., January 18 to March 7, 1892. [Four full page illustrations, Nos. 32 to 34.]
1893 Pt. 2	3	37-116	Phototopography as practiced in Italy under the auspices of the Royal Military Geographical Institute, and as practiced in the Dominion of Canada under the auspices of the department of the interior. Also a short historical review of other photographic surveys and publications on the subject.—By J. A. Flemer. [Two illustrations, Nos. 2 and 3, with 29 figures illustrating the subject.]
1895	11	399-516	Subdivision I. List of original topographic sheets, geographically arranged, registered in the archives of the United States Coast and Geodetic Survey from January, 1834, to December 31, 1895. Nos. 1 to 2209, inclusive.

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HYDROGRAPHY.*

Year.	Appendix.	Pages.	Subject and author.
1852	14	97, 98	Screw-pile signals along Florida reef.—James Totten.
1853	37	93, 94	Aligning reflector or interranger, Hunt's.—E. B Hunt.
1855	16	157–160	Florida reef screw-pile beacons.—Description of signals.—James Totten.
1855	56	361	Specimen box.—B. F. Sands. Instrument for procuring specimens of bottoms in sounding.—[Sketch 55.]
1855	60	365, 366	Sands's hydrographic signal.—B. F. Sands. Description and drawing of his gas-pipe signal used in the breakers on Dog Island Bar.—[Sketch 54.]
1857	13	150, 151	Method of sweeping.—(See Depths at Hell Gate, etc.)
1857	47	398, 401	Sounding apparatus. New method proposed by E. B. Hunt for sounding in moderate depths.
1857	48	401, 402	Experimental soundings made with Hunt's sounding apparatus.—W. G. Temple.
1860	39	398	Sounding apparatus (specimen), Mitchell's, for shallow water.—[Sketch 40.]
1856	18	133–137	Depths in channel entrances of harbors, rivers, ports, and anchorages on the coasts of the United States.
1857	21	178–184	The same.—[Errata, 182, 183; 1857, p. xviii.]
1859	15	168–171	The same.
1862	5	86–92	The same.
1874	17	66–71	The same.
1883	7	137–237	A table of depths for the harbors of the coasts of the United States.—Prepared in outline by Commander Edward P. Lull, U. S. N. Expanded and extended by J. S. Bradford, Assistant, and Mr. John W. Parsons. Tides; table of depths, Atlantic coast; table of depths, Gulf coast; table of depths, Pacific coast; table of depths, Pacific and Arctic coasts, Alaska and eastern coast of Asia.
1878	.....	50	General instructions in regard to inshore hydrography.
1883	.....	1–81	General instructions for hydrographic work.—(One pamphlet, octavo, separately printed.)
1894	.....	111	General instructions to hydrographic parties.—(One pamphlet, octavo, 11 full-page plates, 11 illustrations. Treasury Doc. No. 1655, C. & G. S.)

* There are a large number of appendices in the earlier reports of the Survey which are properly classified under this heading, but which have only a transient value, since they relate to sailing directions for entering harbors, to the establishment of light-houses, the placing of buoys, etc., and in general to hydrographical conditions existing between thirty and forty years ago.

PHYSICAL HYDROGRAPHY.

TIDES, CURRENTS, WINDS, AND SHORE-LINE CHANGES DUE TO THE ACTION OF THE SEA.

1845	3	41–43	Remarks on the currents in Mississippi Sound and changes in the magnetic variation.—F. H. Gerdes.
1846	8	68–70	Tides at the entrance of Mobile Bay.—C. P. Patterson
1850	8	80–81	Encroachment of the sea on the south side of Long Island.—Prof. A. G. Pendleton.
1850	9	81–82	Progress of Sandy Hook from 1848 to 1850.—H. L. Whiting.—[*See* Sketch 8 (B, No. 4, 1851).]
1851	7	127–136	Notes on Cat Island tides.—A. D. Bache. Discussion; table of diurnal and semidiurnal curves.—[Sketch 35 (H, Nos. 2–6).]
1851	8	136–137	Graphical method of representing current observations, as used in the Coast Survey.—A. D. Bache.—[Sketch 3 (A, No. 3).]

PHYSICAL HYDROGRAPHY—Continued.

TIDES, CURRENTS, WINDS, AND SHORE-LINE CHANGES DUE TO THE ACTION OF THE SEA—Continued.

Year.	Appendix.	Pages.	Subject and author.
1851	28	482–484	Beaufort Harbor, North Carolina.—H. L. Whiting. Operative causes of its physical permanency.—[Sketch 17 (D, No. 5).]
1851	31	488–494	Florida coast reconnoissance.—F. H. Gerdes. (A) Description; (B) survey; (C) tides and currents; (D) railroad across the peninsula; (E) light-houses and buoys; (F) general remarks on Cedar Keys Harbor.—[Sketches 27, 28, and 29.]
1851	50	528–530	San Diego River entrance.—[Sketches 6 and 7.]—(*See* C, statistics; *a*, coast, western.)
1851	56	553–558	Hell Gate Channel.—W. A. Bartlett. Examination of reefs and changes produced by blasting.—[Errata, p. ix.]
1852	8	84	On Pot Rock, Hell Gate.—W. A. Bartlett.
1852	.....	12	U. S. Coast Survey. Directions for observations of tides. Printed for the use of the tidal observers from the manuscript instructions, 1852. (Two illustrations.) Gideon & Co., printers.
1852	22	111–122	Discussion of Cat Island tides.—A. D. Bache. Table I, Sketch 1, diurnal and semidiurnal curves deduced from observations, with curves of sines; (A) diurnal wave; heights and times; II, Sketch 2, maximum ordinates of diurnal curve, etc.; III, Sketch 3, effect of sun's declination on height; IV, effect of moon's parallax; V and VI, coefficients; VII, computed diurnal ordinates compared with observations; VIII, Sketch 8, residuals classed by moon's ages; IX, same, corrected by change of cosines; X, difference of diurnal maximum ordinates, from last and from first methods of groups—semidiurnal effect; XI, correction to maximum diurnal ordinate for high-water ordinate; XII to XV, further residual corrections; comparison with hypothesis; (B) semidiurnal curve; XVI, half monthly inequality in height; XVII, discrepancies between observations and formula.—[Sketch 25 (H, Nos. 5–9).]—[Errata, pp. 115, 119, 121: 1853, p. 182.]
1853	27	71–76	Notes on tides at Key West.—A. D. Bache. Table I, half-monthly inequality of tides, one year's observations; II, diurnal inequality, with formula; decomposition of the curves of observation; semidiurnal tides; III, first six months; IV, second six months; V, the whole year; diurnal tides; VI, effect of moon's declination; VII, moon's age; changes of mean level; VIII, height of high water referred to moon's age, first and second months; IX, monthly mean level.—[Sketches 27 (F, No. 4) and 28 (F, No. 5).]
1853	28	77–81	Notes on tides at Rincon Point, Cal.—A. D. Bache.—[Tables I to IV.]—[Sketch 48 (J, No. 7).]
1853	29	81–82	Notes on the tides at San Francisco, Cal.—A. D. Bache.
1853	.....	.....	Sandy Hook changes.—[Sketch 8 (B, No. 3).]
1853	38	94–96	Self-registering tide gauge, Saxton's.—E. B. Hunt.—[Sketch 54.]
1854	.....	.....	Craven's current indicator.—[Sketch 55.]
1854	14	21–23	Beaufort Harbor, North Carolina.—J. N. Maffit. Its capacity, changes, and improvements.—[Sketch 23.]
1854	29	35–37	Nantucket and Vineyard Sound tides.—H. Mitchell. Method of securing Mitchell's tide gauge; remarks on swells.—[Sketch 57.]
1854	30	37–40	Western coast tidal and magnetic observations.—W. P. Trowbridge.
1854	45	147–152	Cotidal lines, Atlantic.—A. D. Bache. Preliminary determinations of cotidal lines on the Atlantic coast of the United States, from Coast Survey observations. Table I, observations for cotidal hours; II, cotidal hours of ports on the Atlantic coast; III, rate and trend of cotidal lines.—[Sketch 26.]—[Errata, 151: 1855, p. xix.]
1854	46	152–155	Diurnal inequality, western-coast tides.—A. D. Bache. Comparison of the diurnal inequality of the tides at San Diego, San Francisco, and Astoria with tables.—[Sketch 49.]—[Errata, 153: 1855, p. xix.]
1854	48	161–166	On the currents of Nantucket Shoals.—C. A. Schott. On the currents of Nantucket Shoals, from Coast Survey current observations.—Table I, mean direction; II, maximum velocity; III, groups of luni-current intervals.—[Sketch 13 (A, No. 12).]—[Errata, pp. 165, 166: 1855, p. xix.]

PHYSICAL HYDROGRAPHY—Continued.

TIDES, CURRENTS, WINDS, AND SHORE-LINE CHANGES DUE TO THE ACTION OF THE SEA—Continued.

Year.	Appendix.	Pages.	Subject and author.
1854	49	166-168	*Muskeget Channel and Marthas Vineyard currents.*—C. A. Schott. Table showing the currents and rate of current in Muskeget Channel and *on the northeast coast of* Marthas Vineyard; velocity of current; duration of ebb, flood, and slack water; current-establishments.—[Sketch 14 (A, No. 13); also 1855, Sketch 6.]—[Errata, pp. 157, 168: 1855, p. xix.]
1854	50	168-179	Tides, Long Island Sound and approaches.—C. A. Schott. Table I, range, or mean rise and fall of tides, to April, 1853; II, corrected or mean establishments, to *April, 1853; III, set and maximum rates* of ebb and flood streams; IV, luni-current interval for beginning of *outgoing streams; eastern part of the Sound*, 1846-'47; western part of New York Bay and channel, 1844; New York Harbor, 1844-'45; Hell Gate, 1845; Hell Gate and Throgs Neck, 1846; V, mean duration of slack waters and of respective ebb and flood streams, from the middle (time) of one slack-water period to that of the next; VI, irregularity of luni-current intervals of successive tides.—[Sketch 16 (B, No. 2).]—[Errata, pp. 172, 174: 1855, p. xix.]
1854	52	189-190	Current-bottles. *One from Mobile Bay to Mosquito Inlet and one from Cape Florida to* Jupiter Inlet.
1854	53	190-191	Seacoast tide-gauge.—H. Mitchell. Description of tide-gauge used at stations on the open seacoast and in situations exposed to strong currents.—[Sketch 57.]—(*See, also*, 35-37.)—[Errata, for Sketch K read Sketch 57.]
1855	23	164-165	Sandy Hook changes.—[*See* New Jersey, etc.]—A. M. Harrison.—[Sketch No. 9.]
1855	24	170-171	*Remarks by Mr. Boschke* on surveys made at different periods in New York Harbor.
1855	33	222-223	Nantucket Sound.—H. Mitchell. Tidal observations; interference-phenomena.
1855	50	338-342	Pacific cotidal lines.—A. D. Bache. Tidal *observations.—Table I, tide stations on the* westerncoast of the United States; II, data for cotidal lines of the Pacific coast of the *United States; cotidal hours*; cotidal groups; III, discussion of the middle group between Cape Mendocino and Point Conception.—*Chart of* cotidal lines.—[Sketch 49.]
1855	51	342-346	Earthquake waves, Pacific Ocean.—A. D. Bache. Notice of earthquake waves on the western coast of the United States, December 23 and 25, 1854; computation of ocean depth.—[Sketch 50 (J, No. 9).]—Errata, pp. 342, 345: 1855, p xviii.]
1855	52	346-347	Gulf of Mexico *tides.—A. D. Bache.* Observations and type curves at the several stations, showing their decom*position into diurnal* and *semidiurnal* tides.
1856	34	249-251	Prediction tables.—A. D. Bache. Notes on the progress made in their preparation with reference to tides of Boston Harbor.
1856	35	252-260	Cotidal lines, Gulf of Mexico.—A. D. Bache. Discussion and preliminary *determination.—Table I, diurnal wave*; II, stations, etc.; III, diurnal intervals; IV, tide elements of the stations; V, *semidiurnal tides*; VI, *comparison of* establishments of diurnal and semidiurnal tides in the Gulf of Mexico.—[Sketches 35 and 36.]
1856	36	260-261	Type curves, Gulf of Mexico. Descriptive references to Sketch No. 38, representing the decomposition of curves of observations.—[Sketch 38.]
1856	37	261-263	Interference tides.—*H. Mitchell.* On observations made in Nantucket and Marthas Vineyard sounds.
1856	38	263-264	Tidal currents at Sandy Hook.—A. D. Bache. *Notes on the causes of* northwardly increase of the peninsula.—[Errata, p. 264: 1856, p. xx.]
1856	39	264-266	New York Harbor and dependencies.—H. Mitchell. On tidal and current observations made in New York Harbor, city docks, Newark Bay, and the Kills.
1856	40	266-267	Hudson River.—G. Würdemann. On tidal observations made between Albany and New York City.—[*Sketch 6.*]

PHYSICAL HYDROGRAPHY—Continued.

TIDES, CURRENTS, WINDS, AND SHORE-LINE CHANGES DUE TO THE ACTION OF THE SEA—Continued.

Year.	Appendix.	Pages.	Subject and author.
1856	43	271-272	Winds of Albemarle Sound.—L. F. Pourtales. Discussion of their effect upon the tides.—[Sketch 16.]
1856	44	272-276	Winds in the Gulf of Mexico.—A. D. Bache. Discussion relative to the disturbance caused in the intervals of successive tides at several stations on the Gulf coast.—Table I, quantity and direction of wind at Key West, Fla., 1851-'52; II, at Fort Morgan, Ala., 1847-'49; III, at Galveston, Tex.
1856	45	276-278	Winds and tides in Cat Island Harbor.—Results deduced by G. W. Dean, Assistant, from observations made by G. Würdemann and R. T. Bassett.—[Sketch 39.]
1856	46	279-280	Cards from current-bottles. Picked up on the shore of Loggerhead Key, Fla., and on the North Caicos, Bahamas.
1857	16	152-153	Beaufort Harbor, North Carolina.—C. R. P. Rodgers. Present condition of bar and anchorage.—[Sketches 29 and 30.]
1857	17	153-155	Cape Fear entrances, North Carolina.—J. N. Maffit. Elements of physical changes wrought.—[Sketch 33; also, 1855, Sketch 16.]
1857	33	342-347	Atlantic coast tides.—Generalization of heights relative to the configuration of the coast.—A. D. Bache. Table I (A), heights of tides on the Atlantic coast of the United States; II (B), on the coast of Cape Breton and New Brunswick.—[Sketch 65.]
1857	35	350-354	Tides and currents in the Nantucket and Vineyard sounds and in East River.—H. Mitchell. Hell Gate and vicinity, tides and currents; Hudson River levelings; Nantucket and Marthas Vineyard sounds, tides and currents.
1857	36	354-358	Winds on the western coast.—A. D. Bache. Table for deducing from the three daily observations the mean of the day, *quantities of wind, tables for Astoria, San Francisco, and San Diego*, and special wind statistics.—[Sketch 66.]
1857	37	358-373	New York Harbor; report of advisory council. Physical causes of changes: (1) Changes at Sandy Hook; (2) northern side of entrance, Coney Island and south shore of Long Island; (3) New York bar; (4) New York Upper Bay; (5) Newark Bay; (6) Hudson River; (7) East River to Throgs Neck; statistic extracts.—[Errata, p. 272: 1858, p. xx.]
1857	49	402-403	Tide gauge, Trenchard's. [Sketch 72.]
1857	50	403-404	*Tide gauge for deep water, Mitchell's.* [Sketch 72.]
1858	13	150-151	Cape Fear entrances.—T. B. Huger. Recent changes in hydrography.—[Sketches 12 and 13.]
1858	27	197-203	New York Bay and Sandy Hook.—A. D. Bache. On the character of the tidal currents in the vicinity of the bar: (1) Normal currents at the entrance to New York Bay; (2) False Hook Channel and the approaches; (3) currents of Sandy Hook Bay.—Tables I to IV, lunar time, duration, velocity, and direction of currents; V and VI, velocities corrected for diurnal and half-monthly inequalities.—[Sketch 39.]
1858	28	204-207	East River and New York Bay.—H. Mitchell. On the observations of surface and subcurrents.
1858	30	210-213	Cotidal lines of an inclosed sea, as derived from the equilibrium theory.—Benjamin Peirce. (1) General theory; (2) its modification by the incompleteness of the inclosure.
1858	31	213-216	Dynamics of ocean currents.—E. B. Hunt.
1858	38	247-248	Sounding apparatus and tide meter, proposed by E. B. Hunt.—J. M. Batchelder. Notes on its principles and application.
1859	26	311-317	New York Harbor.—H. Mitchell. On its physical survey, with description of apparatus for observing the currents.—[Sketch 40.]—[Errata, p. 317: 1860, p. xx.]

PHYSICAL HYDROGRAPHY—Continued.

TIDES, CURRENT, WINDS, AND SHORE-LINE CHANGES DUE TO THE ACTION OF THE SEA—Continued.

Year.	Appendix.	Pages.	Subject and author.
1859	28	320-321	Current cards thrown from the surveying steamer *Corwin*, and found on the eastern coast of Florida.
1859	35	365-366	Tide meter.—J. M. Batchelder. Results of experiments made with the apparatus devised by E. B. Hunt.
1860	41	399-402	Labrador expedition.—A. Murray. Report of a voyage of steamer *Bibb*, and remarks on the winds and tides.
1862	9	126-128	Cotidal lines of the Gulf of Mexico, deduced from recent observations.—A. D. Bache. Tables of diurnal and semidiurnal tides.—[Sketch 46.]
1862	24	238-241	Earthquake waves.—A. D. Bache. Reprint of a paper deducing the depth of the Pacific Ocean from the effect of the Simoda earthquake on the tide gauges in California and Oregon in 1854.—[Sketch 50.]
1864	6	57	Beaufort Harbor.—E. Cordell. Development of changes at the bar and in the channel.
1864	9	91-92	Tides at Tahiti, South Pacific Ocean.—Their general character.—J. Rodgers. [Sketch 40.]
1865	5	45	Entrance to Cape Fear River, North Carolina.—J. S. Bradford. Hydrographic changes.—[Sketch 13.]
1865	11	138	Explanation of diagram of type curves of the tides on the Pacific coast. [Sketch 26.]
1866	6	44-46	Hell Gate tides (East River, N. Y.).—H. Mitchell. Preliminary report on the interference tides of Hell Gate, with directions for reducing the soundings.—Table of relative elevations of tidal planes from observations; tides and currents of Hell Gate, from observations of 1857.
1866	18	113-119	Tidal observations at Cat Island, Gulf of Mexico: Notes of a discussion.—A. D. Bache. (Reprinted from the report for 1851.)—[Sketch 30.]
1853	26	67-70	Tide tables for the use of navigators, with description of bench marks, explanations and examples for use.—A. D. Bache.
1854	51	180-189	Tide tables for the use of navigators.—A. D. Bache.—[Errata, 181, 182, 183, 185: 1855, p. xx.]
1855	53	347-359	Tide tables for the use of navigators.—A. D. Bache.—[Errata, 349, 351, 353, 354, 358: 1857, p. xviii.]
1856	17	120-133	Tide tables for the use of navigators.—A. D. Bache.—[Errata, 130: 1856, p. xx.]
1857	20	157-178	Tide tables for the use of navigators.—A. D. Bache.
1858	43	275-297	Tide tables for the use of navigators.—A. D. Bache.—[Errata, 279: 1859, p. xvi.]
1859	14	136-167	Tide tables for the use of navigators.—A. D. Bache.—[Errata, 145: 1860, p. xx.]
1860	16	131-164	Tide tables for the use of navigators.—A. D. Bache.—[Errata 161: 1860, p. xx.]
1861	9	98-131	Tide tables for the use of navigators.—A. D. Bache.
1862	8	93-126	Tide tables for the use of navigators.—A. D. Bache.
1863	12	84-117	Tide tables for the use of navigators.—A. D. Bache.
1864	8	58-90	Tide tables for the use of navigators.—A. D. Bache.
1866	7	47-49	Predictions for Eastport, as a specimen.*
1867	12	149-157	Provincetown Harbor, Massachusetts.—Special survey.—H. L. Whiting.

*In 1866 was begun the separate publication of Tide Tables, predicting for one year in advance the tides on the Atlantic and Pacific coasts.

PHYSICAL HYDROGRAPHY—Continued.

TIDES, CURRENTS, WINDS, AND SHORE-LINE CHANGES DUE TO THE ACTION OF THE SEA—Continued.

Year.	Appendix.	Pages.	Subject and author.
1867	13	158-169	Tides and currents of Hell Gate, N. Y.—H. Mitchell. General scheme of tides and currents: (1) General scheme of tidal interference; observations and results; curves. (2) Tides from stations selected as characteristic for New York Harbor and its approaches, 1857-'58, with diagram; intervals and heights of tides from simultaneous observations, May and June, 1857, arranged according to hour of transit; curves of half-monthly inequalities. (4) Restoration of level between gauges at Hell Gate Ferry and Pot Cove, 1857; diagram. (5) Currents of New York Harbor; general scheme of currents, graphic.
1867	14	170-175	Merrimack River, Massachusetts.—H. Mitchell. Surveys respecting its navigation, with tables.—[Sketch 2.]
1867	15	176-179	Report on soundings made to develop the character of the Strait of Florida between Key West and Havana. By H. Mitchell.
1868	15	51-102	Discussion of the tides in Boston Harbor.—W. Ferrel. The observations and the locality; expression of the disturbing forces; tidal expressions; object and plan of discussion.—Tables I, II, III, and IV, of average normal values; V, the constant or mean tide; the semimonthly inequality; VI, inequality depending upon the moon's mean anomaly; VII, inequality depending upon the moon's longitude; VII *bis*, inequality depending upon the sun's anomaly and longitude; VIII, inequality depending upon the moon's node; IX, inequalities depending upon η_8 and η_9; diurnalt ide; recapitulation of results; comparisons with the equilibrium theory; determination of the general constants; comparisons with the dynamic theory; prediction formulas and Tables I-XI; computation of a tidal ephemeris; conclusion; example of the computation of a tidal ephemeris.
1868	6	103-108	Mode of forming a brief tide table for a chart, with example.—R. S. Avery.—[Sketch 29.]
1869	5	75-104	Reclamation of tide lands, and its relation to navigation.—H. Mitchell. (1) General discussion; scour of tidal and river currents; general rule of bar-scouring; parallel works; traverse works; physical history of salt marshes; shingle levees; other natural levees; Peirce's criterion; (2) field work; Green Harbor River; North River; tabular sections of shingle levees; sand beach; section of slueway formed by Minot's gale; general rise; local changes of heights of tide—tables; effect of a dam; general conclusions relative to the projects of reclamation; shore of Nahant; tabular sections; maps and diagrams (in text).
1869	13	233-234	Abstract of a paper read before the National Academy of Sciences, April 16, 1869, on the earthquake wave of August 18, 1868; wave table.—J. E. Hilgard.
1869	15	236-259	Reports concerning Marthas Vineyard and Nantucket.—H. L. Whiting and H. Mitchell. (A) Edgartown Harbor, changes; Vineyard Haven, its character as a port of refuge and its present condition; Table I, exposure of anchorages in Provincetown Harbor; II, in Vineyard Haven; III, in Great Woods Hole; IV, in Tarpaulin Cove; V, in Edgartown Roadstead; VI, in Old Stage Harbor; VII, in New Bedford Harbor and Quick's Hole; VIII, in Plymouth Harbor; IX, in Boston Harbor and Nantasket Roads; X, in Boston Harbor and Hull Bay; XI, in Boston Harbor and Presidents Roads and Georges Roads; XII, in Marblehead Harbor; XIII, at Salem Harbor; XIV, at Gloucester Harbor; XV, in Lower Bay, New York Harbor; XVI, in Upper Bay, New York Harbor; XVII, anchorage room and average exposure in the respective harbors. (B) Surveys of summer, 1871: (1) Physical aspect and peculiarities; (2) Edgartown tides, difference of heights; (3) Nantucket tide tables; (4) elements of the field work.
1870	5	66-69	Tabular statement of results of computed tide tables for charts of the western coast of the United States.—R. S. Avery.
1870	6	70-74	Mode of forming brief prediction tide tables.—R. S. Avery.
1870	10	92-97	Description of bench marks at tidal stations.
1870	11	98-99	Extract from a report relative to a method of determining elevations along the course of a tidal river, without the aid of a leveling instrument, by setting up graduated staves at such distances apart that the slacks of the tidal currents extend from one to another.—Rule: The difference in the elevations of the zeros of the gauges is equal to one-half the sum of the differences of their readings at the two slack waters.—Henry Mitchell.

PHYSICAL HYDROGRAPHY—Continued.

TIDES, CURRENTS, WINDS, AND SHORE-LINE CHANGES DUE TO THE ACTION OF THE SEA—Continued.

Year.	Appendix.	Pages.	Subject and author.
1870	18	180-181	On the probable effect of extended piers in modifying the channel facilities of San Francisco Bay near Yerba Buena Island.—Henry Mitchell.
1870	20	190-199	On the moon's mass, as deduced from a discussion of the tides of Boston Harbor.—William Ferrel.
1871	6	93-99	Meteorological effect on tides.—William Ferrel. Graphic representation of the relative amounts and direction of the wind for each of the four seasons for Boston.
1871	7	100-108	Meteorological register, St. Paul Island, Alaska, 1870-'71. By Capt. Charles Bryant, special agent Treasury Department.
1871	8	110-133	Harbor of New York, 1873.—Henry Mitchell. Increase of Jersey Flats; diagram A; changes in Buttermilk Channel; changes in the vicinity of Middle Ground Shoal and Gowanus Bay; changes at and near the Sandy Hook entrance; tides and currents; phenomena in the pathway of the Hudson; movement through East River; East River and Hudson tidal current compared; relations of East River movements to those over the bar; Tables 1 to 17; diagrams B, C, D.—[Sketches 30, 31, 32.]
1871	9	134-143	Nauset Beach and Monomoy Peninsula.—H. Mitchell. Physical history of the neighborhood of Monomoy (Sketch No. 35); recent movement of Chatham Beach in detail; tables.
1871	10	144-153	Location of harbor lines.—Henry Mitchell. Value of tidal volume; encroachment on the channels; isodynamic lines (Sketch No. 35); example; anchorage and winding room; requisite depths of frontage; length of slips; riparian rights; laws establishing harbor lines.
1872	6	69-72	Field and office work relating to tides.—R. S. Avery.
1872	7	73, 74	Maxima and minima of tides on the coast of New England for 1873.—William Ferrel.
1872	10	177-212	Harbors of Alaska and the tides and currents in their vicinity.—W. H. Dall.—[Sketch No. 18.] Statistics; notes on the North Pacific current; hydrographic notes on Captains Bay and vicinity; meteorology of Unalashka; tides of Iliuliuk; compound tides; semidiurnal tides; tide referred to the lower transits; to the upper transits; semidiurnal tides; tidal current of Unalashka; the Alaska current; its effect on the climate of the Aleutian district; the circular current of Bering Sea; the Shumagin Islands; western; eastern; miscellaneous hydrographic notes; meteorological observations from September, 1871, to October, 1872; current observations; tides of Iliuliuk.
1872	16	257-261	Middle-ground shoal, New York Harbor.—H. Mitchell. Tables of current observations.—[Sketch No. 22.]
1872	17	262-265	Shore-line changes at Edgartown Harbor, Mass.—H. L. Whiting.—[Sketch No. 23.]
1873	8	94-102	Physical survey of Portland Harbor.—H. Mitchell. Correspondence; sections 1 to 10 for velocities of tidal current; diagrams of the ten sections.
1873	9	103-107	Additional report concerning the changes in the neighborhood of Chatham and Monomoy.—H. Mitchell. The real point of interest; corrections of previous paper; results of the last survey, tables, diagrams.
1873	10	108, 109	Changes in the submerged contours off Sandy Hook.—[Tables, diagram.]—Henry Mitchell.
1874	12	135-147	Terminal points of the proposed canals through Nicaragua and the Isthmus of Darien.—H. Mitchell. Greytown; history of the harbor; causes of its decline and final destruction; the work of restoration; obstructions of the Lower San Juan; recapitulation; result of foregoing discussion; Urabá mouth of the Atrato; conclusions relative to the improvement of the Urabá; Brito; conclusions; Limon and Chiri Chiri bays; general exposure.
1874	.....	268	Tidal researches.—William Ferrel.—(Four illustrations.)
1874	16	154	Ocean salinometer.—J. E. Hilgard.
1874	.....	16	On the air contained in sea water.—By Oscar Jacobsen. Republished for the U. S. Coast Survey from Annals, Ch. and Ph., Vol. 167, 1873.

PHYSICAL HYDROGRAPHY—Continued.

TIDES, CURRENTS, WINDS, AND SHORE-LINE CHANGES DUE TO THE ACTION OF THE SEA—Continued.

Year.	Appendix.	Pages.	Subject and author.
1875	11	189-193	Recent observations at South Pass Bar, Mississippi River.—[Sketch No. 24; tables.]—H. Mitchell.
1875	12	194-221	Discussion of tides in New York Harbor.—William Ferrel. General plan and immediate object of the discussion; adopted notations; averages deduced from the observations; Tables I to VI; semidiurnal tides, half-monthly inequality; lunar parallactic inequality; mean lunar declinational inequality; lunar nodal inequality; solar declinational and parallactic inequalities; mean sea level; diurnal tide; Table VII; comparison of theory with observation; practical application; directions for computing a tidal ephemeris. Appendix: Tables I to IV, for computing heights and times of high water; example.
1875	18	293-314	Observations on certain harbor and river improvements collected on a voyage from Hongkong, via Suez, to New York.—George Davidson. Nagasaki; Shanghai; Hongkong; Canton; Singapore; Penang; Calcutta; Bombay; Suez and canal; destructive action by passing vessels; current through the canal; saltness of water; tides; breakwater at Port Said; dredging, estimate of cost; Alexandria; Naples; Genoa; Swinemunde; Copenhagen; Kiel; Hamburg; Bremerhafen; Wilhelmshafen; Amsterdam Canal; entrance locks and sluices; the béton blocks; North Sea Harbor Breakwater; design; method of building; dam at Schellingwonde, eastern extremity of the Amsterdam Canal; difficulties of construction; Cherbourg; docks; breakwater; Brest; docks; Admiralty Pier, Dover; construction; cost; Portland Breakwater; riprap; description; cost; Holyhead Breakwater; Alderney Breakwater; conclusions; fascinage for breakwater foundations; river improvements.
1875	20	369-412	Meteorological researches for the use of the Coast Pilot.—[Sketches 31 to 37.]—William Ferrel. Prefatory note by C. P. Patterson, Superintendent. Part I. On the mechanics and general motion of the atmosphere. Chapter I. General equations of the motions and pressure of the atmosphere. 379 Chapter II. The temperature and pressure of the atmosphere at the earth's surface obtained from observation; Tables I to V; Tables VI to X, of distribution of atmospheric pressure. 402 Chapter III. The general motion of the atmosphere; Table XI, velocities; Table VII, direction and velocities. [Errata, §§ 8, 9, 13, 15, 42.]
1876	22	800	On tides and tidal action in harbors.—By Prof. J. E. Hilgard. Reprinted from Smithsonian Report for 1874.
1876	8	130-142	Methods of registering tidal observations.—R. S. Avery. Bench-marks; tide-gauges; self-registering tide-gauges; diagrams; how to use three roller gauge; large cylinder gauge; tabulating high and low water; hourly readings; scales of heights; time, precautions.
1876	9	143-146	Changes in the harbor of Plymouth, Mass.—H. Mitchell. [Sketch No. 22.] Champlain (1605); Blaskowitz (1774); general conclusions and remarks.
1876	10	147-185	Physical survey of New York Harbor.—H. Mitchell. Section XXXVI, Table A; positions of origins and termini of sections examined in 1872-'73-'74-'75; transverse curves of velocity, and perimeters; Sections I to XXXVII.
1876	11	186-189	Report concerning the location of a quay or pier line in the vicinity of the United States navy-yard at New York.—Henry Mitchell. Sections VI to VIII.—[Sketch No. 23.]
1876	12	190-191	Review of the characteristics of South Pass, Mississippi River.—Henry Mitchell.
1877	8	98-103	Alleged changes in the relative elevations of land and sea.—Henry Mitchell. Salt marshes; rocks; Percé Rock; Isle Percé; Green Ledge; Mary Ann Rocks; Bulwark Shoal; Drunken Ledge; Brazil Rock; Jig Rock; Trinity Ledge; Harding's Ledge; Great Ledge.
1877	9	104-107	Apparatus for observing currents.—H. L. Marindin. Description of floats; diagram.
1877	10	108-113	Optical densimeter for ocean water.—J. E. Hilgard, Assistant in charge of office.
1877	14	184-190	Density of the waters of the Chesapeake Bay and its principal estuaries.—Lieut. Frederick Collins, U. S. N., Assistant. Instruments employed; specific gravity; method of working; explanation of tables in the full report.

PHYSICAL HYDROGRAPHY—Continued.

TIDES, CURRENTS, WINDS, AND SHORE-LINE CHANGES DUE TO THE ACTION OF THE SEA—Continued.

Year.	Appendix.	Pages.	Subject and author.
1878	9	121-175	Physical survey of the Delaware River at Philadelphia.—Henry Mitchell, Assistant. The channel; form of cross-section; section 7½, Southwest Pass, Mississippi River; diagram A; the Delaware; *location of the channel*; cross-section; diagram B; table; diagram C; tables; tables of transverse *curves of velocity; diagram D.*
1878	10	176-267	Meteorological researches for the use of the Coast Pilot.—William Ferrel. Part II. On cyclones, waterspouts, and tornadoes. Chapter I. The theory of cyclones. 206 Chapter II. Practical application of the theory and comparison with observation. 243 Chapter III. Tornadoes, hail storms, and waterspouts.—[Sketches Nos. 33 to 38.]
1878	11	268-304	Tides in Penobscot Bay.—William Ferrel. I, *general principles of the harmonic analysis and discussion of tide observations.* II, p. 284, analysis of the tides of Pulpit Cove. III, p. 296, comparison of observations with theory. IV, p. 599, practical application.
1879	10	175-190	Physical hydrography of the Gulf of Maine.—H. Mitchell, Assistant. General description; tides and tidal currents; Tables 1 to 7; George's Bank; *Tables 8, 9.*
1879	13	199	*Addendum to a report on a physical survey of the Delaware River.*—Henry Mitchell, Assistant.
1880	.....	1-221	Deep-sea sounding and dredging. A description of the methods and appliances used on board the Coast and Geodetic Steamer *Blake.*—By C. D. Sigsbee, Lieutenant-Commander U. S. N., Assistant.—(41 plates, 13 wood cuts.)
1880	9	110-125	Comparison of the surveys of Delaware River in front of Philadelphia, *1843 and 1878.*—H. L. Marindin, Assistant. Tables 1, 2. Supplement, p. 116; Tables 3 to 10.
1880	10	126-134	Comparison of surveys of Mississippi River in the vicinity of Cubitt's Gap.—H. L. Marindin, Assistant. Tables 1 to 5.—[Sketch No. 44.]
1880	16	297-340	Bering Sea.—W. H. Dall, Assistant. Report on the currents and temperatures, and also those of the adjacent waters; *sources of information; surface temperature; tables of temperatures*; pack ice; summer temperatures; the Kuro Siwo and its *extensions; table of North Pacific Sea temperatures*; comparison of sea temperatures from observations by the Challenger, 1873 and 1875; currents of Bering Sea; observations of the Tuscarora and Venus; those of Krusenstern, 1804-1806; notes by whalers and others; table of temperatures; of currents; observations off the coast of Asia; in the Arctic in general; in the vicinity of Point Barrow. SUPPLEMENTARY NOTE.—Additional observations in the Arctic Sea; boundary *line between the territory of the United States and Russia*; diagram of surface and vertical isotherms; chart of currents.
1881	18	464-469	Report on a new rule for currents in Delaware Bay and River.—By Henry Mitchell, Assistant. Proposed new rule for the currents of Delaware River; currents of Delaware Bay; "Station No. 4," outside of Cape Henlopen—lighthouse bearing nearly west by compass; diagram *showing manner of computing* middle line; rule; table of currents of Delaware Bay; table of currents of *Delaware River; note relative to the lines of high* and low water in Delaware Bay and River; progress of tide in Delaware *Bay and River.*
1882	15	427-432	Comparison of the survey of Delaware River of 1819, between Petty's and Tinicum Islands, with more recent surveys.—By Henry L. Marindin, Assistant. Different cross-sections compared and changes noted.—[Sketches 41, 42, 43.]
1882	16	433-436	Study of the effect of river bends in the Lower Mississippi.—By Henry Mitchell, Assistant. *Introductory remarks; inductions;* Table I, a comparison of air-line and river distances with mean depths, mean widths, and mean areas in Mississippi River, beginning in latitude 39° 20′ 46″, longitude 89° 24′ 15″, and ending in latitude 30° 06′ 36″, longitude 90° 54′ 47″; supplementary table; Table II, bend effects in the Mississippi River from 4½ miles below Fort Saint Philip to near Point Houmas, 150¾ miles; inferences; authority for data.—[Sketch 44.]

PHYSICAL HYDROGRAPHY—Continued.

TIDES, CURRENTS, WINDS, AND SHORE-LINE CHANGES DUE TO THE ACTION OF THE SEA—Continued.

Year.	Appendix.	Pages.	Subject and author.
1882	17	437-450	Discussion of the tides of the Pacific Coast of the United States.—By William Ferrel. Introductory letters; tides of Port Townsend discussed; tides of Astoria discussed; tides of San Diego discussed; determination of the general constants.—[Sketches Nos. 45, 46, 47.]
1883	8	239-245	The estuary of the Delaware.—By Henry Mitchell, Assistant. Introductory remarks; term estuary defined; table of half-tide dimensions of the estuary of the Delaware; diagram representing mean depths, widths, and sectional areas for each nautical mile; table giving progress of the tide in Delaware Bay and River; discussion concerning tide; résumé of data used; estuary of the Delaware; table of widths, areas, and depths.—[Sketch 25.]
1883	9	247-251	Report on the harmonic analysis of the tides at Sandy Hook.—By William Ferrel. Introductory letter; results of the harmonic analysis of the tides at Sandy Hook; this subject discussed.—[Sketch No. 26.]
1883	10	253-272	Description of a maxima and minima tide-predicting machine.—By William Ferrel. Prefatory letter; introduction; mathematical theory of the tide-predicting machine; mechanical solution of the problem; construction of the machine; directions for setting and using; efficiency of the machine; Appendix.—[Sketches Nos. 27, 28, 29, 30, 31.]
1884	12	431-434	Physical hydrography of Delaware River and Bay.—Comparison of recent with former surveys.—By H. L. Marindin, Assistant. Comparison of cross sections; Table No. 1, changes in Delaware River between 1841 and 1881; Table No. 2, changes in Delaware River between 1840 and 1882.—[Sketches Nos. 22, 23.]
1885	12	487-488	Comparison of transverse sections in the Delaware River between Old Navy Yard and east end of Petty's Island, for the years 1819, 1843, and 1878.—By Henry L. Marindin, Assistant. Explanation of sketches Nos. 29, 30, 31, 32, 33, 34, giving a comparison of the transverse sections of the Delaware at various points for the years 1819, 1843, 1878.
1885	13	489-493	On the harmonic analysis of the tides at Governor's Island, New York Harbor.—By William Ferrel. Results of the analysis with sketch showing positions of tide gauges at Governor's Island and Sandy Hook; determination of general constants.—[Illustration 35.]
1885	14	495-501	Report on deep sea current work in the Gulf Stream.—By J. E. Pillsbury, Lieut., U. S. N., Assistant. (*See* Gulf Stream explorations.)
1886	8	255-261	A report on Monomoy and its shoals.—By Henry Mitchell, Assistant. Tonnage of the vessels navigating these waters; dangers to navigation; comparison of Capt. Paul Pinkham's survey of 1784 and the U. S. Coast and Geodetic Survey chart of 1885, with a sketch of the two surveys. Also a report concerning the earliest topographical survey of Monomoy, with sketch.—By Charles O. Boutelle, Assistant.
1886	9	263-266	Report of changes in the shore line and beaches of Martha's Vineyard, as derived from comparisons of recent with former surveys.—By Henry L. Whiting, Assistant. Changes discussed; map showing changes in Cotamy Beach, from surveys made in 1846, 1856, 1871, and 1886.—[Illustration 21.]
1886	10	267-279	A report on the Delta of the Delaware.—By Henry Mitchell, Assistant. Joe Flogger Shoal; method of comparing old and new surveys; diagram showing cross section of Joe Flogger Shoal; results of comparisons; table giving comparative dimensions of Joe Flogger Shoal; also a table for lower channel (Blake's) near Joe Flogger Shoal, and a table for upper or main channel, near Joe Flogger Shoal.—[Illustration 22.]
1886	11	281-290	A report of Gulf Stream explorations.—Observations of currents, 1886.—By J. E. Pillsbury, Lieut., U. S. N., Assistant. (*See* Gulf Stream explorations.)

PHYSICAL HYDROGRAPHY—Continued.

TIDES, CURRENTS, WINDS, AND SHORE-LINE CHANGES DUE TO THE ACTION OF THE SEA—*Continued.*

Year.	Appendix.	Pages.	Subject and author.
1886	13	409–433	On the circulation of the sea through New York Harbor.—By Henry Mitchell, Assistant. Diagram A, types of the tidal profiles; field work of 1886; recapitulation; current observations, taken by the Naval parties October, 1886; East River tides and tidal currents; diagram B, *East River tides*; table giving lunar intervals of upper and lower restorations of level *between Governor's Island and Willet's Point*, with synchronous heights at other stations, from eight tides, October 4 to 6, 1886; *diagram* C, *maximum* and minimum slopes; table giving a comparison of restorations of level; maximum slope (by reaches) of the East River, October 4 to 6, 1886; comparison of slopes, Governor's Island to Willet's Point; intervals and heights of restoration of level between New York Harbor (Governor's Island) and Long Island Sound (Willet's Point), from observations made in October, 1886; *diagram* D, of currents; tables of variations of slope and velocity; diagram E shows variations of slope and velocity in East River; miscellaneous; table showing the decomposition of tides; diagram F, decomposition *of tides graphically represented*; comparison of mean levels, Governor's Island and Willet's Point; concluding remarks.—[Illustrations 34–39.]
1887	6	159–163	On the movements of the sands at the eastern entrance at Vineyard Sound.—By Henry Mitchell, Assistant. A continuation of the discussion of the changes among the Monomoy Shoals; table of tides and currents at the *entrance of* Vineyard Sound; *diagram* I, *entrance* to Vineyard Sound; composition of tidal forces; diagram II, tides *at entrance* of Vineyard Sound graphically represented; concluding remarks.—[Illustrations 31, 32.]
1887	7	165–172	Fluctuations in the level of Lake Champlain and average height of its surface above the sea.—By Charles A. Schott, Assistant. Introductory remarks; fluctuations of the level of Lake Champlain, as shown by monthly means from daily observations made by the United States Engineers at Fort Montgomery, N. Y., between the years 1871 and 1882; fluctuations in the level of Lake Ontario, shown by monthly *means from observations* at Charlotte Harbor as a representative station, between the years 1859 and 1881; comparison of the state of Lake Champlain with the amount of rain (and melted snow) during the years 1871–1882; table showing effect of wind; secular variation in the level of Lake Champlain; diagram showing annual variation in the level of Lake Champlain and Lake Ontario, with annual variation in rain fall; diagram showing secular variation in the levels of the two lakes; absolute height of *Lake Champlain above the ocean*; probable uncertainty of this result.—[Illustration 33.]
1887	8	173–184	Gulf Stream explorations; observations of currents, 1887.—By J. E. Pillsbury, *Lieut. U. S. N., Assistant.* (*See* Gulf Stream explorations.)
1887	13	269–273	Addendum to Appendix No. 8, report of 1883, on the estuary of the Delaware; table giving physical elements of the estuary of the Delaware, with introductory letter.—By Henry Mitchell, Assistant.
1887	15	301–311	Report on the results of the physical surveys of New York Harbor.—By Henry Mitchell, Assistant. Introductory letter: Part 1—The underrun of the Hudson River; its relation to New York bar; *diagram* A; underrun in the Hudson in the dry season; tables giving densities at different depths, from *observations taken in the summer* of 1885; diagram giving currents at different depths in various localities; table giving currents at different depths, from observations for 1885; table giving currents on the outer slope of New York Harbor, 1885; table giving depth of neutral plane below surface; limit of the tide, as affecting the scour of the channels in New York Harbor; *recapitulation*. Part 2—Courses of the Hudson tides through New York Harbor; table of slopes of the Hudson and East rivers; this subject discussed; diagrams of tides (synchronous) in the tract of the Hudson.—[Illustrations 44–49.]
1888	.....	7–12	Bulletin No. 3. Abstract of following paper, bearing same title and with 2 illustrations. (Superseded by second edition, published in 1889.)
1888	9	405–408	Tidal levels and flow of currents in New York Bay and Harbor.—By H. L. Marindin, Assistant.—[12 illustrations.]
1889	.....	41–43	Bulletin No. 8. Currents in New York Bay and Harbor. (Second edition.)

PHYSICAL HYDROGRAPHY—Continued.

TIDES, CURRENTS, WINDS, AND SHORE-LINE CHANGES DUE TO THE ACTION OF THE SEA—Continued.

Year.	Appendix.	Pages.	Subject and author.
1889	.....	143-146	Bulletin No. 12. A siphon tide gauge for the open seacoast.—By H. L. Marindin, Assistant.
1889	12	403-407	Encroachment of the sea upon the coast of Cape Cod, Mass., as shown by comparative surveys.—By H. L. Marindin, Assistant.—[1 illustration.]
1889	14	450-460	Recent changes in the south inlet into Edgartown Harbor, Martha's Vineyard.—By H. L. Whiting, Assistant. [1 illustration.]
1889	16	467-477	Gulf Stream explorations; observations of currents, 1888-'89.—By J. E. Pillsbury, Lieutenant U. S. N., Assistant.—(*See* the sub-heading Gulf Stream explorations.)
1890	10	461-620	The Gulf Stream; a description of the methods employed in the investigation and the results of the research.—By Lieut. J. E. Pillsbury, U. S. N., Assistant.—[25 illustrations and 12 figures.] (*See* abstract under Gulf Stream explorations.
1890	11	620-623	Report in relation to a portion of boundary line in dispute between the States of Maryland and Virginia.—By Henry L. Whiting, Assistant. NOTE.—The portion of the boundary line to be examined and located was near Hog Island, in the Lower Potomac, and its course depended upon the method adopted of measuring the low-water line of the river.
1890	14	691-703	On the use of observations of currents for prediction purposes.—Report by John F. Hayford, Tidal Division.
1890	15	705-714	Comparison of the predicted with the observed times and heights of high and low water at Sandy Hook, N. J., during the year 1889.—[2 illustrations.]—A report by A. S. Christie, Chief of the Tidal Division.
1890	.....	175-177	Bulletin No. 18. Table for the reduction of hydrometer observations of salt-water densities.—By O. H. Tittmann, Assistant. NOTE.—A second edition of this paper is to be prepared by Mr. Tittmann as an Appendix to the Report for 1891.
1891	.....	233-235	Bulletin No. 24, 1891. Changes in the shore line and anchorage areas of Cape Cod (or Provincetown) Harbor, as shown by a comparison of surveys made between 1867 and 1890. Abstract of a report by Henry L. Marindin, Assistant. Submitted for publication March 28, 1891.
1891 Pt. 2.	8	283-288	On the changes of the shore line and anchorage areas of Cape Cod (or Provincetown) Harbor, as shown by a comparison of surveys made between 1835, 1867, and 1890.—By H. L. Marindin.—[2 illustrations, Nos. 11 and 12.]
1891 Pt. 2.	9	289-341	Cross sections of the shore of Cape Cod, Mass., between the Cape Cod and Long Point lighthouses.—By H. L. Marindin.
1891 Pt. 2.	10	343-364	On observations of currents with the direction-current meter in the straits of Florida and in the Gulf of Mexico, 1891.—By E. E. Haskell.—[9 illustrations, Nos. 13 to 21.]
1892 Pt. 2.	5	225-241	On the tides and currents in the harbor of Edgartown and in Katama Bay, Martha's Vineyard.—By H. L. Marindin.—[4 illustrations, Nos. 20 to 23.]
1892 Pt. 2.	6	243-252	On the changes of the ocean shore lines of Nantucket Island, Mass., from a comparison of surveys made in the years 1846 to 1887 and in 1891.—By H. L. Marindin.—[4 illustrations, Nos. 24 to 27.]
1894 Pt. 2.	7	125-262	Manual of Tides. Part III. Some connections between harmonic and non-harmonic quantities, including applications to the reduction and prediction of tides.—By Rollin A. Harris.—[3 illustrations, Nos. 4 to 6, and 1 diagram.]
1895 Pt. 2.	5	347-369	Report on the changes in the depths of the bar at the entrance to Nantucket inner harbor, Mass., between the years 1888 and 1893.—By H. L. Marindin.—[4 illustrations, Nos. 29 to 32.]
1896	8	305-346	Tables of cross sections on the north shores of Nantucket and Martha's Vineyard, Mass.—By H. L. Marindin, Assistant.

PHYSICAL HYDROGRAPHY—Continued.

GULF STREAM EXPLORATIONS.

Year.	Appendix.	Pages.	Subject and author.
1846	4	46-53	Letters on the exploration of the Gulf Stream.—Lieutenant Commanding George M. Bache.
1847	11	75	Table showing temperatures at depths below 700 fathoms, taken by Lieutenants Commanding C. H. Davis in 1845, George M. Bache in 1846, and S. P. Lee in 1847.—(*See* Sketch.)
1853	.....	46-51	Gulf Stream explorations.—(Report.)—[Sketches 15 and 16.]
1853	30	82-83	Examination of specimens of bottom obtained in Gulf Stream.—L. F. Pourtales.
1854	47	156-161	Gulf Stream temperatures.—A. D. Bache. On the distribution of temperatures on and near the Gulf Stream: (1) At different depths; (2) at the same depths on sections across the axis of the Gulf Stream, Table I, probable uncertainty in determination of the maximum and minimum points; (3) connection of the figure of the sea bottom with the distribution of temperature; (4) the "cold wall;" (5) reference to shifting; (6) chart of Gulf Stream.—[Sketches 24 and 25.]—[*Errata*, pp. 158, 159, 160; 1855, xix.]
1855	.....	53-55	Gulf Stream exploration.—(Report.) Programme, Craven's Cape Florida section; soundings by Sands along the Gulf Stream axis; depths; bottom configuration, temperatures, and bottoms.
1855	.....	84	Gulf Stream deep sea soundings.—(Report.)—[Sketch 38 (II, No. 3).]
1855	54	359	Bottle paper. Current bottle card thrown over near Sandy Hook and picked up at the bar at Santa Cruz, one of the Western Islands.
1855	55	360	Gulf Stream bottoms.—J. W. Bailey. On the characteristics of some bottoms from the Cape Florida Gulf Stream section.
1858	32	217-222	Florida Gulf Stream.—E. B. Hunt. Notices of certain anomalies; changes of current depending upon the winds and seasons.
1858	39	248-250	Analysis, microscopical, of specimens of bottom taken in soundings.—L. F. Pourtales. Green and ochraceous incrustation of *Foraminifera*, and jet tint of specimens.
1859	25	306-310	Gulf Stream.—Distribution of temperature in the water of the Florida channel and straits.—A. D. Bache. Form of bottom; change of temperature with depth; temperature in a direction across the stream; bands of warm and cold water; the "cold wall;" longitudinal section; effects of pressure on Saxton's deep-sea thermometer, under pressure and free from pressure; thermometers Nos. 5 and 10.—[Sketch 35.]
1860	17	165-176	Gulf Stream.—A. D. Bache. General account of the methods used in developing its hydrography, and summary of results obtained: (1) instruments for temperatures; for depth; for obtaining specimens of the bottom; (2) plan of the work; (3) method of discussion of results; (4) results; type curves of law of temperature, with depth at the most characteristic positions; type curves of law of distribution of temperature across the stream; curves of temperature at the same depths; curves of depths at the same temperatures.—Table I, distance of the cold wall from the shore, and widths of the several bands of cold and warm water of the Gulf Stream, measured on the lines of the sections; (5) limit of accuracy of the determinations; II, probable uncertainty in the determination of maximum and minimum points by running the same sections over in different years, by different observers; III, value of probable error of determination of the bands for each section and the average of the whole; (6) figure of the bottom of the sea below the Gulf Stream; (7) general features of the Gulf Stream.—[Sketches 19 to 22.]
1867	15	176-179	Soundings in the Gulf Stream between Key West and Havana.—H. Mitchell. Table I, soundings in the Gulf Stream near the coast of Cuba, 1867; II, current observations.—[Sketch 25.]—(Supplement, 1868, pp. 166-167.)
1867	16	180-182	Fauna of the Gulf Stream.—L. F. Pourtales. Dredgings in the Straits of Florida.

PHYSICAL HYDROGRAPHY—Continued.

GULF STREAM EXPLORATIONS—Continued.

Year.	Appendix.	Pages.	Subject and author.
1868	11	166-167	Note on Gulf Stream observations.—H. Mitchell. Decrease of bottom temperature in still-water channels.—(Sequel to 1867, p. 179.)
1868	12	168-170	Report upon dredgings near the Florida Reef.—L. F. Pourtales. Organic specimens; corals, echinoderms, brachiopods, etc.
1869	10	208-219	Report upon deep-sea dredgings in the Gulf Stream during the third cruise of the United States Steamer *Bibb*.—L. Agassiz. Fauna of the submarine zones; reef zone; sedimentary zone; coral slope of living cretacean types; floor of foraminiferine mud; geological inferences; inclination of the reefs; pot holes; formation of oölithic, amorphous, and compact limestones; the Jurassic submarine seam; embryology of corals and formation of colonies by disk embranchment; extinct forms representing modern developmental transitions; lines to be dredged.
1869	11	220-225	The Gulf Stream.—Characteristic of the Atlantic sea bottom off the coast of the United States.—L. F. Pourtales. Manner of dredging; silicious formation; green sand formation.
1882	19	459-461	Recent deep-sea soundings off the Atlantic Coast of the United States.—[With references to development of bed of the Gulf Stream.]—By J. E. Pillsbury, Lieutenant U. S. N., Assistant. (One illustration.)
1885	14	495-501	Report on deep-sea current work in the Gulf Stream.—By J. E. Pillsbury, Lieutenant, U. S. N., Assistant, Coast and Geodetic Survey. Letters of instruction; report; description of apparatus devised by Lieut. Pillsbury for observations of deep-sea currents, with diagram and detailed account of its use; observations made, and lines run; chart showing locality of cross section A, between Fowey Rocks and Gun Cay; charts showing positions of current stations, cross section A, Gulf Stream; illustrations 39 to 46, giving a graphic picture of the deep-sea current work.
1886	11	281-290	A report of Gulf Stream explorations.—Observations of currents, 1886.—By J. E. Pillsbury, Lieutenant U. S. N., Assistant. Detailed report of season's work, with a treatment of the subject, under the following heads: I. General characteristics of the Gulf Stream, as developed by the observations. II. Daily variation of the stream. III. Monthly variation of the stream. IV. Axis of the stream. V. Effect of wind on the velocity of the stream, and the position of its axis. VI. Depth of the stream, and velocity at different depths. VII. General summary for the guidance of navigators. Plates (23 to 28) presenting curves of observations of currents in the Gulf Stream during 1885 and 1886.
1887	8	173-184	Gulf Stream explorations.—Observations of currents, 1887.—A report by Lieut. J. E. Pillsbury, U. S. N., Assistant. Detailed report of seasons's work; sections occupied, CC, between Rebecca Shoal and Cuba; DD, between Cape San Antonio, Cuba, and Yucatan; and section F, from Cape Hatteras Shoal in a direction nearly southeast; a treatment of the subject in the following order: (1) General characteristics and limit of the stream at each cross section. (2) Daily variation. (3) Axis of the stream. (4) Depth of the stream, and velocity at different depths. (5) Comparison of results obtained at various sections.—[Illustrations 34-42.]
1889	16	467-477	Gulf Stream explorations.—Observations of currents, 1888-1889.—By Lieut. J. E. Pillsbury, U. S. N., Assistant, U. S. Coast and Geodetic Survey.—(20 illustrations.)
1890	10	461-620	The Gulf Stream.—A description of the methods employed in the investigation and the results of the research.—By Lieut. J. E. Pillsbury, U. S. N., Assistant.—(25 illustrations and 12 figures.) Preface; introduction; general historical account of the Gulf Stream and its investigation up to the time of Franklin; Gulf Stream investigations from the time of Franklin to those made by the U. S. Coast Survey; Gulf Stream investigations made by the U. S. Coast Survey until 1884 and those contemporary with them; outfit of the *Blake* for anchoring at sea and observing the currents; characteristics of the Gulf Stream in the Straits of Florida and in the Yucatan Passage; the Gulf Stream off Jupiter Inlet and Cape Hatteras; the equatorial current; causes of the Gulf Stream and of Atlantic currents; conclusions; index.

PHYSICAL HYDROGRAPHY—Continued.

DEEP-SEA SOUNDINGS, TEMPERATURES, AND DENSITIES.

Year.	Appendix.	Pages.	*Subject and author.*
1854	54	191–192	Craven's specimen box for deep-sea bottoms.—T. A. Craven. [*Sketch* 56.]
1857	46	398	Deep-sea sounding apparatus.—Description of a form proposed and used by B. F. Sands. [Sketch 70.]
1857	.....	.....	Berryman-Brooke's deep-sea sounding apparatus. [*Sketch* 71.]
1858	37	228–246	Deep-sea soundings.—W. P. Trowbridge. Investigation of the laws of motion governing the descent of the weight and line; formulæ of velocity of descent—Table I, rates of descent and resistance, in pounds, upon the sinker and line, with one and with two 32-pound shot, attached to a line 0.07 of an inch in diameter; II, same, with 96 and 126 pound weights, deap-sea line; III, influence of different lengths of line moving with the same velocity; ratios of lengths to ratio of resistances; VII, comparison of resistances upon the same lengths of lines of different diameters, moving at the same velocity; VI, *influence of lengths at different depths*; VIII, same, continued; IX, rates of descent, velocity, resistance to sinker and line, and weight of line in water, from observations made by Joseph Dayman; diameter of line, 2 inches; weight 96 pounds; specific gravity, 1.3.—[Sketch 38.]—[Errata, p. 235; 1858, p. xxi.]
1858	39	248–250	Analysis, microscopical, of specimens of bottom taken in sounding.—L. F. Pourtales. Green and ochraceous incrustation of *Foraminifera*, and jet tint of specimens.
1859	34	359–364	Deep-sea sounding apparatus.—Description of a form devised by W. P. Trowbridge, and explanation of its method and use. [Sketch 39.]—[Errata, 359, 1860, p. xx.]
1861	11	135–139	Sounding apparatus and log.—W. P. Trowbridge. Results obtained with an instrument devised by him.
1866	5	35–44	Florida Straits.—H. Mitchell. Report on soundings; northern approach; southern approach; difficulties in the way of laying a telegraph cable; remarks upon lines and leads; table of soundings across the Straits of Florida from Sand Key to El Moro, 1866.—[Sketch 17.]
1866	5	139	Berryman apparatus; rates of outrun of line. (*See* 1857, specimen sounding. Sketch 71.)
1868	12	168–170	Report upon dredgings near the Florida Reef.—L. F. Pourtales. Organic specimens; corals, echinoderms, brachiopods, etc.
1874	14	152	Device for detaching from a line the heavy weight requisite in deep-sea soundings.—[Sketch No. 23.]—Lieut. Com. C. D. Sigsbee.
1874	16	154	Ocean salinometer.—J. E. Hilgard, Assistant.
1876	23	407–409	List of publications relating to the deep-sea investigations carried on in the vicinity of the coasts of the United States under the auspices of the Coast Survey.
1877	10	108–113	Optical densimeter, for ocean water.—J. E. Hilgard, Assistant.
1879	6	95–102	Dredging operations in the Caribbean Sea.—[With two maps.]—Alexander Agassiz.
1880	16	297–340	Bering Sea.—W. H. Dall. Report on the currents and temperatures, and also those of the adjacent waters; sources of information; surface temperature; tables of temperatures; pack ice; summer temperatures; the Kuro Siwo and its extensions; table of North Pacific Sea temperatures; comparison of sea temperatures from observations by the *Challenger*, 1873 and 1875; currents of Bering Sea; observations of the *Tuscarora* and *Venus*; those of Krusenstern, 1804–1806; notes by whalers and others; table of temperatures; of currents; observations off the coast of Asia; in the Arctic in general; in the vicinity of Point Barrow. Supplementary note.—Additional observations in the Arctic Sea; boundary line between the territory of the United States in Alaska and Russia in Asia; diagrams of surface and vertical isotherms; chart of currents.

PHYSICAL HYDROGRAPHY—Continued.

DEEP-SEA SOUNDINGS, TEMPERATURES, AND DENSITIES—Continued.

Year.	Appendix.	Pages.	Subject and author.
1880	.....	.....	Deep-sea sounding and dredging.—A description and discussion of the methods and appliances used on board the Coast and Geodetic Survey steamer *Blake*.—By Charles D. Sigsbee, Lieutenant-Commander, U. S. N., Assistant in the Coast and Geodetic Survey. 221, quarto. (With 54 illustrations.) Washington: Government Printing Office, 1880.
1882	18	451–457	Report on the Siemens electrical deep-sea thermometer.—By Commander J. R. Bartlett, U. S. N., Assistant. Test of thermometer on the U. S. Coast Survey steamer *Blake*, with tables of results obtained at different depths and under different conditions, and a description of the apparatus.—By Werner Suess. [Sketches 48 and 49 and diagrams with text.]
1882	19	459–461	Recent deep-sea soundings off the Atlantic coast of the United States.—By J. E. Pillsbury, Lieutenant, U. S. N., Assistant. A general summary of the operations of the U. S. Coast Survey steamer *Blake* in the examination of the western Atlantic basin during the years 1880, 1881, 1882, and 1883.—[Illustration No. 50.]
1884	13	435–438	Geology of the sea bottom in the approaches to New York Bay.—By A. Lindenkohl, U. S. Coast and Geodetic Survey Office. Prefatory remarks; characteristics of sea bottom; (1) a well-defined submarine valley; (2) an area of clay bottom extending about 100 miles seaward; (3) a deep ravine at the edge of the continental slope, the Hudson River fiord; geology of the sea bottom in the approaches to New York Bay illustrated.—[Illustration No. 24.]
1884	17	619–621	Description of a model of the depths of the sea in the Bay of North America and Gulf of Mexico.—By J. E. Hilgard, Superintendent. A detailed description of the model; oceanic depressions and terrestrial elevations contrasted; addendum giving effect of an assumed reduction in the depth of the sea of 100 fathoms.—[Illustration No. 25.]
1890	.....	175–177	Bulletin No. 18.—Table for the reduction of hydrometer observations of salt-water densities.—Prepared for publication by O. H. Tittmann, Assistant.
1891 Pt. 2	6	275–277	On the reduction of hydrometer observations of salt-water densities.—By O. H. Tittmann.
1891 Pt. 2	7	279–281	On an investigation of the relations of cold and warm ocean currents off the New England coast, by the U. S. Fish Commission, with the cooperation of the U. S. Coast and Geodetic Survey.—By William Libby, jr., U. S. Fish Commission.
1895 Pt. 2	6	355–369	Notes on the specific gravity of the waters of the Gulf of Mexico and the Gulf Stream.—By A. Lindenkohl.—[Two illustrations, Nos. 33 and 34, and eight diagrams, Nos. 1 to 8.]

SURVEYS AND EXPLORATIONS OF OYSTER BEDS.

1881	11	269–353	Report on the oyster beds of the James River, Virginia, and of Tangier and Pocomoke sounds, Maryland and Virginia.—By Francis Winslow, Master, U. S. N., Assistant, Coast and Geodetic Survey. Preface; instructions; methods of conducting the investigation; (1) delineation of the beds; specimen of record; t des; specimens; bottom and water specimens; substratum of bottom; currents; number of oysters to the square yard; temperature of the water; names and areas; report of the investigation conducted during the summer of 1878; oyster beds of the James River, Virginia; currents; section across James River; Mulberry Point beds; Point of Shoals and Jail Island Beds; Blunt Point bed; Thomas Point, Kettle Hole, and White Shoal beds; Brown's Shoal bed; Cruisers Rock and Nansemond Ridge; the fishery and its effects; Tangier and Pocomoke sounds; Fishing Bay beds; Were Point beds; Sharks Fin bed; diagram 1, profiles 1–4; Nanticoke Middle Ground bed; Clump Point Rocks; Horseys Bar and Tylers Rock; Drumming Shoal bed; Cedar Rock; the Cow and Calf beds; diagram 2, profiles 5–8; Turtle-Egg Island bed; Mud Rock; the Muscle Hole bed; diagram 3, profiles 9–12; Piney Island Bar; beds of the Manokin River; beds of the Big Annemessex River; diagram 4, profiles 13–15; Terrapin Sand beds; Pauls bed; bed of Janes Island light-house; the Great Rock; diagram 5, profiles 16–20; the Womans Marsh bed; Thoroughfare beds; California beds; diagram 6, profiles 21–24; Johnsons bed; Oak Hammock Rocks; densities; comparison of densities.—Tangier; currents; deposit; effect of gales and ice; Pocomoke Sound; scattered oysters in Pocomoke Sound; diagram 7, profiles 25–31; Buoy

PHYSICAL HYDROGRAPHY—Continued.

SURVEYS AND EXPLORATIONS OF OYSTER BEDS—Continued.

Year.	Appendix.	Pages.	Subject and author.
			Spit bed; Muddy Marsh bed; The Bird bed; Horn Island bed; beds of Guilford Channel; *Beach Island bed; Parkers bed; The Brig* bed; densities; comparison of densities—Pocomoke; currents; deposits; *effect of ice and gales; general information given by oyster*men; conclusion; Table I, giving number of oyster dredgers seen in Crisfield Harbor *in one day*; and number of bushels of oysters taken; Table II, number of young oysters taken; number of oysters taken in one day in the Upper Tangier, Middle Tangier, Lower Tangier, and in the Pocomoke; destruction of oyster beds; their preservation; investigation conducted during the summer and autumn of 1879; instructions; plan of work; illustration 39, cluster of oysters and sponge taken from unworked beds of the Chesapeake; delineation *of the beds; beds in the Nanticoke River; beds in the* Little Annemessex; beds in Hedges Strait; investigation of the *Chesapeake Bay west of Tangier and* Smiths Island; illustration 40, cluster of oysters and sponge from unworked beds of the Chesa*peake;* table showing number of oysters to the square yard; Table I, dredging results—Chesapeake Bay; illustration 41, adult oyster, natural size; Table II, dredging results—Chesapeake Bay; fecundity of the beds in the Sounds; Table I, dredging results—Tangier Sound; table showing the success of spatting at different seasons—Tangier Sound; Table showing the success of spatting in *different seasons*—Pocomoke Sound; Table II, dredging results—Tangier and Poco*moke sounds; illustration 42, specimen tile No.* 7; table showing number of oysters to the square yard in Tangier Sound and *in Pocomoke Sound; information* obtained from spat-collectors; illustration 43, specimen tile No. 2; investigation of temperatures; investigation of the changes in density of the water, illustration 44, specimen tile No. 6; incidental information; information obtained from "record of statistics;" table showing estimated number of oysters removed in 1879—*Upper Tangier, Middle Tangier,* Lower Tangier, and Pocomoke Sound; table showing number of *oysters removed; conclusions; table showing number of oysters* removed from Great Rock and Womans Marsh; Appendix A, area of *oyster beds—Tangier and Pocomoke sounds; illustration 63, Astyris;* variety winslovii; Appendix B, description by Assistant Dall of "drill" or *astyris* referred to in the report of the operations during the season of 1878; Appendix C, table showing number and class of dredging vessels seen from the *Palinurus* during the season of 1878; Appendix D, form of questions used in collecting information from oystermen; Appendix E, table giving analysis of water from Tangier and Pocomoke sounds and Chesapeake Bay, by *Prof. Moore, U. S. Naval* Academy; diagrams 9-15, curves showing difference of density of water *at bottom; chart of James River, showing approximate* limits of oyster beds; upper part of Tangier Sound, chart showing approx*imate position of oyster beds;* lower part of Tangier Sound, chart showing approximate position of oyster beds.—[Illustrations, 39-63.]
1889	.....	51-136	Bulletin No. 10.—Report on the Sounds and Estuaries of North Carolina with reference to Oyster Culture.—By Francis Winslow, Lieutenant U. S. Navy, Assistant, U. S. Coast and Geodetic Survey, commanding schooner *Scoresby*.—[2 illustrations.] Table of contents: *Introduction*; preface; *information desired*; methods used in the survey; area examined; general description; descriptions *of sections, with results of the work in detail*; limits of *projections*, with areas of public and private oyster grounds; specific gravities; general summary of results; general condition of the oyster industry prior to 1887; recommendations for new legislation; history of the Shell Fish Commission; operation of the new law; method of locating lots; conclusion; appendix; an act to promote the cultivation of shellfish in the State, and form of application for private oyster grounds.
1890	.....	179-209	Bulletin No. 19.—*On the Sounds and Estuaries of Georgia* with reference to Oyster Culture.—A report by J. C. Drake, Ensign, U. S. Navy, Assistant, U. S. Coast and Geodetic Survey, commanding schooner *Ready*, 1889-90.—[7 illustrations.] Preface; methods; limits of the area examined; description of the areas examined; general conclusions; densities; table of areas examined with reference to oyster culture; resolution authorizing the appointment of an oyster commission; State of Georgia; *an act for the regulation* and protection of oyster culture; form of application for oyster grounds; charts to accompany *report on oyster survey* of the following sounds, harbors, or rivers of Georgia: Tybee Roads and Wassaw *Sound, Ossabaw Sound, Vernon and* Ogeechee rivers, St. Catherines Sound, Sapelo Sound, Doboy and Altamaha sounds, St. Simon Sound, Brunswick Harbor and Turtle River, and St. Andrews Sound.

TERRESTRIAL MAGNETISM.

Year.	Appendix.	Pages.	Subject and author.
1845	3	41–43	Extract from a letter addressed by Ferd. H. Gerdes, Assistant, U. S. Coast Survey, to Prof. A. D. Bache, Superintendent, containing remarks upon the change in the magnetic variation within short distances in the Gulf of Mexico.
1854	30	37–40	(Report for 1854.)—Page 39, App. No. 30.—Reference to magnetic observations made at stations in California.—W. P. Trowbridge.
1854	43	142–145	(1844–5.)—Table of magnetic declination. Results of Coast Survey magnetic observations at 136 stations along the coast of the United States.—[Errata, 144, 145; 1855, p. xix.]
1854	44	146	Meridian lines.—Report of Assistant G. W. Dean on the establishment of meridian lines at Petersburg, Va., and Raleigh and Wilmington, N. C.
1855	47	295–306	(1844–5.)—Table of magnetic declinations in geographical order, from Coast Survey observations; with notes by A. D. Bache and J. E. Hilgard. Discussion of magnetic declination: (1) Northern part of the Gulf of Mexico; (2) Atlantic coast; (3) Pacific coast.—[Sketch 56.]
1855	48	306–337	(1717–1855.)—Secular variation in the magnetic declination.—C. A. Schott. Discussion of the secular change in the magnetic declination on the Atlantic and part of the Gulf coasts of the United States; Providence, R. I.; Hatboro, Pa.; Philadelphia, Pa.; Boston, Mass.; Cambridge, Mass.; New Haven, Conn.; New York, N. Y.; Charleston, S. C.; Mobile, Ala.; Havana, Cuba; Burlington, Vt.; Chesterfield, N. H.; Salem, Mass.; Nantucket, Mass.; Albany, N. Y.; Washington, D. C.; Pensacola, Fla.—[Sketch 51.]—[Errata, pp. 314, 335; 1855, p. xviii.]
1855	49	337	(1855.)—Magnetic observations.—C. A. Schott. Results for declination, dip, and horizontal intensity, at sixteen eastern stations, July to September, 1855.
1856	28	209–225	1839–1855.)—Terrestrial magnetism.—Discussion relative to its distribution in the United States.—A. D. Bache and J. E. Hilgard. Methods and sources used; corrections for secular variations; construction of maps (Sketches 61 and 62); comparison of maps for declination, dip, and intensity; supplementary note (Mexican observations); Table I, Atlantic, Gulf, and Pacific sections; II, near parallel 35°, by J. C. Ives, Whipple's expedition; III, from various new sources—lakes, territories, Panama; IV, residual difference between the Coast Survey observations, reduced to 1850, and the values obtained from the accompanying map—[Sketches 61 and 62.]
1856	29	226	Magnetic observations.—C. A. Schott. Methods used in observations of the present year; magnet H.
1856	30	227	(1856.)—Magnetic elements.—C. A. Schott. Results of observations for declination, dip, and intensity at stations in Delaware, Maryland, and Virginia.
1856	31	228–235	(1792–1855.)—Secular change of declination; Western coast.—C. A. Schott. List of magnetic declinations observed on the western coast from the earliest to the present ones, arranged in order of geographical latitudes.—Annual change; (1) San Diego; (2) Monterey; (3) San Francisco; (3) Cape Mendocino; (5) Cape Disappointment.—Recapitulation of results for secular change.
1856	32	235–245	(1780–1855.)—Secular change of inclination; Atlantic coast.—C. A. Schott. Toronto, Canada; Albany and Greenbush, N. Y.; Cambridge, Mass.; Providence, R. I.; West Point and Cold Spring, N. Y.; New Haven, Conn.; New York, N. Y.; Philadelphia, Pa.; Washington, D. C.; Baltimore, Md.; recapitulation of results.—Table I, geographical positions and number of dip observations; II, formula for each station; III, probable error, epoch of minimum dip, and annual variation in current year.—[Sketch 63.]
1856	33	246–249	(1790–1855.)—Secular change of inclination; western coast.—Approximate determination of the secular change of inclination.—C. A. Schott. Table of observation made up to the present time; deductions therefrom—(1) San Diego; (2) San Pedro; (5) Monterey; (6) San Francisco; (8) Fort Vancouver; (10) Cape Disappointment.
1857	32	334–342	Magnetism.—Reports upon the gradual loss of magnetism of the several magnets in use in the Survey of the Coast.—C. A. Schott. Account of magnets: S 8, C 32, C 9, D, C 6, H, and Smithsonian magnet used in 1855.—Table: Recapitulation of values for magnets severally, and discussion.—[Sketch 68.]
1858	24	191, 192	(1856–1858.)—Magnetic elements.—Continuation.

TERRESTRIAL MAGNETISM—Continued.

Year.	Appendix.	Pages.	Subject and author.
1858	25	192-195	(1680-1850.)—Secular variation of magnetic declination at Hatboro, Pa.—C. A. Schott.
			Discussion and development of an intermediate period.—Table of declinations from 1680 to 1850.—Diagram.—[Errata, p. 193: 1858, p. xxi.]
1858	26	195-197	(1809-1857.)—Secular variation at Washington, D. C.—C. A. Schott.
			Declination from 1809 to 1857.—Dip from 1839 to 1858.
1859	16	172-175	(1858.)—Variation of the compass.—General table for the use of navigators.—[Sketch 38.]
1859	22	278-295	Discussion of the magnetic and meteorological observations made at the Girard College Observatory, Philadelphia, in 1841, 1842, 1843, 1844, and 1845.—A. D. Bache.—[Sketch 37.]—[Errata, pp. 279, 280, 293: 1860, p. xx.]
			Part I. Investigation of the eleven-year period in the amplitude of the solar-diurnal variation and of the disturbances of the magnetic declination.
		278	Introduction.
		279	Separation of disturbances and establishment of normal readings of the declinometer.
		285	Analytical expressions of the regular solar-diurnal variation of the declination.
		286	Inequality of the amplitude due to the eleven (or ten) year period.
		287	Discussion of the number of disturbances of the declination; their annual inequality.
		290	Diurnal inequality of the number of disturbances of the declination.
		290	Deflections by disturbances; their mean annual amount; effect of the eleven (or ten) year period.
		292	Deflections by disturbances; their mean diurnal amount.
		295	Connection of the frequency of the solar spots with the changes in the amplitude of the diurnal variation of the declination.
1859	23	296	(1859.)—Declination, dip, and intensity.—C. A. Schott.
			Results of observations made by him in Canada, Maine, New Hampshire, Vermont, Massachusetts, and Connecticut.—Footnote on disturbances.
1859	24	296-305	(1680-1860.)—Secular change in declination.—C. A. Schott.
			Variation of the needle on the coasts of the United States for every tenth year since 1680; formulas expressing secular change, used for calculating the tabular values for Group I, stations between Portland, Me., and Williamsburg, Va., with table of observations made between 1680 and 1860; for Group II, southern stations and western coast.—Record of all observed declinations made use of in the above paper not heretofore published in the Coast Survey Reports.
1860	21	268-271	(1860.)—Eclipse expedition to Aulezavik Island, Labrador. Report on the determination of the magnetic elements by Edward Goodfellow, Assistant, with notes by C. A. Schott, Assistant.
1860	23	293-312	Discussion of the magnetic and meteorological observations made at the Girard College Observatory, Philadelphia, in 1841, 1842, 1843, 1844, and 1845.—A. D. Bache.
			Part II. Investigation of the solar-diurnal variation in the magnetic variation, and its annual inequality.
		293	Investigation of the solar-diurnal variation of the declination.
		302	Its semiannual inequality.
		303	Analytical and graphical exhibition of the solar-diurnal variation for each month, summer, winter, and year.
		307	Maxima and minima, and times of average value of the declination; diurnal range.
		309	Annual variation of the declination.
1860	24	312-324	Discussion of the magnetic and meteorological observations made at the Girard College* Observatory, Philadelphia, in 1840, 1841, 1842, 1843, 1844, and 1845.—A. D. Bache.
			Part III. Investigation of the influence of the moon on the magnetic declination.
		312	Lunar influence on the magnetic declination; tabulation of results according to the moon's hour angle.
		318	Comparison of lunar-diurnal variation for three epochs.
		319	Resulting lunar-diurnal variation.
		321	Inequality in the lunar-diurnal variation.
		324	Investigation of deflections depending upon lunar phases; variation in declination and in parallax.
1860	25	324-326	Solar spots.—Report of Assistant C. A. Schott on the results of observations made during the first seven months of the year 1860.

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Year.	Appendix.	Pages.	Subject and author.
1860	26	326-349	Key West magnetic station.—Description of instruments and plan of magnetic observatory; with results.—W. P. Trowbridge.
			Declinometer, recording cylinder, and clock; vertical-force magnetometer; adjustments; mean daily range of temperature for each month, 1851, 1852, and monthly range for four years; mean monthly temperature for fourteen years; lamps; scale measurements; temperature coefficients of the horizontal and vertical forces of magnets; photographic arrangements; magnet H—axis and intensity; dip; scale values for intensity magnets—tables and computation; experiments for temperature coefficients of horizontal-force magnet, with hot water and ice.—[Sketches 23 and 24.]
1860	27	350, 351	Eastport station, Maine.—General description of magnetic station.—L. F. Pourtales.
1860	28	351, 352	Declination, dip, and intensity at various stations (supplementary to 1856, p. 227, and 1858, p. 191).
1860	29	352	Declination, dip, and intensity, determined in 1860 on the coasts of Massachusetts, Long Island, and New Jersey.—C. A. Schott.
1861	22	242-251	Secular change of intensity.—C. A. Schott.
			Discussion of observations made on the Atlantic, Gulf, and Pacific coasts of the United States; intensity statistics; notes; table of annual change for Atlantic and Pacific groups.
1861	23	251-256	New discussion of the distribution of the magnetic declination on the coast of the Gulf of Mexico, with a chart of the isogonic curves for 1860.—C. A. Schott.
1861	24	256-259	New discussion of the distribution of the magnetic declination on the coasts of Virginia, South Carolina, and Georgia, with a chart of the isogonic curves for 1860.—C. A. Schott.
1861	25	259-261	Solar spots.—Abstract of observations made at the Coast Survey Office.—C. A. Schott.
1862	15	161-185	Discussion of the magnetic and meteorological observations made at the Girard College Observatory, Philadelphia, in 1840, 1841, 1842, 1843, 1844, and 1845.—A. D. Bache.—[Sketch 48.]—[Errata, pp. 178, 182; 1862, p. IV.]
			Part IV. Investigation of the eleven (or ten) year period and of the disturbances of the horizontal component of the magnetic force.
		161	Instrumental notice.
		162	Correction of readings for changes of temperature; scale values.
		169	Correction for progressive instrumental change; hourly normals for each month.
		173	Horizontal intensity; absolute value; effect of the loss of magnetism of the bar; secular change.
		174	Separation of the larger disturbances.
		175	Corrected normals.
		178	Investigation of the eleven (or ten) year period, from changes in the amplitude of the solar-diurnal variation.
		180	Eleven (or ten) year inequality, as indicated by the disturbances.
		182	Analysis of the disturbances; annual and diurnal variation.
		185	Classification of disturbances according to their magnitude.
1862	16	186-200	Discussion of the magnetic and meteorological observations made at the Girard College Observatory, Philadelphia, in 1840, 1841, 1842, 1843, 1844, and 1845.—A. D. Bache.—[Sketch 48.]
			Part V. Investigation of the solar-diurnal variation and of the annual inequality of the horizontal component of the magnetic force.
		186	Preparation of hourly normals for each month.
		193	Regular solar-diurnal variation.
		194	Semiannual inequality in the diurnal variation.
		195	Analysis of the solar-diurnal variation.
		198	Epochs of maxima and minima; amplitude; epochs of average value.
		200	Annual variation of the force.
1862	17	202-212	Discussion of the magnetic and meteorological observations made at the Girard College Observatory, Philadelphia, in 1840, 1841, 1842, 1843, 1844, and 1845.—A. D. Bache.
			Part VI.—Investigation of the influence of the moon on the magnetic horizontal force.
		202	Number of observations for lunar discussion and their distribution according to western and eastern hour angles of the moon; differences from monthly normals, arranged for moon's hour angles.
		206	Lunar-diurnal variation for two periods.
		207	Lunar-diurnal variation in summer and winter.
		209	Analysis of the lunar-diurnal variation.
		210	Investigation of the horizontal force in reference to lunar phases.
		211	Influence of the moon's changes of declination.
		212	Influence of the moon's changes of distance.

TERRESTRIAL MAGNETISM—Continued.

Year.	Appendix.	Pages.	Subject and author.
1862	18	212	Results for declination, dip, and horizontal intensity in Pennsylvania, in the District of Columbia, and in New York.—C. A. Schott.
1862	19	212–229	Abstract of results of a magnetic survey of Pennsylvania and parts of adjacent States in 1840 and 1841, with some additional results of 1843 and 1862.—A. D. Bache.
			Declinations observed by him in 1840 and 1841; tabular comparison of secular changes in 1840, 1841, and 1862; chronometric results for longitude; geographical positions; distribution of declination for 1842.0; general table of results referred to common epoch, 1842.0; comparison of observed and computed values; dip, distribution of, and isoclinal lines for 1842, Groups 1 to 4; correction to epoch; comparison of observed and computed dip; horizontal intensity and isodynamic lines for 1842; tabular formation of groups for the analytical expression of the distribution of horizontal force referred to 1842.0; comparison of observed and hypothetical computed values; representation of the total force.—[Sketch 47.]
1862	20	230, 231	Declination, dip, and intensity at various stations (supplementary to lists given in Annual Reports of 1856, 1858, and 1860, pp. 351, 352).
1862	21	231, 232	Solar spots.—Abstract of observations made at the Coast Survey Office.—C. A. Schott.
			Supplementary to those published in Report for 1861.
1862	22	232–235	Bessel's periodic functions developed for periods frequently occurring in magnetic and meteorological investigations, with examples.—C. A. Schott.
1862	23	236–238	Dipping needle.—Description of a new form of axis changeable in position.—J. E. Hilgard.
1863	19	156–183	Discussion of the magnetic and meteorological observations made at the Girard College Observatory, Philadelphia, in 1840, 1841, 1842, 1843, 1844, and 1845.—A. D. Bache.—[Sketch 30.]
			Part VII. Investigation of the eleven-year period and of the disturbances of the vertical component of the magnetic force, with a supplement on the effect of auroral lights.
		156	Instrumental notice.
		157	Determination of the effect of changes of temperature; scale values; reduction of observations to a uniform temperature.
		164	Recognition and separation of the larger disturbances.
		168	Investigation of the eleven (or ten) year period, in the amplitude of the diurnal variation.
		171	Investigation of the eleven (or ten) year period, in the disturbances, and their general analysis.
		172	Annual inequality in the number and amount of disturbances.
		174	Diurnal inequality of the disturbances.
		177	Classification of the disturbances according to their magnitude.
		178–183	Appendix; effect of the aurora borealis on the declination, the horizontal and vertical force.
1863	20	183–195	Discussion of the magnetic and meteorological observations made at the Girard College Observatory, Philadelphia, in 1840, 1841, 1842, 1843, 1844, and 1845.—A. D. Bache.—[Sketch 30.]
			Part VIII. Investigation of the solar diurnal variation and of the annual irregularity of the vertical component of the magnetic force.
		183	Preparation of hourly normals for each month and year.
		189	Regular solar diurnal variation.
		190	Semiannual inequality of the diurnal variation.
		190	Analysis of the diurnal variation.
		193	Maxima and minima; ranges; epochs of average force.
		195	Annual inequality of the vertical force.
1863	21	196–204	Discussion of the magnetic and meteorological observations made at the Girard College Observatory, Philadelphia, in 1840, 1841, 1842, 1843, 1844, and 1845.—A. D. Bache.
			Part IX. Investigation of the influence of the moon on the magnetic vertical force.
		196	Number of observations for lunar discussion; distribution according to eastern and western hour-angles; differences from monthly normals, arranged for moon's hour-angles.
		201	Lunar diurnal variation in summer and winter.
		202	Analysis of the lunar diurnal variation of the vertical force.
		204	Lunar effect upon inclination and total force.
1863	22	204	Results for the magnetic declination, dip, and intensity, from observations, by C. A. Schott and G. W. Dean, in Maine, Connecticut, and the District of Columbia.

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Year.	Appendix.	Pages.	Subject and author.
1863	23	205	Eduction-time in relay magnets.—Report on preliminary experiments made by Assistant G. W. Dean to determine their relative power. [See under "Longitude" reference to Ann. Report for 1864, App. No. 20.]
1864	16	183-190	Discussion of the magnetic and meteorological observations made at the Girard College Observatory, Philadelphia, in 1840, 1841, 1842, 1843, 1844, and 1845.—A. D. Bache.
			Part X. Analysis of the disturbances of the dip and total force.
		183	Formation of table of disturbances of the two component parts and their combination for dip and total force.
		184	Analysis of disturbances of the inclination.
		185	The annual inequalities in amount and number; eleven (or ten) year inequality.
		186	Diurnal inequalities, in amount and number.
		187	Classification of disturbances in dip, according to their magnitude.
		187	Analysis of disturbances of total force.
		188	Their annual inequalities, in amount and number; eleven (or ten) year inequality.
		189	Diurnal inequalities, in amount and number.
		190	Classification of disturbances in total force.
1864	17	191-199	Discussion of the magnetic and meteorological observations made at the Girard College Observatory, Philadelphia, in 1840, 1841, 1842, 1843, 1844, and 1845.—A. D. Bache.—[Sketch 38.]
			Part XI. Solar diurnal variation and annual inequality of the inclination and total force.
		193	Combination of the diurnal normals of the two components for dip and total force.
		193	Solar diurnal variation of the inclination.
		194	Its semiannual inequality.
		194	Analysis of the solar diurnal variation of the dip.
		195	Maxima and minima; ranges and epochs of average value.
		196	Solar diurnal variation of the total force.
		196	Its semiannual inequality.
		197	Analysis of the solar diurnal variation of the total force.
		198	Annual inequality of the dip and total force.
1864	18	199-206	Discussion of the magnetic and meteorological observations made at the Girard College Observatory, Philadelphia, in 1840, 1841, 1842, 1843, 1844, and 1845.—A. D. Bache.
			Part XII. Discussion of the magnetic inclination and table of absolute values of the declination, inclination, and intensity between 1841 and 1845.
		199	Discussion of the magnetic inclination; introductory notice.
		200	Abstract of observation of dip; monthly means.
		203	Collection of dip observations at Philadelphia.
		203-204	Analytical expression of secular change of dip normal; absolute values of the magnetic declination, dip, horizontal, vertical, and total force for five epochs, and the mean epoch, January, 1843.
1864	18	205, 206	Girard College observations.—Index to discussion by A. D. Bache.
1864	19	207-210	Results of magnetic observations made in the United States by Prof. J. N. Nicollet between 1832 and 1836.
1864	20	211-220	Eduction time of relay magnets, deduced from experiments.—G. W. Dean.
1865	18	166-174	Results of magnetic observations made at Eastport, Me., between 1860 and 1864.
			Declination, diurnal range of; annual inequality (diagram); epochs of greatest diurnal deflection; mean monthly values of declination between August, 1860, and July, 1864; annual effect of the secular change; annual inequality of the declination; same at Toronto; comparative curve.—[Sketch 29 (theodolite magnetometer).]
1865	19	174-176	Report on the distribution of the magnetic declination on the coast and parts of the interior of the United States.—C. A. Schott.
			Isogonic chart for 1870.—[Sketches 27 and 28.]
1869	9	199-207	Report on the results from the observations made at the magnetic observatory on Capitol Hill, Washington, D. C., between 1867 and 1869.—C. A. Schott.
			Magnetic instruments; scheme of observing; instrumental constants; results; declination on Capitol Hill; turning epochs; dip; horizontal force; tabular synopsis of magnetic elements observed in the District of Columbia.
1870	14	107-110	New investigation of the secular changes in the declination, dip, and intensity of the magnetic force at Washington, D. C.—C. A. Schott.
1870	15	111-114	Results of observations for daily variation of the magnetic declination, made at Fort Steilacoom, Washington Territory, in 1866, and at Camp Date Creek, Arizona, in 1867, by David Walker, acting assistant surgeon, U. S. A., and discussed and reported by Assistant C. A. Schott.

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Year.	Appendix.	Pages.	Subject and author.
1872	14	235-254	Magnetic observations by means of portable instruments.—C. A. Schott. (1) *Determination of the magnetic declination; adjustment of the declinometer*; example of scale reading; magnetic declination; example; (2) *absolute and relative measures of the magnetic force*; the magnetometer; observations of deflections; horizontal intensity; deflections; form 1; magnetometer with attached theodolite; deflecting magnet in the magnetic prime vertical; form 2; theodolite magnetometer; deflecting and deflected magnets at right angles to each other; observations of oscillations; example; calculation; example of observation of deflections; (3) determination of the magnetic declination; reversal of poles of *dipping needles; magnetic dip*; specimen of record for finding magnetic meridian; magnetic dip; computation; *concluding remarks*. Appendix.—Ordinary adjustments of the theodolite.
1874	8	72-108	Secular change of magnetic declination in the United States and other parts of North America; new discussion.—C. A. Schott. Collection of magnetic declinations, Halifax, Nova Scotia; Quebec, Canada; York Factory, Hudson Bay; Portland, Me.; Burlington, Rutland, Vt.; Portsmouth, N. H.; Newburyport, Salem, Boston, Cambridge, Nantucket, Mass.; Providence, R. I.; Hartford, New Haven, Conn.; Albany, Oxford, Buffalo, N. Y.; Erie, Pa.; Cleveland, Ohio; Detroit, Mich.; New York and vicinity, N. Y.; Hatboroough, Philadelphia, Pa.; Washington, D. C.; Cape Henry, Va.; Charleston, S. C.; Savannah, Ga.; Key West, Fla.; Havana, Cuba; Kingston, Jamaica; New Orleans, La.; Vera Cruz, City of Mexico, Acapulco, San Blas, Mexico; Panama, New Granada; San Diego, Monterey, Point Pinos, San Francisco, Cal.; Cape Disappointment, W. T.; Sitka, Captains Harbor, Unalashka Island, Alaska; Eastport, Me.; Hanover, Chesterfield, N. H.; Toronto, Canada; Baltimore, Md.; Williamsburg, Va.; New Berne, N. C.; Mobile, Florence, Ala.; St. Louis, Mo.; Cape Mendocino, Cal.; Nootka, Vancouver Island; Petropaulovski, Kamtchatka; *table of empirical expressions for magnetic declination*; comparison of magnetic declination observed and computed; table, number of observations at each place; table of decennial values of the magnetic declination.
1874	9	109-130	Magnetic observations, Key West, Fla.—C. A. Schott. Monthly results for magnetic declination, 1860-1866; annual effect of the secular change of declination; *annual variation of the declination*; observed annual variation of the declination at stations near the Atlantic seaboard; *monthly values for magnetic dip* at Key West; annual effect of the secular change in the dip; monthly values for *horizontal intensity* at Key West; annular effect of the secular change in the horizontal intensity; annual variation in the horizontal intensity; general table of results from absolute measures of the magnetic declination, dip, and intensity; differential measures of changes in magnetic declination from the Brooke magnetographs at Key West, 1860-1866; monthly means of hourly readings from the photographic traces of the fixed declination at Key West; recapitulation of monthly means of *declinometer readings*; permanency in the line of detorsion in the suspension skein; discussion of the disturbances of the *magnetic declination*; monthly normals of hourly readings of the declinometer at Key West; mean monthly normals of hourly readings from observations extending over six years; number of disturbances during six successive years; distribution of disturbances in the yearly period; in the daily period; average magnitude of disturbances during successive years; in the yearly period; in the daily period; solar diurnal variation in the magnetic declination at Key West for the epoch 1863.3; the same between 1860 and 1866; the same at Philadelphia for the epoch 1842.5; diagram; characteristic features of the *daily variation*; *eleven-year inequality in the* solar diurnal variation; mean annual normals of hourly readings of *the declinometer for six years*, 1860-1866, at Key West; mean annual normal deflections at each hour.
1875	16	254-278	Terrestrial magnetism.—C. A. Schott. Instructions for magnetical observations.—Reprinted from Appendix No. 14, Report of 1872.) (1) Determination of the magnetic declination; sketch; adjustment of the declinometer; example of scale *reading*; *magnetic declination*; ordinary adjustments of the theodolite; diagram; example of record and *reduction*; *solar diurnal variation of* declination at Toronto, Canada, Philadelphia, and Key West; (2) determination of the magnetic inclination; *reversal of the poles of dipping needles*; diagram No. 29, of dip circle; 29 B, dip circle; magnetic dip; specimen of record for finding magnetic meridian; (3) absolute and relative measures of the magnetic force; the magnetometer; observations of deflections; forms 1, 2; observations of oscillations; forms; example to observations of deflections for value of *q of magnet H*.
1876	21	400	Chart of magnetic *declination in the United States*, 1875.—J. E. Hilgard.
1877	7	96-97	*Magnetic observatory* at Madison, Wis.—C. A. Schott.

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Year.	Appendix.	Pages.	Subject and author.
1879	.....	50	Secular change of the magnetic declination in the United States and at some foreign stations.—(Third edition; two illustrations. Separately printed.)
1879	9	124-174	Secular change of magnetic declination in the United States and at some foreign stations.—(Fourth edition, June, 1881.)—C. A. Schott.—(A third edition was published separately June, 1879.) Magnetic declination, definition; solar diurnal variation; annual variation; lunar inequalities; magnetic disturbances; historical note; the needle used among the Chinese and Norwegians; the declination; isogonic charts; secular variation of the declination; analytical expression of the secular change of the declination; collection of magnetic declination for the discussion of the secular change; Paris, France; Halifax, Nova Scotia; Quebec, Montreal, Canada; York Factory, Hudson Bay; Portland, Me.; Burlington, Rutland, Vt.; Portsmouth, N. H.; Newburyport, Salem, Boston, Cambridge, Nantucket, Mass.; Providence, R. I.; Hartford, New Haven, Conn.; Albany, Oxford, Buffalo, N. Y.; Toronto, Canada; Erie, Pa.; Cleveland, Ohio; Detroit, Mich.; St. Louis, Mo.; New York and vicinity, N. Y.; Philadelphia, Harrisburg, Pa.; Baltimore, Md.; Washington, D. C.; Cape Henry, Va.; Savannah, Ga.; Key West, Fla.; Havana, Cuba; Kingston, Jamaica; Panama, New Granada; Rio Janeiro, Brazil; Mobile, Ala.; New Orleans, La.; Vera Cruz, City of Mexico, Acapulco, San Blas, Mexico; Magdalena Bay, Lower California; San Diego, Monterey, Point Pinos, San Francisco, Cal.; Cape Disappointment, W. T.; Kailua, Hilo, and Kaelakekua bays, Owhyhee, Sandwich Islands; Honolulu, Oahu, Sandwich Islands; Sitka, Alaska; Captains Harbor, Unalashka; Petropaulovski, Kamtchatka; St. Johns, Newfoundland; Eastport, Me.; Hanover, Chesterfield, N. H.; Sault Ste. Marie, Grand Haven, Mich.; Williamsburg, Va.; New Bern, N. C.; Florence, Ala.; Bermuda Islands; San Antonio, Tex.; Omaha, Nebr.; Council Bluffs, Iowa; Salt Lake City, Utah; Cape Mendocina, Cal.; Port Townsend, W. T.; *Nee-ah Bay*, W. T.; *Nootka, Vancouver Island*.—Table I, formula for magnetic declination at various places; Table II, comparison of observed and computed magnetic declinations; Sketch No. 38; Table III, number of observations; apparent probable error of observation; Sketch No. 37; Sketch No. 39; Table IV, decennial values of the magnetic declination computed from preceding equations.
1880	19	412-417	Variation of the compass off the Bahama Islands at the time of the landfall of Columbus in 1492.—C. A. Schott. Remarks on the early use of the compass; at the time of Columbus; reckoning time; notes on the voyages of Columbus; line of no variation; corrections to the agonic line; track of Columbus across the Atlantic in 1492 in tabular form; conclusions.—[Sketch No. 84.]
1881	8	126-158	Directions for magnetic observations with portable instruments.—(Third and enlarged edition, with 4 plates.)—By Charles A. Schott, Assistant. Introductory remarks; selection of stations; I, determination of the magnetic declination; definition; finding the true meridian; adjustment of the theodolite and alt-azimuth instrument; formulæ for determining azimuth and time; examples of record, and reductions from sun observations and from observations on Polaris; adjustment of the declinometer and magnetometer; observations for magnetic axis and scale values, with examples; table of solar diurnal variation of the declination at Toronto, Canada, at Philadelphia, Pa., and at Key West, Fla.; tables of the times and azimuths of Polaris at elongation, for the use of surveyors in determining the true meridian; observations for magnetic declination; II, determination of the magnetic inclination; description of instrument; adjustment of dip circle; reversal of poles of dipping needles; observations for inclination or dip, with example; observations of dip by means of a loaded needle (the Mayer method), with example of record and deduction; determination of the relative total intensity by means of the dip circle in connection with deflecting weights, as devised by Rev. H. Lloyd, with formulæ and example; determination of relative total intensity by means of the dip circle, combining deflections by gravity and magnetism, by Dr. Lloyd's method, with formulæ and example; III, absolute and relative measures of the magnetic force; units of measure of the magnetic force; description and use of the magnetometer; observations of deflections, *with examples of record* and deductions; determination of magnetic constants; observations of oscillations, with example of record and reduction; corrections for inequality of temperature; example of observations of deflection for value of q (temperature coefficient); introduction of absolute for relative values of the horizontal force, as determined by oscillations alone; concluding remarks; formula for total force; constants for the conversion of intensity into different units; list of standard works on magnetism; illustrations of the different forms of magnetometers, and of the Kew dip circle.—[*Illustrations* 34-37.]

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Year.	Appendix.	Pages.	Subject and author.
1881	9	159–224	Terrestrial magnetism.—Collection of results for declination, dip, and intensity, from observations made by the U. S. Coast and Geodetic Survey between 1833 and 1882, July.—By Charles A. Schott, Assistant. Introductory remarks; explanation of the tables of magnetic results; tables of magnetic results arranged by States and Territories in alphabetical order, with a table headed "*Foreign countries*," ending with a description of stations, arranged in same order.
1882	12	211–276	On the secular variation of the magnetic declination in the United States and at some foreign stations.—(Fifth edition, November, 1882.)—By Charles A. Schott, Assistant. Introductory remarks; solar-diurnal variation; annual variation; lunar inequalities; secular variation; magnetic disturbances; historical note; the declination; isogonic charts; the secular variation of the declination; analytical expression of the secular variation of the magnetic declination; collection of magnetic declinations, observed at various places in the United States and at some foreign stations, from the earliest to the present time, and found suitable for the investigation of the secular variation; Table I, formulæ expressing the magnetic declination at various places and for any time within the limits of observation, deduced from the preceding collection of results. Table I (*b*), expressions for the magnetic declination at subordinate stations; Table II, comparison of observed and computed magnetic declinations; Table III, annual change of the declination and other data; Sketches 33, 36, graphically representing the secular variation at Baltimore, Md., San Francisco, Cal., and at Paris, France; Sketch 34, showing the position of the agonic line for 1790 and 1885, and annual change of the magnetic declination for the epoch 1885; chart of the secular change in the position of the agonic line of the North Atlantic between 1500 and 1900; Table IV, decennial values of the magnetic declination.—[Illustrations 33–36.]
1882	13	277–328	Distribution of the magnetic declination in the United States at the epoch, January, 1885, with three isogonic charts and one plate.—By Charles A. Schott, Assistant. Prefatory remarks; method of forming tables of observed magnetic declinations and corresponding values referred to epoch, January, 1885; a chart showing disturbed isogonics; table of results for Alaska, formed with a view of expressing the declination to 1885 in a function of the latitude ϕ and the longitude λ; discussion by Lloyd's formula; table of magnetic declinations, for the most part observed in the present century, reduced to the epoch, January 1, 1885, which forms the basis for the construction of three isogonic charts of the United States, Nos. 38, 39, and 40.
1882	14	329–426	Records and results of magnetic observations made at the charge of the "Bache fund" of the National Academy of Sciences, from 1871 to 1876.—Executed under the direction of J. E. Hilgard, M. N. A. S.; data collated and abstracts prepared by H. W. Blair, Assistant. Prefatory remarks; magnetic survey, 1871–'72; descriptions of stations; declinations for 1871–'72; table of declinations, with an explanation of table; horizontal intensity for 1871–'72; method of observing; tables of results for horizontal intensity, arranged by stations; table of general results for 1871–'72; declination, dip, horizontal intensity; descriptions of stations for 1873; table of results for declination for 1873; observations for local time; observations for dip; observations for horizontal intensity; general results for 1873; descriptions of stations for 1874; observations for declination for 1874; observations for local time; observations for dip; observations for intensity; general results for 1874; descriptions of stations for 1875; observations for declination; observations for local time; observations for declination, continued; observations for local time, continued; 1876, observations for declination; observations for dip; observations for horizontal intensity; general results for 1876; summary of results, 1871 to 1876.
1883	13	323–365	Account and results of magnetic observations made under the direction of the U. S. Coast and Geodetic Survey, in cooperation with the U. S. Signal Office, at the U. S. Polar Station, Ooglaamie, Point Barrow, Alaska.—Lieut. P. Henry Ray, A. S. O., commanding post; reduction and discussion by Charles A. Schott, Assistant. Table of contents; Part I, introduction; instructions and notes for the guidance of the observers to be stationed at Point Barrow, Alaska, and at Lady Franklin Bay, north of Smith Sound, Arctic Ocean, with a plan for magnetic house for Point Barrow; memorandum furnished Point Barrow relief party, with plan for new observatory; notes on the mounting; the adjustment and the determination of instrumental constants of the Brooke differential magnetometers; (1) the declination or unifilar magnetometer, (2) the horizontal force or bifilar magnetometer, (3) the vertical force or balance magnetometer; geographical position of Ooglaamie Station, Alaska; sketch of U. S. Polar Station, Ooglaamie, Alaska; Part II, absolute measures; monthly values

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Year.	Appendix.	Pages.	Subject and author.
			of the magnetic declination, dip, and intensity at Ooglaamie, December, 1881, to August, 1883; Part III, differential measures; hourly variations of the declination, horizontal, and vertical intensities, with bimonthly term-day readings, at Ooglaamie, December, 1881, to August, 1883; adjustments of the Brooke differential magnetometers; recapitulation of monthly mean values (inclusive of disturbances) of hourly readings of Brooke declinometer at Ooglaamie, Alaska, 1882-83; solar-diurnal variation of the declination, inclusive of disturbances, with a graphical representation; separation of the larger magnetic variations or so-called disturbances and their discussion; the bifilar magnetometer.—[Illustration 34.]
1885	6	129-274	The geographical distribution and secular variation of the magnetic dip and intensity in the United States.—By Charles A. Schott, Assistant. Prefatory letter; introduction; Part I, explanation of the general table; Table I, observed magnetic dips and horizontal and total magnetic intensities in the United States and adjacent regions, arranged alphabetically; Part II, secular variation of the magnetic dip in the United States; introductory remarks; discussion of dip by least squares; Table II, annual values of observed magnetic dip at prominent stations and comparison of observed and computed dips; two groups of stations exhibiting for every fifth year change in dip, from 1830 to 1885, to be used in connection with secular variations of the horizontal component of the force, and of the total force; type curves of the secular variation of the dip; Part III, secular variation of the horizontal component of the magnetic force and of the total intensity in the United States; Table III, annual values of observed magnetic horizontal force at prominent stations; three type curves showing secular variation of the horizontal intensity—first, for the northeastern part of the United States; second, for the eastern part of the United States; third, for the western coast of the United States; secular variation of the total intensity of the magnetic force; secular variation of the dir ction of a freely-suspended magnetic needle, with a type curve, for the New England States, from 1820 to 1885; construction of isomagnetic maps of the United States, showing the distribution of the dip, and of the horizontal component and total value of the earth's magnetic intensity, for the epoch, January 1, 1885.—[Illustrations 19-24.]
1885	7	275-284	Collection of some magnetic variations off the coast of California and Mexico, observed by Spanish navigators in the last quarter of the eighteenth century.—Communicated by George Davidson, Assistant. Prefatory letter; table of results obtained during the voyage of the frigate Santiago for discovery of north coast of California; table of results obtained by frigate Santiago and schooner Sonora; table of results obtained by Sr. Virey and Antonio Bucareli, commanding two frigates in expedition of 1779; table of results obtained during the voyage of 1788, in vessels Princessa and San Carlos, northern coast of California; table of results obtained during the voyage of the packet San Carlos from Ounalaska to San Blas (coincidently with frigate Princessa); table of results obtained during the voyage from San Blas to Nutka, 1790; record of the packet Philipino, commanded by Fidalgo in his voyage of discovery, in 1790, from Nutka to Prince William, Cooks River, and return to Monterey; record of the sloop Princess Royal, voyage from Santa Cruz to Straits of Fuca, year 1790, commanded by Don Manuel Quimper.
18	12	291-407	The secular variation of the magnetic declination in the United States and at some foreign stations (sixth edition, greatly enlarged. April, 1887).—By Charles A. Schott, Assistant. Introduction; the magnetic declination; the solar-diurnal variation; the annual variation; the secular variation; magnetic disturbances or storms; historical note; the declination; isogonic charts; the secular variation of the declination; analytical expression of the secular variation of the magnetic declination; illustration representing graphically the secular variation of the magnetic declination at Paris, France, from 1540 to 1900; collection of observed magnetic declinations suitable for the investigation of the secular variation; Group I, series of magnetic stations, mainly on the Atlantic coast, and in the region east of the Appalachian range, 43 stations; results for Group I, with an analytical expression (in which the magnetic declination is expressed as a function of the time) for each station; Group I, comparison of observed and computed magnetic declinations; results for Group I, completed; Group II, series of magnetic stations, mainly in the central part of the United States, between the Appalachian and Rocky Mountain ranges, 24 stations; results for group, with an analytical expression for each station in which the magnetic declination is expressed as a function of the time; Group II, comparison of observed and computed magnetic declinations; results for Group II completed; Group III, collection of magnetic declinations from the

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			earliest to the present time, observed on or near the Pacific coast of the United States and west of the Rocky Mountains and extending over the region from the Isthmus of Tehuantepec, Mexico, northward to Bering Strait and the Arctic Ocean, coast of Alaska; subdivision into groups from A to G; thirty-nine magnetic stations, mainly on the Pacific coast and in the region west of the Rocky Mountains; results for Group III, with an analytical expression for each station in which the magnetic declination is expressed as a function of time; Group III, comparison of observed and computed magnetic declination; results for Group III completed; graphical illustration of the secular variation, illustration No. 31; secular change in the position of the agonic line of North Atlantic between 1500–1900, illustration No. 33; progressive change in the secular variation, with a discussion of the subject; the probable errors of some of the early observations.—[Illustrations 29–33.]
1887	10	207–210	The magnetic work of the Greely Arctic Expedition.—Abstract of a report by Charles A. Schott, Assistant. A short historical account of the expeditions sent out in command of Lieut. Greely and Lieut. Ray; astronomical and magnetic work of Sergeant Israel; magnetic observatory at Fort Conger; determination of latitude, longitude, and azimuth; the number of magnetic observations and scheme for observing the declination; solar-diurnal variation; annual variation; hourly observations; term-day and term-hour observations; observations of oscillations; observations for dip; dates of aurora displays; tables of magnetic results derived from the work of other Arctic explorers; annual change in declination in this region; importance of a redetermination of the American pole of dip.
1888	.....	25–28	Bulletin No. 5.—The value of the "Arcano del Mare" with reference to our knowledge of the magnetic declination in the earlier part of the seventeenth century.—(Two illustrations.)—By C. A. Schott, Assistant.
1888	.....	29–33	Bulletin No. 6.—Secular variation in the position of the agonic line of the North Atlantic and of America between the epochs 1500 and 1900 A. D.—(Three illustrations.)—By Charles A. Schott, Assistant.
1888	.....	35–40	Bulletin No. 7.—Historical review of the work of the Coast and Geodetic Survey in connection with terrestrial magnetism.—By Charles A. Schott, Assistant. (Four illustrations.)
1888	6	167–176	(Same title as Bulletin No. 5—1888.) The value of the Arcano del Mare, etc. (Two illustrations.)
1888	7	177–312	The secular variation of the magnetic needle in the United States and at some foreign stations.—By Charles A. Schott, Assistant. (Seventh edition, June, 1889.) Introduction; the magnetic declination; the solar-diurnal variation; the annual variation; the variation depending on the solar rotation; the lunar inequalities; the secular variation; plate showing secular variation of the magnetic declination at Paris, France; magnetic disturbances or storms; historical note; the declination; isogonic charts; the secular variation of the declination; analytical expression of the secular variation of the magnetic declination; collection of observed magnetic declinations suitable for the investigation of the secular variation; Group I.—Series of magnetic stations mainly on the Atlantic coast and in the region east of the Appalachian range; list of stations and explanation of tables; Group I.—Collection of observed magnetic declinations, eastern series; results for Group I; Group I.—Comparison of observed and computed magnetic declinations; results for Group I, continued; Group II.—Series of magnetic stations mainly in the central part of the United States between the Appalachian and Rocky Mountain ranges; results for Group II; Group II.—Comparison of observed and computed magnetic declinations; results for Group II, continued; Group III.—Collection of magnetic declinations from the earliest to the present time, observed on or near the Pacific coast of the United States and west of the Rocky Mountains, and extending over the region from the Isthmus of Tehuantepec, Mexico, northward to Bering Strait and the Arctic Ocean, coast of Alaska; map showing isogonic lines for the year 1783, constructed from observations made by Spanish navigators between 1774 and 1790, San Blas, Mexico, to Vancouver Island; results for Group III; Group III.—Comparison of observed and computed magnetic declinations; graphical illustration of the secular variation and of the annual change (plate and text); secular variation in the position of the agonic line of the North Atlantic and of America between the epochs 1500 and 1900 A. D. (1 plate); plate showing isogonic curves of 1700–1750 A. D.; progressive change in the secular variation; early attempts to locate the North American magnetic pole.

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1889	11	233-402	The distribution of the magnetic declination in the United States for the epoch of 1890. Table of contents; list of illustrations; introduction; retrospective view of work done by the Coast and Geodetic Survey relating to magnetic declinations; theory and effect of local disturbances in the distribution of the declination, dip, and intensity; collection and tabular arrangement of magnetic declinations; general distribution of data in the States, Territories, and other geographical divisions; table of observed declinations and values reduced to the year 1890; construction of the isogonic curves for the United States (exclusive of Alaska); distribution of the declination in Alaska and adjacent regions; establishment of an analytical expression for the distribution in Alaska; construction of the isogonic curves for Alaska; definition of magnetic meridians and parallels; construction of magnetic meridians for the United States (exclusive of Alaska). Illustrations: Plate No. 24, disturbed isomagnetic curves; Chart No. 25, isogonic curves for the United States (exclusive of Alaska) at the epoch 1890 (January); Chart No. 26, isogonic curves for Alaska and adjacent parts, with annual change of the declination, for 1890; Chart No. 27, magnetic meridians of the United States (exclusive of Alaska) and annual change of the declination for the epoch of 1890.
1890	8	199-241	Terrestrial magnetism.—Results from the magnetic observatory of the Coast and Geodetic Survey at Los Angeles, Cal., between the years 1882-1889. Part I, Results of the absolute measures of the direction and intensity of the earth's magnetic force.—Discussion and report by C. A. Schott, Assistant.
1890	9	243-457	Part II, Results of the differential measures of the magnetic declination, with hourly readings of the unifilar traces.—By Charles A. Schott, Assistant. (Nine illustrations.)
1890	.....	211-214	Bulletin No. 20.—The magnetic observations made on Bering's first voyage to the coasts of Kamchatka and Eastern Asia in the years 1725-1730.—Discussion by C. A. Schott, Assistant.
1890	12	625-684	Determinations of gravity and the magnetic elements in connection with the U. S. Scientific Expedition to the west coast of Africa, 1889-1890.—A report by E. D. Preston, Assistant. (Eleven illustrations.)
1891	.....	225-232	Bulletin No. 23.—The secular variation and annual change of the magnetic force at stations occupied by E. D. Preston, Assistant, U. S. Coast and Geodetic Survey, in connection with the U. S. Eclipse Expedition to the west coast of Africa in 1889-1890, in charge of Prof. D. P. Todd.—Abstract of the results of a discussion by C. A. Schott, Assistant. Submitted for publication March 16, 1891.
1891 Pt. 2	3	21-39	The secular variation and annual change of the magnetic force at stations occupied by E. D. Preston, Assistant, U. S. Coast and Geodetic Survey, in connection with the U. S. Eclipse Expedition to the west coast of Africa in 1889-1890, in charge of Prof. D. P. Todd.—Report by C. A. Schott.
1891 Pt. 2	4	41-267	Results of the observations recorded at the U. S. Coast and Geodetic Survey Magnetic Observatory at Los Angeles, Cal., in charge successively of Marcus Baker, Acting Assistant; Carlisle Terry, jr., Subassistant, and Richard E. Halter, Assistant, between the years 1882-1889. Part III, Results of the differential measures of the horizontal intensity. Discussion and report by C. A. Schott. [Ten illustrations, 1 to 10.]
1891 Pt. 2	5	269-273	On the magnetic observations made during Bering's first voyage to the coasts of Kamchatka and Eastern Asia in the years 1725-1730.—Discussion by C. A. Schott.
1891 Pt. 2	13	479-485	On observations for the variation of latitude made near Honolulu, Oahu, Hawaiian Islands, in cooperation with the work of the International Geodetic Association and on determinations of gravity and magnetic elements.—A preliminary report by E. D. Preston.
1891 Pt. 2	14	487-501	Report of an expedition to Muir Glacier, Alaska, with determinations of latitude and the magnetic elements at Camp Muir, Glacier Bay.—By H. F. Reid.—[One illustration, No. 22.]
1892 Pt. 2	7	253-327	Results of the observations recorded at the U. S. Coast and Geodetic Survey Magnetic Observatory, Los Angeles, Cal., 1882-1889. Part IV, Results of the differential measures of the vertical force component and of the variations of dip and total force. Discussion and report by C. A. Schott. [Two illustrations, Nos. 28 and 29.]

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1892 Pt. 2	11	529-533	Results of magnetic observations at stations in Alaska and in the Northwest Territory of the Dominion of Canada. Observations at five stations in Alaska by J. E. McGrath and J. H. Turner in the years 1889, 1890 and 1891.—Discussion of results and comparison with other stations by C. A. Schott.—[One illustration, No. 35.]
1893 Pt. 2	12	509-638	Determinations of latitude, gravity, and magnetic elements at stations in the Hawaiian Islands, including a result for the mean density of the earth, 1891, 1892.—Report by E. D. Preston.—[Sixteen illustrations, Nos. 22 to 37.]
1894 Pt. 2	4	87-100	Distribution of the magnetic declination in Alaska and adjacent waters for the year 1895, and construction of an isogonic chart for the same epoch.—By C. A. Schott.—[Two illustrations, Nos. 2 and 3.]
1895 Pt. 2	1	167-320	The secular variation in direction and intensity of the earth's magnetic force in the United States and in some adjacent countries.—By C. A. Schott. (Eighth edition, with one chart, three plates and four illustrations, Nos. 25 to 28.)
1896	1	147-235	Distribution of the magnetic declination in the United States for the epoch January 1, 1900.—[Third edition, with three charts.]—By Charles A. Schott, Assistant.—Submitted for publication October 17, 1896. Introduction; table of the most recent magnetic declinations observed in the United States and adjacent regions; the isogonic chart of the United States for the epoch January, 1900; construction of the lines of equal declination; table of the most recent magnetic declinations observed in the United States and adjacent regions, and referred to the epoch January 1, 1900. Three illustrations. No. 1, Isogonic chart of the United States for the epoch January, 1900; No. 2, Chart showing annual change of the magnetic declination for the period 1895-1900; No. 3, Isogonic chart of Alaska for the epoch January, 1900.

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1849	5	72-78	Mechanical record of astronomical observations.—O. M. Mitchel. Revolving disk; arrangement for recording differences of declination.
1851	9	137-145	Report on a new method of recording differences of north polar distances, or declination, by electro-magnetism.—O. M. Mitchel.
1854	40	122-127	Solar eclipse, May 26, 1854. Observations made at Brooklyn, Long Island, reported by E. Blunt; at Seaton station, Washington, D. C., by C. O. Boutelle; at Roslyn station, near Petersburg, Va., by L. F. Pourtales; Black Mountain station, Cal., by R. D. Cutts; Benicia, Cal., by Prof. James Nooney; Humboldt Bay, Cal., by G. Davidson, Assistant.
1855	45	278-286	Star catalogues.—C. A. Schott, Assistant. Comparison of star places given in Rümker's and the Twelve-Year Catalogues.—Table I, comparison of right ascensions; Table II, of north polar distances.
1860	21	229-275	Solar eclipse, July 18, 1860.—Prof. Stephen Alexander. Results of the expedition to Aulezavik Island, Labrador, to observe the total eclipse of the 18th of July, 1860; tabular comparison of chronometers; arrangement and programme; description of the telescopes employed; synopsis of the observations; times of contacts; same in local mean time (civil reckoning); other observations; reports from special parties; earth temperature (Aulezavik); atmospherical electricity; icebergs, mirage, etc.; triple rainbow; auroras; table of meteorological observations made during the hours corresponding to the eclipse at Aulezavik, from July 14 to July 23, and during the continuance of auroras from June 30 to August 6; observations with Arago's polariscope; report of photographers; changes of illumination; seamen's observations; winds; magnetic elements; longitude by chronometers.—[Sketch 39.]—[Errata 239, 275: 160, p. xx.]
1860	2	275-292	Solar eclipse.—Lieut. J. M. Gilliss, U. S. N. On the results of observations made near Fort Steilacoom, W. T., on the solar eclipse of July 18, 1860; preliminary; table of meteorological observations on Muck Prairie; latitude observations; time observations; chronometer errors and rates; longitude; the eclipse; reports from special parties.
1861	16	182-195	Report upon the determination of the longitude of America and Europe from the solar eclipse of July 28, 1851.—By Benjamin Peirce, LL. D.

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1861	17	196-221	Report of Professor Benjamin Peirce on an example for the determination of longitudes by occultations of the Pleiades.
1861	19	232-239	Solar eclipse of July, 1860.—A. D. Bache, Superintendent. Abstract of observations made at Gunstock Mountain, N. H.; (1) dispositions; (2) first contact; (3) positions of spots; I, table of observations, July 17; II, July 18, before; III, during; IV, after the eclipse; (4) occultation of spots; (5) last contact; (6) phenomena.—[Sketch 29.]—[Errata 232: 1862, front leaf.]
1861	20	239-241	Solar eclipse of July, 1860.—C. A. Schott, Assistant. Abstract of observations made at the Coast Survey Office, Washington, D. C.; first contact; last contact; after the eclipse; heliographic position of the spots.
1861	21	241-242	Solar eclipse of July, 1860.—Dr. B. A. Gould, Assistant. Abstract of observations made at Cambridge, Mass.
1861	25	259-261	Solar spots.—C. A. Schott, Assistant. Abstract of observations made at the Coast Survey Office, Washington, D. C.; table from August, 1860, to December, 1861, and monthly relative numbers, compared with Wolf's revised numbers; spotless days.—[Sketch 29.]
1862	12	155, 156	On the computations of the occultations of the Pleiades for longitude.—Report by Prof. Benjamin Peirce, of Harvard.
1862	13	157, 158	Upon the Tables of the Moon used in the reduction of the Pleiades.—By Prof. Benjamin Peirce, of Harvard.
1862	.....	15	Standard places of fundamental stars (first edition).—Dr. B. A. Gould, Assistant.
1862	21	231-232	Solar spots.—Report on observations made at the Coast Survey Office from January to August, 1862.—By C. A. Schott, Assistant.
1865	15	152-154	Report and tables on the declinations of standard time-stars.—Dr. B. A. Gould, Assistant.
1865	16	155-159	Report and tables on the positions and proper motions of the four polar stars.—Dr. B. A. Gould, Assistant.
1866	.....	15	Standard places of fundamental stars (second edition).—Dr. B. A. Gould, Assistant.
1869	7	113-115	Local deflections of the zenith in the vicinity of Washington City.—C. A. Schott, Assistant.
1869	8	116-198	Solar eclipse, August 7, 1869. Reports of observations of the eclipse of the sun on August 7, 1869, made by parties of the Coast Survey at the following stations: Bristol, Tenn., in charge of R. D. Cutts; Shelbyville, Ky., J. Winlock and G. W. Dean; Springfield, Ill., C. A. Schott; Des Moines, Iowa, J. E. Hilgard; Kohklux, Chilkaht River, Alaska, G. Davidson.—General path of the eclipse; contacts; obscuration of solar spots; breaking of sun's limb by lunar asperities; effects of optical inaccuracies; totality; protuberances; corona; emergence; northern and southern limits of totality ascertained; spectroscopic observations; photographic records; reduction of micrometric photograph measures; deviation of photographed sun's outline from a circle, after corrections; computations of results.—[Sketches 24, 25, and 26.]—[Errata 165.]
1870	16	115-177	Reports of observations upon the solar eclipse of December 22, 1870; extent of the corona as indicated by the spectroscope, p. 150; nature of the coronal envelope and its relation to the sun, p. 152; constitution of the solar atmosphere, p. 153; suggestions with reference to the observation of future eclipses, pp. 154-158.
1870	16	229	Report on the solar eclipse of December 22, 1870.—*Prof. Benjamin Peirce*, LL. D.—[From report for 1871.]
1871	13	176-179	Total solar eclipse, December 22, 1870.—G. W. Dean, Assistant. Abstract of the chronographic record.
1871	14	180-184	Total solar eclipse, December 22, 1870.—Prof. C. H. F. Peters.
1871	16	189-191	New form of mercurial horizon.—J. Homer Lane. Directions for setting up and using.

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1872	8	75-172	Reports of the astronomical and meteorological observations made at Sherman, Wyo. T.—R. D. Cutts, Assistant, and Prof. Charles A. Young. Part I, Report of R. D. Cutts [Sketch No. 18 A]. Latitude and longitude of Sherman; terrestrial magnetism; meteorology; Table I, difference of reading of observers; Table II, daily means; diagram 1; Table III, hourly means; diagram 2; Table IV, hourly means; aneroid barometer; solar radiation; Table V, amount of solar radiation; Table VI, solar radiation; altitude of the sun; atmospheric electricity; diagram; Table VIII, altitude of the astronomical station; spirit level; barometer; Tables IX, X, XI; boiling-point apparatus; Table XII, temperature of boiling water at Sherman; Table XIII, height of Long's Peak, etc.; Sherman, its atmosphere and climate; meteorological journal.
		155	Part II, Report of Prof. C. A. Young. Spectrum of the chromosphere; catalogue of bright lines in the spectrum of the chromosphere, 1872; table showing the number of coincidences between the bright lines observed in the spectrum of the chromosphere and those in the spectrum of the chemical elements; spectra of sun spots; catalogue of lines affected in the spot-spectrum between *B* and *b*; solar eruptions and other disturbances.
1872	9	173-176	Astronomical observations on the Sierra Nevada.—George Davidson, Assistant. Description of the country adjacent to the station at Summit; the climate and opportunities for observing; the observations; Polaris, Saturn, Moon, etc.
1873	14	138-174	A list of stars for observations of latitude.
1873	15	175-180	Errata in the Heis Catalogue of Stars.
1874	10	131-133	Transit of Venus, 1769.—C. A. Schott, Assistant. Results of observations for determining positions occupied in Lower California and at Philadelphia.—[Sketch No. 22.]
1875	13	222-239	Transit of Venus, Japan, 1874.—George Davidson, Assistant. Station near Nagaski, Japan; observers; telegraphic longitude work; details of observations of the Transit; photographic work; observations at great elevations.
1875	14	231-248	Transit of Venus, Chatham Island, 1874.—Edwin Smith, Assistant. Station: foundation; instruments; [Sketch No. 25]; observations; photography; day of transit; work after the transit; computations and results; latitude observations; mean places of stars observed for latitude; results for latitude; magnetic observations; declination; dip, horizontal intensity; results.
1876	7	83-129	A catalogue of stars for observations of latitude.
1878	6	81-87	Transit of Mercury, Summit Station, Central Pacific Railroad [Sketch No. 27].—B. A. Colonna, Assistant. First external and internal contacts; second internal and external contacts; extracts from record book of observations, by B. A. Colonna; diagram; observation of contacts, by J. F. Pratt, Assistant.
1878	7	88-91	Transit of Mercury, Washington, D. C.—C. A. Schott, Assistant. Observations by R. D. Cutts, William Eimbeck, and O. H. Tittmann, Assistants.
1882	20	463-468	The total solar eclipse of January 11, 1880, as observed at Mount Santa Lucia, California.—By George Davidson, Assistant. Selection of Mount Santa Lucia; height and topography of surrounding country; instrumental outfit; facilities afforded Prof. Frisby, of the U. S. Naval Observatory, and facilities afforded by the Southern Pacific Railroad and Mr. Newhall; examination of approaches to mountain; determination of latitude and time; plan of observing eclipse; instruments and observers; condition of atmosphere on day of eclipse; steadiness of limb of Sun; observation of first contact; disappearance of the umbra; sharpness of Sun's cusps; apparently doubled by atmospheric disturbance; duplication of cusp, shown by Fig. 1; difference in the darkness of sky adjacent to Sun's disk; sharpness of cusps 50 minutes after commencement; one hour after commencement limb of Moon steady enough to see lunar mountains near apparent right cusp, Fig. 2; irregularities of lunar outline; atmosphere slightly disturbed by cirrus clouds toward totality; long and narrow crescent of sunlight as totality rapidly approaches, illustrated by Fig. 3; no distortion from atmospheric disturbances; only slight shivering; cusps very sharp; last line of sunlight first broken by the lunar mountains; absence of "Bailey's beads;" colored glass used in observing contact; on account of small diameter of

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			cone, the brightness of corona, and the effect of cirrus clouds, sky too bright to see any stars or small planets; study of rose-colored flames and first circle of bright light; Fig. 4, corona sketched; shape of brilliant rose-colored flames; brightness of first concentric ring of white light; second and fainter concentric ring; sketch of corona immediately after totality; agreement of outline and general features, as noted by different observers; rapid change in appearance of corona, as noted by some of the observers; third contact observed; shadow of total phase seen on ocean before totality; shade of retreating cone seen on sky after totality, but no shadow seen on the dark mountains; clouds interfere and fourth contact unsatisfactorily observed; table giving times of contacts, as noted by different observers; temperature and barometric readings; Jupiter and Mars seen before totality; no stars seen; limits of the southern line of totality; eclipse observed by Dr. Eisen, at Borden, on Southern Pacific Railroad; extract from his report, with sketch, Fig. 5; Mr. Moore, at San Rafael, sees irridescent colon at part of Sun first touched by Moon; eclipse of 1869, in Alaska, contrasted with eclipse of 1880, in California; confirmation of theory that "Bailey's beads," "ligament," and "black drop" are due to atmospheric disturbances; zodiacal light observed at Mount Santa Lucia; geographical position of station.—[Illustrations 51, 52.]
1882	21	469-502	A new reduction of La Caille's observations, made at the Cape of Good Hope between 1749 and 1757, and given in his "Astronomiæ Fundamenta," together with a comparison of the results with the "Bradley-Bessel" "Fundamenta;" also, a catalogue of the places of 150 stars south of declination —30°, for the epochs 1750 and 1830.—By C. R. Powalky, Ph. D. Prefatory note by J. E. Hilgard; preface; introduction; examples of observations with a sextant at Paris; Table I, right ascensions; Table II, declinations; Table III, declinations continued; Table III*a*, declinations, with sector, at Paris, continued; Table IV, declinations, with sextant at the Cape compared with La Caille in his "Astronomiæ Fundamenta;" Table IV*a*, sextant at the Cape; Table IV*b*, sector at the Cape; Table V, mean declination for 1750 (corrected); results compared; Table VI, catalogue of 150 fixed stars, south of 30° declination, from La Caille's observations at the Cape of Good Hope, in his "Astronomiæ Fundamenta" for 1750.0 and for 1830.0, without regard to proper motions; report on the preceding reduction of La Caille's observations by Prof. C. H. F. Peters.
1883	15	369-370	The transit of Mercury of November 7, 1881, as observed at Yolo Base, California.—By George Davidson and J. J. Gilbert, Assistants. Point of observation; instruments used; geographical position of station; first contact lost; observed time of second contact; estimated time when the planet was one diameter on sun's disk; appearance of planet when on face of the sun; observations of error of chronometer with sextant; observation of transit at Middle Base Camp; instruments and observer; geographical position of station; observed time when planet one-fifth diameter on sun; observed time of second contact; error of watch from sextant observations; remarks; condition of atmosphere at time of transit; topography of surrounding country; sun's disk, at time of ingress, not sharp at first station; "black ligament," "black drop," etc., seen; not seen at second station; closeness of two observed times; atmospheric disturbances; similar disturbances of signals in the daytime observations of geodetic work; intense blackness of planet's disk; problematical planet Vulcan should have been seen if it existed; time and geographical positions determined by Mr. Hill.
1883	16	371-378	Observations of the transit of Venus of December 6, 1882, at Washington, D. C., at Tepusquet Station, California, and at Lehman's Ranch, Nevada.—Location of station at Washington; instruments and observers; first external contact; first internal contact; second internal contact; the last contact; error of chronometer, from Naval Observatory time-ball.—Charles A. Schott, Assistant; J. G. Porter, Computer, Coast and Geodetic Survey. Observations by B. A. Colonna, Assistant; prefatory remarks; instruments for time and for observation; comparison of timepieces; first external contact; note; second interior contact; note; second exterior contact; note. Mr. P. A. Welker's observations of third and fourth contacts at station Tepusquet, Cal.; station; observer; instruments; outlines very sharp and distinct; observed times of third and fourth contacts; hourly rate of chronometer.—Reported by James S. Lawson, Assistant. Assistant Eimbeck's observations of third and fourth contacts at Lehman's Ranch, Nevada.—Geographical position of station; instrument used; atmospheric conditions; observed time of third and fourth contacts; chronometer used and its errors; method of observing; no "black drop" seen; contacts well observed; defective arrangement for screening down sun's excessive light; comparison of chronome-

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			tors; Mr. Marr's results compared with Mr. Eimbeck's; no delay in the regular work of the Survey.—William Eimbeck, Assistant. Mr. Marr's observations of third and fourth contacts.—Instrument used; atmosphere; observed time of third contact; observed time of apparent middle of planet; observed time of fourth contact; appearance of sun and planet.—R. A. Marr, Aid.
1883	18	383–471	Field catalogue of 1278 time and circumpolar stars—mean places for 1885.0.—By George Davidson, Assistant.
1886	6	153	The solar (annular) eclipse of March 5, 1886.—Reported by George Davidson, Assistant. Prefatory letter: observations made at the Coast and Geodetic Survey station, Lafayette Park, San Francisco, Cal., and at the Davidson Observatory; observations of first and second contacts; instruments and observers.
1888	13	465–470	Differential method of computing the apparent places of stars for determinations of latitude.—By E. D. Preston, Assistant.
1889	.....	151–155	Bulletin No. 14.—Approximate times of culminations and elongations and of the azimuths at elongation of Polaris for the years between 1889 and 1910.
1891 Pt. 2	12	475–477	The transit of Mercury of May 9, 1881, as observed at Waikiki, Hawaiian Islands.—By L. D. Preston.
1891	13	479–485	On observations for the variation of latitude, made near Honolulu, Oahu, Hawaiian Islands, in cooperation with the work of the International Geodetic Association and on the determination of gravity and the magnetic elements. A preliminary report by E. D. Preston, Assistant. Submitted for publication June 17, 1893.
1896	9	347–352	Field method of reducing portable transit-time observations.—By G. R. Putnam, Assistant.
1895 Pt. 2	4	345–346	Observations of the transit of Mercury on November 10, 1894, made at the Coast and Geodetic Survey office, Washington, D. C.—Report by C. A. Schott, O. H. Tittmann, E. D. Preston, Edwin Smith, G. R. Putnam, E. G. Fischer.
1895 Pt. 2	7	371–380	Graphic method of reducing stars from mean to apparent places.—By E. D. Preston.—[Three illustrations, Nos. 35 to 37.]
1896	10	353–371	Determination of the constant of aberration from latitude observations with the zenith telescope at Honolulu, H. I., and San Francisco, Cal.—Report by E. D. Preston, Assistant.—[Two illustrations.]

MATHEMATICS.

1854	33	63–95	Computation of triangulation.—Comparison of the reduction of horizontal angles by the methods of "dependent directions" and of "dependent angular quantities" by the method of least squares.—A. D. Bache. [Sketch 58.]—[Errata, 65, 70, 72, 75, 78, 79, 91, 94: 1855, p. xix.] Adjustment of horizontal angles of a triangulation. Probable error of observation, derived from observations of horizontal angles at any single station and depending on directions.—C. A. Schott.
1854	41	131–138	Report containing directions and tables for the use of Peirce's criterion for the rejection of doubtful observations.—B. A. Gould. [Errata, p. 138.]
1855	40	255–264	Normal equations.—C. A. Schott. Solution of normal equations by indirect elimination.
1856	59	307–368	Probable error.—Article from "Astronomische Nachrichten, No. 1034," translated by C. A. Schott. Determination of the probable error of an observation by the differences of the observations from their arithmetical mean.
1860	36	361–391	Formulæ for computing latitudes, longitudes, and azimuths, with an example as used in the Coast Survey office, and tables for each minute of latitude from 23° to 50°.
1860	37	392–396	Cauchy's interpolation formulæ, with remarks by C. A. Schott.
1864	13	116–119	Problem in geodesy.—Determining a position by angles observed from it on any number of stations. Solution of Gauss, with example, communicated by C. A. Schott.

MATHEMATICS—Continued.

Year.	Appendix.	Pages.	Subject and author.
1864	21	220-222	Trajectory of ricochet shots from a 15-inch Rodman gun; notes on.—C. A. Schott.
1864	22	223	Ranges of shot from 15 and 20 inch guns, determination of, by C. A. Schott.
1869	14	235	Solution of the three-point problem, by determining the point of intersection of a side of the given triangle with a line from the opposite point to the unknown point.—A. Lindenkohl.
1870	21	200-224	On the theory of errors of observations.—C. S. Peirce.
1875	19	315-368	Formulæ and factors for the computation of geodetic latitudes, longitudes, and azimuths. (Errata, pp. 316, 317, 318, 367.) Fig. 1. L, M, Z, forms for primary and secondary triangulation, and inverse solution; tables of factors log A, log B, log C, log D, log E; table of correction to longitude for difference in arc and sine; values of $\log \frac{1}{\cos \frac{1}{2} d\mathbf{L}}$; table for referring values of coefficients A, B, C, D, E, from Bessel's to Clarke's ellipsoid; table of log F; auxiliary tables for converting arcs of the Bessel ellipsoid into arcs of the Clarke ellipsoid; formulæ and table for computing the spherical excess of a triangle; table of log m.
1876	6	81	A new system of Binary Arithmetic.—Benjamin Peirce.
1876	14	197-201	Note on the theory of the economy of research.—C. S. Peirce.
1881	.....	26	General properties of the equations of steady motion.—By Thomas Craig.
1882	.....	i-xiv 1-247	A Treatise on Projections. Part I—Mathematical Theory of Projections. Part II—Construction of Projections.—By Thomas Craig. [Treasury Department, Document No. 61, Coast and Geodetic Survey.]
1884	7	323-375	Formulæ and factors for the computation of geodetic latitudes, longitudes, and azimuths (third edition). Prefatory remarks; direct and indirect methods; Bessel's and Puissant's solutions; formulæ for dL, dM, and dZ, discussed and established; example of L, M, Z for primary triangulation; example of L, M, Z, for subordinate triangulation; the inverse problem; L. M. Z, form for inverse solution; log factors A, B, C, D, and E between latitudes 23° and 65°, based on the Clarke spheroid of 1866; table of corrections to longitude for differences in arc and sine; table of values of $\log \frac{1}{\cos \frac{1}{2} d\,\mathrm{L}}$; table of log F; formula and table for computing the spherical excess of triangles, based on the Clarke spheroid of 1866.
1885	15	503-508	Note on a device for abbreviating time reductions.—By Charles S. Peirce, Assistant.
1888	13	465-470	Differential method of computing the apparent places of stars for determinations of latitude.—By E. D. Preston, Assistant.
1890	13	685-687	On an approximate method of deducing probable error.—By C. H. Kummell, Computing Division. On the determination by least squares of the relation between two variables, etc.—By Prof. Mansfield Merriman, late Acting Assistant.
1892	12	535-552	On the direct synthetical method of adjusting a triangulation.—By C. A. Kummell.
1894	9	277-348	Formulæ and tables for the computation of geodetic positions (fourth edition). Prefatory remarks; formulæ and factors for the computation of geodetic latitudes, longitudes, and azimuths; form for primary triangulation; form for subordinate triangulation; form for inverse problem; table of corrections to longitude for differences of arc and sine; table of values of log sec. $\frac{1}{2}(\Delta\phi)$; tables for converting meters to feet and feet to meters; tables for converting kilometers to statute miles, and statute miles to kilometers; formulæ and table for computing the spherical excess of triangles; tables for M computed for the Clarke spheroid; table of logarithms of factors A, B, C, D, E, F, based upon the Clarke spheroid of 1866 and the metric system, between latitudes 18° and 72°.—By C. A. Schott.—[Two diagrams.]
1896	7	293-298	A new solution of the geodetic problem.—By Chas. H. Kummell.
1896	12	395	Logarithms, their nature, computation, and uses, with logarithmic tables of numbers and circular functions to ten places of decimals.—Part 1, by W. W. Duffield, Superintendent.—Two illustrations.

DRAWING, ENGRAVING, AND ELECTROTYPING.

Year.	Appendix.	Pages.	Subject and author.
1851	55	541-553	Electrotyping operations of the Coast Survey.—G. Mathiot. Adhesion of deposit to matrix; actions in the electrolytic solution; laboratory apparatus; manipulation.—[Sketch 58.]
1852	21	108-111	On lithographic-transfer printing.—Maj. I. I. Stevens, U. S. Engineers.
1853	36	90-93	Notes on lithography and lithographic transfer.—Lieut. E. B. Hunt, U. S. Engineers.
1854	31	54-57	On electrotype operations and chemiglyphic experiments.—G. Mathiot.
1854	56	193-201	Mathiot's self-sustaining battery.—G. Mathiot. Its principles and workings.—[Errata, pp. 194, 198; 1855, p. xix.]
1854	57	201-212	Art and practice of engraving.—Lieut. E. B. Hunt, U. S. Engineers. Coast Survey engraving; its office, organization, and history.—[Errata, p. 204; *see* Index of errata.]
1855	61	366-368	Galvanic experiment.—G. Mathiot. Time required to produce the maximum intensity of a voltaic current.
1855	62	369	Electrotype art.—G. Mathiot. Improved method for joining detached plates by electrotyping.
1855	63	370-373	Mathiot's branch-circuit galvanometer.—G. Mathiot. On a method of measuring galvanic currents of great quantity.
1856	62	316-317	Electrotypes.—G. Mathiot. On the result of experiments made in printing from thin plates.
1860	20	216-229	Topographical and hydrographical delineations.—H. L. Whiting, Assistant. On the contouring and reduction of maps; on the scale of shades, and on the application of photography in preparing details for the engraver; (1) generalization of contour and other natural features for reduction to 1-80,000 contour; salt marsh; sand beaches and sand hills; woods; fresh marsh; shore line; low water; (2) hydrographic reductions; (3) reductions by photography; (4) scale of shades; report of E. Hergesheimer, Assistant.
1860	40	398-399	Dividers for tidal curves. Description of form invented by J. R. Gilliss for graphical decomposition.—[Sketch 40.]
1861	15	180-181	Drawing paper. Results of experiments made on the relative expansion and contraction, under atmospheric changes, of parchment paper and backed antiquarian paper.—[Sketch 31.]
1862	27	255	Drawing paper tested with reference to expansion and contraction under atmospheric changes.
1863	24	206-207	Harrison globe lens.—J. E. Hilgard, Assistant, in charge of the Office. On tests made at the Coast Survey Office.
1866	20	130-138	Electrotyping operations.—G. Mathiot. Historical; adhesion of deposit to matrix; time and expense of electrocasting; actions in the electrolytic solution; laboratory apparatus; manipulation.
1867	5	55-56	The pantograph; its use in engraving.—E. Hergesheimer, Assistant.—[Sketch 27.]
1875	6	87	Report upon electrotyping and photographing.—Dr. A. Zumbrock.
1879	11	191	Preparation of standard topographical drawings.—E. Hergesheimer, Assistant.—[Plates 42 to 49.]
1881	7	124-125	Type forms of topography, Columbia River.—By E. Hergesheimer, Assistant.—[Illustration 33.] (*See* Topography.)
1883	14	367-368	Report on the preparation of standard topographical drawings.—By E. Hergesheimer, Assistant.—[Illustrations 35-50.] (*See* Topography.)

MISCELLANEOUS.

Year.	Appendix.	Pages.	Subject and author
1817	.....	.....	An account of pyrometric experiments made at Newark, N. J.—F. R. Hassler, Superintendent. [Transactions American Philosophical Society. New Series, Vol. I, pp. 210-227.]
1851 1866	10 19	145-160 120-130	Florida reefs, keys, and coast.—Prof. Louis Agassiz. Topography of Florida; mode of formation of the reef; animal life; the keys; coral reefs; ship channel; the mainland; coast survey; physical changes in the Gulf Stream; changes in ages to come.
1853	18	50, 51	Climate, soil, and general character of Florida Keys.—Lieut. James Totten, U. S. Army.
1853	35	89	Boiler incrustation.—J. Hewston, jr. Analysis of two specimens of deposit from the boiler of the Coast Survey steamer Hetzel.
1854	55	192	On the action of sea water on metals.—J. E. Hilgard, Assistant. On the action of sea water on metals used in the construction of instruments and on magnetic needles; Phœnix disaster.—[Errata, p. 192, 5 from bottom, word 9, *read* presence.]
1855	26	176-185	Descriptive report of localities on the western coast, from the north end of Rosario Strait, Washington Territory, to the southern boundary of California.—G. Davidson, Assistant.
1856	63	317-318	Analysis of sea water.—Chemical analysis of the water of New York Harbor.—Prof. Wolcott Gibbs.
1856	64	318-319	Analysis of sands from base-sites near east and south coasts of Florida.—Prof. Wolcott Gibbs. Examination of specimens of sand taken from the base-sites at Cape Florida and Cape Sable.
1856	70	335-340	Coast Survey steamer Hetzel.—Report on cause of boiler explosion.—[Sketch 67.]
1858	40	251-270	Foreign geodetic surveys.—Prof. W. P. Trowbridge, Assistant. Review showing their cost and progress, and other data, for comparison with the results of the United States Coast Survey; trigonometrical surveys of England, Ireland, and Scotland; hydrography of England; analysis of the report of the select committee appointed to consider the ordnance survey of Scotland, etc., 1856; France; India; Russia; Prussia; table of statistics of topographical maps in Europe; recapitulation; marine disasters—United States vessels, 1855, 1856, and 1857; imports, exports, tonnage, etc.; Great Britain, 1852 to 1855; Gulf of Mexico shipping; Florida reef.
1858	41	270-273	Progress of the United States Coast Survey.—Prof. W. P. Trowbridge, Assistant. Ratio of results for consecutive periods of twelve years.
1860	42	402-408	Geology of the coast of Labrador.—Notes by O. M. Lieber.
1862	25	241-248	Florida reef; its origin, growth, substructure, and chronology.—Capt. E. B. Hunt, U. S. Engineers.
1867	17	183-186	Geological and zoölogical researches; their relation and general interests in the development of coast features.—Prof. Louis Agassiz.
1870	19	182-189	On the phosphate beds of South Carolina.—Prof. N. S. Shaler.
1872	11	213-221	Voyage of the steamer Hassler from Boston to San Francisco.—L. F. Pourtales, Assistant.
1873	.....	.....	On the air contained in sea water.—Oscar Jacobsen.
1874	13	148-151	Economy in coal, as exemplified by the action of compound engines in the steamer Hassler.—Charles E. Emery. General description of the Hassler.
1876	13	192-196	On marine governors.—Charles E. Emery.
1879	12	192-198	Reconstruction of the dividing engine of the Coast and Geodetic Survey.—G. N. Saegmuller. Table of corrected screw readings for every degree; Table I, residual errors of graduation of theodolites Nos. 5, 118, 133; Table II.
1879	14	201	Internal constitution of the earth.—Benjamin Peirce

MISCELLANEOUS—Continued.

Year.	Appendix.	Pages.	Subject and author.
1880	12	145-171	Blue clay of the Mississippi River.—George Little. List of authorities; geological history of the Mississippi River; southern drift; bluff or loess; loess or loam; the Mississippi bottoms; Port Hudson; water; soils I to V, analysis; summary; sections 1 to 44; formations, sections, and localities tabulated.—[Sketch No. 48.]
1880	.....	.....	On steady motion in an incompressible viscous fluid.—Thomas Craig.
1884	8	377-385	The run of the micrometer.—By George Davidson, Assistant.
1885	11	483-485	A plea for a light on St. Georges Bank.—By Henry Mitchell, Assistant. Exact position unknown in early times; position now accurately known, but unmarked; its position with reference to important surrounding points; benefit to be derived by European commerce and that of New York, New England, and New Brunswick from light-house; size of the fishing fleet on and crossing the Bank; importance of light and horn as a guide to this fleet; great loss of life and vessels under present conditions; shoal directly on shortest route from New York to British Channel, and near routes of ocean commerce of Massachusetts Bay and Bay of Fundy; fishing fleet delayed for want of signal; loss of largest privateer of 1812 (the Dart) on St. Georges; suggestion that memorial be erected in shape of light-house.
1891 Pt. 2	11	365-474	Descriptive catalogue of publications relating to the U. S. Coast and Geodetic Survey, 1807-1890, and to U. S. Standard of Weights and Measures, 1790-1890.—Compiled by Edward Goodfellow, C. H. Sinclair, and J. B. Baylor.
1893 Pt. 2	1	1-18	State laws authorizing entrance upon lands within State limits for the purposes of the U. S. Coast and Geodetic Survey.—Compiled by G. A. Fairfield.
1893 Pt. 2	8	177-222	I, A historical account of the boundary line between the States of Pennsylvania and Delaware. II, Detailed account of work on the Pennsylvania and Delaware boundary executed by W. C. Hodgkins.—Report by W. C. Hodgkins.—[Five illustrations, Nos. 6 to 10.]
1893 Pt. 2	9	223-424	Proceedings of the Geodetic Conference held at Washington, D. C., January 9-February 28, 1894.—[Nine illustrations, No. 11 to No. 19.]
1893 Pt. 2	10	425-439	On the preparation and arrangement of the exhibit of the U. S. Coast and Geodetic Survey at the World's Columbian Exposition, 1893.—Reported by D. B. Wainwright.
1893	.....	43-98	Bulletin No. 29.—The methods and results of the U. S. Coast and Geodetic Survey as illustrated at the World's Columbian Exposition, 1893.

III.

BIBLIOGRAPHY (a); STATISTICS (b); OFFICIAL REPORTS OF EXPENDITURES AND OF PERSONS EMPLOYED (c); TABULAR STATEMENTS OF INFORMATION FURNISHED (d); ANNUAL REPORTS OF OFFICE OPERATIONS (e), AND NECROLOGY (f).

IIIa. BIBLIOGRAPHY.

U. S. COAST AND GEODETIC SURVEY.

Under this heading (IIIa) the titles of papers and documents dating from the inception of the Coast Survey until the year 1858 are taken for the most part from a collection of Coast Survey pamphlets bound together in one volume, and now in the possession of one of the compilers of this Appendix.

Year of publication.	Title.	Number of pages and size.	How printed or published.
1807	Circular of the Secretary of the Treasury (Albert Gallatin) in relation to a plan for executing the survey of the coast, addressed to Mr. Hassler, at Philadelphia, from the Treasury Department, March 25, 1807.	1, octavo.	Collection of pamphlets.
1843	Laws of 1807, 1832, and 1843 relating to the Survey of the Coast of the United States, with the plan of reorganization of 1843, and regulations by the Treasury Department.	19, octavo.	Gideon & Co., printers, Washington, D. C.
1844	Coast Survey.—Communication from the Secretary of the Treasury to the Committee of Ways and Means relative to the Coast Survey. March 9, 1844.—Read and laid upon the table.	4, octavo.	Twenty-eighth Congress, first session. Doc. No. 168 -Treasury Department.
1845	The Coast Survey of the United States.—From the American Journal of Science. Vol. XLIX.	24, octavo.	New Haven, Conn. Printed by B. L. Hamlen.
1845	The Coast Survey.—An article from the Princeton Review for April, 1845. By Joseph Henry, LL. D., Professor of Natural Philosophy in the College of New Jersey.	24, octavo.	Princeton. Printed by John P. Robinson, 1845.
1845	Report on reorganization of Coast Survey.—By the Secretary of the Treasury. Transmitting journal of Board appointed by the President to prepare plans for executing the work of the Survey. February 28, 1845.	32 pages.	Twenty-eighth Congress, second session. House Doc. No. 161—Vol. IV.
1847	The U. S. Coast Survey.—An article by C. F. Hoffman, editor of the Literary World.	4, quarto.	Literary World, New York, Sept. 11, 1847.
1847	Review of the annual report on the U. S. Coast Survey.—From the American Journal of Science and Arts. (Second series.)	11, octavo.	New Haven, Conn.
1848	Notes on the organization of the Coast Survey.	15, octavo.	
1848	Report on appropriations for Coast Survey.—By the Secretary of the Treasury. Response to Senate resolution. Statement of annual amount appropriated from commencement of Survey.	2.	Thirtieth Congress, second session. Senate Ex. Doc. No. 4—Vol. I.

IIIa. BIBLIOGRAPHY—Continued.

U. S. COAST AND GEODETIC SURVEY—Continued.

Year of publication.	Title.	Number of pages and size.	How printed or published.
1849	Letter of the Secretary of the Treasury submitting a report in reply to a resolution of the Senate of December 27, 1848, relating to the expenditures and results of the U. S. Coast Survey. February 8, 1849.—Referred to the Committee on Finance and ordered to be printed.	111, octavo.	Thirtieth Congress, second session. Senate Ex. Doc. No. 26.
1849	Report in relation to steamers of the Revenue Marine transferred to the Coast Survey.	2, octavo.	Thirtieth Congress, second session. Report No. 137, House of Representatives.
1849	Message from the President of the United States communicating a report of the Secretary of the Treasury in relation to the number and cost of vessels and number of persons employed in the Survey of the Coast of the United States, and the amount of money received from the sale of maps and charts.	9, octavo.	Thirtieth Congress, second session. Senate Ex. Doc. No. 29.
1849	Report of the Secretary of the Treasury communicating a report from the Superintendent of the Coast Survey in relation to the survey of the coast of Florida. February 17, 1849.—Laid upon the table and ordered printed.	11, octavo.	Thirtieth Congress, second session. Senate Ex. Doc. No. 30.
1849	Speech of Mr. J. A. Pearce, of Maryland, on the subject of the Coast Survey of the United States, delivered in the Senate of the United States on Saturday, February 17, 1849.	16, octavo.	Washington, D. C.—J. & G. S. Gideon, printers, 1849.
1849	Speech of Mr. Jefferson Davis, of Mississippi, on the subject of the Coast Survey of the United States, delivered in the Senate of the United States, Monday, February 19, 1849.	18, octavo.	J. & G. S. Gideon printers.
	As an appendix to the above-named speech there were printed the following reports and memorials:		
	Report of a committee of the American Academy of Arts and Sciences of Boston and Cambridge.	3, octavo.	
	Memorial of the Marine Society of Boston in relation to the Coast Survey, and memorial of the insurance companies of Boston in relation to the Coast Survey.	2, octavo.	
	Report of a committee of the Chamber of Commerce of New York, with resolutions of the same body on the U. S. Coast Survey, for transmission to Congress.	2, octavo.	
	Report of a committee of the American Philosophical Society of Philadelphia on the Coast Survey.		
	Report of a committee of the Franklin Institute of the State of Pennsylvania on the progress of he Survey of the Coast of the United States.	7, octavo.	
	Resolutions by the Board of Trade of Philadelphia relative to the Coast Survey; resolutions by underwriters, merchants, and owners of vessels of the city of Baltimore; memorial of the faculty of St. John's College, Maryland; letter from the faculty of the University of Virginia; resolutions of the Chamber of Commerce of Charleston, S. C., and resolutions of stockholders of the Mobile and Ohio Railroad—all in relation to the Coast Survey.	4, octavo.	
	NOTE.—The speeches, memorials, and resolutions above named led to the defeat of an effort made in the Senate in February, 1849, to reduce the appropriation for the Survey from $186,000 to $30,000, and to provide that it should be carried on exclusively by the Navy Department, under the direction of the President.		

IIIa. BIBLIOGRAPHY—Continued.

U. S. COAST AND GEODETIC SURVEY—Continued.

Year of publication.	Title.	Number of pages. and size.	How printed or published.
1849	Letter of the Secretary of the Treasury communicating a report by the Superintendent of the Coast Survey, dated December 26, 1848, on an application of the galvanic circuit to an astronomical clock and telegraph register in determining local differences of longitude, and in astronomical observations generally. January 6, 1849.—Laid on the table and ordered to be printed.	13, octavo.	Thirtieth Congress, second session, House Ex Doc. No. 21.
1849	Survey of the Coast of the United States.....	18, octavo.	From Hunt's Merchants' Magazine and Commercial Review, February, 1849.
1849	Reply to an article in the February number of Hunt's Merchants' Magazine on the Coast Survey of the United States.—By Lieut. Charles Henry Davis, U. S. Navy.	15, octavo.	New York.—G. W. Wood, printer, 1849.
1849	Remarks by an Assistant in the Coast Survey on an article in the February number of Hunt's Merchants' Magazine on the Survey of the Coast of the United States.	14, octavo.	J. & G. S. Gideon, printers.
1849	The U. S. Coast Survey. A reply.....	20, octavo.	Gideon, printer.
1850	Note from Prof. Bache to the editor of the Astronomical Journal, communicating an abstract of a report by Sears C. Walker, Assistant, U. S. Coast Survey, on recent telegraph operations for longitude, including experiments for wave time. Washington, February 1, 1850.	6, quarto.	The Astronomical Journal, Cambridge, Mass., April 20, 1850.
1851	Notes on the Gulf Stream.—By A. D. Bache, Superintendent U. S. Coast Survey; communicated by authority of the Treasury Department for Blunt's Memoir of the Atlantic Ocean, 1851.	16, octavo.	New York, E. & G. W. Blunt. 1851.
1851	The Coast Survey of the United States.—by Lieut. C. H. Davis, U. S. Navy. Reprinted from the American Almanac and Repository of Useful Knowledge for 1849.	28, octavo.	Washington. Gideon & Co., printers, 1851.
1851	Report of the Secretary of the Navy, in answer to a resolution of the Senate, relative to the transfer of the Survey of the Coast from the Treasury to the Navy Department. February 15, 1851.—Referred to the Committee on Finance and ordered to be printed.	14, octavo.	Thirty-first Congress, second session, Senate Ex. Doc. No. 35.
1851	Report of the Secretary of the Treasury, in answer to a resolution of the Senate, relative to the transfer of the Survey of the Coast from the Treasury to the Navy Department. February 15, 1851.—Referred to the Committee on Finance and ordered to be printed.	47, octavo.	Thirty-first Congress, second session, Senate Ex. Doc. No. 36.
1851	General rules for estimates, accounts, and classification of expenditures for the guidance of the chiefs of parties of the U. S. Coast Survey, 1851.	8, octavo.	Gideon & Co., printers.
1852	Notes on the use of the zenith telescope in determining latitudes in the Coast Survey by Talcott's method, and on the reduction of the observations.—By A. D. Bache, Superintendent U. S. Coast Survey. Reprinted from the American Journal of Science and Arts. Vol. XIV, second series.	16, octavo.	New Haven. Printed by B. L. Hamlen, 1852.
1854–1855	Consolidated alphabetical index of the ten Annual Coast Survey Reports from 1844 to 1853, inclusive.—Prepared by Lieut. E. B. Hunt, U. S. Engineers, Assistant.	50, quarto.	Appendix to the Annual Report of the Superintendent for 1854.

IIIa. BIBLIOGRAPHY—Continued.

U. S. COAST AND GEODETIC SURVEY—Continued.

Year of publication.	Title.	Number of pages and size.	How printed or published.
1854–1855	Consolidated index of sketches embraced in the Annual Coast Survey Reports from 1844 to 1853, inclusive.—Prepared by Lieut. E. B. Hunt, U. S. Engineers, Assistant.	6, quarto.	Appendix to the Annual Report of the Superintendent for 1854.
1855	An account of the measurement of two base lines in Florida. Section VI, U. S. Coast Survey.—By Fairman Rogers, Civil Engineer.	16, octavo.	From the Journal of the Franklin Institute, 1855.
1855	The U. S. Coast Survey. Its history, objects, organization, methods, and results.—From Putnam's Monthly of November, 1855.	14, octavo.	New York. Dix & Edwards. 1855.
1856	Report on an index of reference to memoirs and papers on subjects related to the Coast Survey operations.—By Lieut. E. B. Hunt, U. S. Corps of Engineers, Assistant, Coast Survey.	6, quarto.	Appendix No. 67. Report of Superintendent for 1856.
1856	On systematizing the abbreviations of titles of periodicals, transactions, etc.—By Lieut. E. B. Hunt, U. S. Corps of Engineers, Assistant, Coast Survey.	2, quarto.	Appendix No. 68. Report of Superintendent for 1856.
1858	Report of Lieut. E. B. Hunt, U. S. Engineers, Assistant in the Coast Survey, on the preparation of an index of scientific references.	11, quarto.	Appendix No. 51. Report of the Superintendent for 1857.
1858	Laws relating to the Survey of the Coast of the United States, with the plan of re-organization of 1843, and regulations by the Treasury Department.	25, octavo.	Public Printer. July, 1858.
1858	Report on the history and progress of the American Coast Survey up to the year 1858, by the Committee of Twenty appointed by the American Association for the Advancement of Science at the Montreal meeting, August, 1857.	88, octavo.	Printed by the American Association.
1858	Report of the Secretary of the Treasury, showing the amount expended and the progress made in the Coast Survey, and also in the standard weights and measures furnished to the several States and custom-houses, and their cost.	287, octavo.	Thirty-fifth Congress, second session, Vol. VI, Senate Report No. 6, part 2.
1858	Special report on the comparative progress and expenditure of the Coast Survey in different years. Foreign surveys, etc.	18, octavo.	Washington. Polkinhorn, printer. 1858.
1858	A popular account of the U. S. Coast Survey.	23, octavo.	From Appleton's New American Cyclopædia. 1858.
1859	Review by Prof. W. P. Trowbridge, Assistant in the Coast Survey, relating to the origin, cost, and progress of foreign geodetic surveys, with other data for comparison with the results of the U. S. Coast Survey.	20, quarto.	Appendix No. 40, Report for 1858.
1859	Comparison of the cost and progress of the U. S. Coast Survey during the periods from 1832 to 1844, and from 1844 to 1856–'57.—By Prof. W. P. Trowbridge, Assistant in the Coast Survey.	4, quarto.	Appendix No. 41, Report for 1858.
1859	List of papers accompanying a special report made to the Treasury Department by Prof. A. D. Bache, Superintendent U. S. Coast Survey, in December, 1857. (See report Thirty-fifth Congress, second session, Vol. VI, Senate Report No. 6.)	1, quarto.	Appendix No. 42, Report for 1858.
1860	Report on Mississippi Sound by the Secretary of the Treasury, in answer to a resolution of the House. Memoir with charts prepared from the archives of the Coast Survey.—By W. P. Trowbridge, April 6, 1860.	9, octavo.	Thirty-sixth Congress, first session, Ex. Doc. No. 58, Vol. IX.

III*a*. BIBLIOGRAPHY—Continued.

U. S. COAST AND GEODETIC SURVEY—Continued.

Year of publication.	Title.	Number of pages and size.	How printed or published.
1860	Message on the navigation of the Harlem River. Containing report of A. D. Bache, Superintendent U. S. Coast Survey, relating to that river and to Spuyten Duyvil Creek, April 12, 1860.	6, octavo.	Thirty-sixth Congress, first session, Ex. Doc. No. 64, Vol. IX.
1860	The U. S. Coast Survey. Review of a report of the Secretary of the Treasury.	32, octavo.	From the North American Review for April, 1860.
1860	Lecture on the Gulf Stream. Prepared at the request of the American Association for the Advancement of Science, by A. D. Bache, Superintendent Coast Survey. Read at the Newport meeting, 1860.	17, octavo.	Published in the American Journal of Science and Arts, November, 1860.
1864–1866	Consolidated alphabetical index of the ten Annual Coast Survey Reports from 1854 to 1863, inclusive. Prepared by Subassistant F. F. Nes.	227–308, inclusive, quarto.	Appendix to the Report of the Superintendent for 1864.
1864–1866	Consolidated index of sketches embraced in the Annual Coast Survey Reports from 1854 to 1863, inclusive.	309–315, quarto.	Appendix to the Report of the Superintendent for 1864.
1865	What the Coast Survey has done for the war.—By Richard Meade Bache, Assistant, U. S. Coast Survey.	24, octavo.	Reprinted from the June and July numbers of the United Service Magazine. New York, 1865.
1868	Report on losses sustained by Coast Survey officers by the sinking of the steamer Arago in the Neuse River, North Carolina, July 21, 1868.	2, octavo.	Fortieth Congress, second session, Senate Report No. 181.
1869	Statutes relating to the survey of the coast of the United States, with the plan of reorganization of 1843 and regulations by the Treasury Department.	27, octavo.	Washington. Government Printing Office, 1869.
1871–1874	General index of professional and scientific papers contained in the U. S. Coast Survey Reports from 1851 to 1870.	193–209, quarto.	Appendix No. 17, Report for 1871.
1871–1874	Errata in the Coast Survey Reports from 1851 to 1870.	210–219, quarto.	Appendix No. 18, Report for 1871.
1871	On tides and tidal action in harbors.—By J. E. Hilgard, Assistant, U. S. Coast Survey.	17, octavo.	A lecture before the American Institute, New York, January 27, 1871. Reprinted with revisions in the Smithsonian Report for 1874.
1873	The Coast Survey. A lecture delivered before the New Haven Chamber of Commerce, March 26, 1873.—By R. Meade Bache, Assistant, U. S. Coast Survey.	19, octavo.	Published by request of the Chamber of Commerce.
1875	Account of a base-line measurement, three times repeated, in the U. S. Coast Survey.—By J. E. Hilgard, of Washington, D. C.	90–98, octavo.	From the proceedings of the American Association for the Advancement of Science, Detroit meeting, 1875.
1878	Surveys of the Territories. Letter from the Acting President of the National Academy of Sciences, transmitting a report on the surveys of the Territories.	27, octavo.	Forty-fifth Congress, Third session. House Mis. Doc. No. 5.
	December 3, 1878.—Referred to the Committee on Appropriations and ordered to be printed.	.....	Published in part, also, as Senate Mis. Doc. No. 9.
1878	Memorial from Civil Engineers asking an appropriation for continuing the triangulation of the Coast Survey in certain States.	1, octavo.	Forty-fifth Congress, second session. Senate Mis. Doc. No. 58—Vol. II.

IIIa. BIBLIOGRAPHY—Continued.

U. S. COAST AND GEODETIC SURVEY—Continued.

Year of publication.	Title.	Number of pages and size.	How printed or published.
1879	Letter from the Secretary of War transmitting a copy of a communication from General Comstock, U. S. Engineers, relative to the duplication of the surveys of the Mississippi River by the Coast Survey. January 10, 1879.	3, octavo.	Forty-fifth Congress, third session. House Ex. Doc. No.20—Vol. XI.
1879	Letter from the Secretary of the Treasury transmitting a communication from the Superintendent of the Coast and Geodetic Survey relative to the cost of certain classes of the work of the Survey. January 20, 1879.	4, octavo.	Forty-fifth Congress, third session. House Ex. Doc. No.29—Vol. XI.
1879	Report by the Secretary of the Treasury relating to the organization of the Coast and Geodetic Survey.	6, octavo.	Forty-fifth Congress, third session, House Ex. Doc. No.62—Vol. XVI.
1879	The Coast Survey. An article by Mrs. Martha J. Lamb.	507-521, octavo.	Harper's New Monthly Magazine for March, 1879.
1880-1882	An attempt to solve the problem of the first landing place of Columbus in the New World.—By Capt. G. V. Fox, Assistant Secretary of the Navy, 1861-1866.	346-411, quarto.	Appendix No. 18, Coast and Geodetic Survey Report for 1880.
1881	Resolution instructing Committee on Finance of the Senate to make certain inquiries with reference to the organization of the Treasury Department, and to consider expediency of transferring certain bureaus of that Department, and among them the Coast and Geodetic Survey, to the Navy Department. January 12, 1881.	1, octavo.	Forty-sixth Congress, third session. Senate Mis. Doc. No. 16—Vol. I.
1881	Laws and regulations relating to the Coast and Geodetic Survey of the United States. Treasury Department, 1881. Document 110, Coast and Geodetic Survey.	42, octavo.	Washington, Government Printing Office, 1881.
1881	Laws of general application for the use of the U. S. Coast and Geodetic Survey. Treasury Department. Document 167, Coast and Geodetic Survey.	52, octavo.	Washington, Government Printing Office, 1881.
1881	Recent investigations of the Gulf Stream by the U. S. Coast and Geodetic Survey steamer Blake.—By Commander John R. Bartlett, U. S. N.	29-46, octavo.	Bulletin of American Geographical Society, New York, 1881—No. 1.
1881	The Basin of the Gulf of Mexico. Communication to National Academy of Sciences, November 18, 1880.—By J. E. Hilgard, M. N. A. S.	288-291, octavo.	Reprinted from the American Journal of Science, April, 1881—Vol. XXI.
881-1883	General Index of Scientific Papers, Methods, and Results contained in the Appendices to the Annual Reports of the U. S. Coast and Geodetic Survey from 1845 to 1880, inclusive.—By C. H. Sinclair, Subassistant.	91-123, quarto.	Appendix No. 6—Report for 1881.
1882	The Gulf Stream. New data from the investigations of the U. S. Coast and Geodetic Survey steamer Blake.—By Commander John R. Bartlett, U. S. N. Naval Institute, Washington Branch. May, 1882.	221-231, octavo.	Reprinted from No. 20 of the proceedings of the U. S. Naval Institute.
1883	Letter of the Superintendent U. S. Coast and Geodetic Survey on the proposed transfer to the Navy Department. January 6, 1883.	8, octavo.	
1883-1884	Descriptive Catalogue of Publications relating to the Coast and Geodetic Survey and to Standard Measures.—Compiled by Edward Goodfellow, Assistant.	121-135, quarto.	Appendix No. 6—Report for 1883.

III*a*. BIBLIOGRAPHY—Continued.

U. S. COAST AND GEODETIC SURVEY—Continued.

Year of publication.	Title.	Number of pages and size.	How printed or published.
1883	General considerations showing the impolicy of the adoption by Congress of the recommendation of the Secretary of the Navy to transfer the Coast and Geodetic Survey from the Treasury to the Navy Department.—By R. Meade Bache, Assistant.	1, quarto.	Philadelphia, 1883.
1884	The Late Attacks upon the Coast and Geodetic Survey.—By R. Meade Bache, Assistant. Reprinted from the October and November numbers of the United Service, 1884.	52, octavo.	Philadelphia. L. R. Hamersly & Co., No. 1510 Chestnut street, 1884.
1884	Notes on a proposed transfer of the Coast Survey to the Navy.—By Rear-Admiral Thornton A. Jenkins, U. S. N. 1884—June 5.	6, octavo.	Washington, D. C.
1884	U. S. Coast and Geodetic Survey. Historical Sketch.—Prepared by H. W. Blair, Assistant.	8, octavo.	Washington, D. C., June, 1884.
1884	Inquiry of the National Academy of Sciences concerning the operations of the Coast and Geodetic Survey. A statement by the Superintendent, addressed to Gen. M. C. Meigs, chairman of a committee of the National Academy of Sciences. September 19, 1884.	20, octavo.	Polkinhorn & Son, printers, Washington, D. C.
1884	Coast and Geodetic Survey; article in the Supplement to the ninth edition of the Encyclopædia Britannica; Vol. II of Supplement.—By O. H. Tittmann, Assistant.	269-272, quarto.	American edition; Philadelphia and New York. Hubbard Bros., 1884.
1884	Brief account of the exhibit made by the Coast and Geodetic Survey at the Southern Exposition, Louisville, Kentucky, 1883.—By H. W. Blair, Assistant.	489-493.	Appendix No. 18. Report for 1884.
1884	Short description of articles forming the Coast and Geodetic Survey exhibit at the Cotton Centennial Exposition, New Orleans, La., 1884-85.	25, octavo.	Washington, Government Printing Office.
1886	Testimony before the Joint Commission to consider the present organizations of the Signal Service, Geological Survey, Coast and Geodetic Survey, and the Hydrographic Office of the Navy Department.	1-36 and 1-1104, octavo.	Forty-ninth Congress, first session. Senate Mis. Doc. No. 82.
1886	Report of the Joint Commission on the Signal Service, Geological Survey, Coast and Geodetic Survey, etc.	125, octavo.	Forty-ninth Congress, first session. Senate Report No. 1285—Parts I and II.
1886	Letters of Gen. W. F. Smith and Gen. H. G. Wright, relative to the topographical work of the U. S. Coast and Geodetic Survey. June 30 and July 1, 1886.	3, quarto.	Washington, 1886.
1887-1889	General index to the progress sketches, and illustrations, maps, and charts published in the Annual Reports of the U. S. Coast Survey and U. S. Coast and Geodetic Survey, from 1844 to 1885, inclusive.—Prepared by Edward Goodfellow, Assistant.	217-268, quarto.	Appendix No. 12. Report for 1887.
1888	U. S. Coast and Geodetic Survey. Historical compilation. A statement by the Superintendent on the basis of the Historical Sketch of 1884.	16, octavo.	Washington, 1888.
1887-1889	A Bibliography of Geodesy.—By J. Howard Gore, B. S., Ph. D., professor of mathematics, Columbian University, Acting Assistant, U. S. Coast and Geodetic Survey, etc.	313-512, quarto.	Appendix No. 16. Report for 1887.
1888	The U. S. Coast and Geodetic Survey.—By Henry P. Wells.	quarto.	Supplement to Harper's Weekly, Oct. 20, 1888.
1888	Short descriptions of articles forming the Coast and Geodetic Survey exhibit at the Centennial Exposition of the Ohio Valley and Central States, Cincinnati, Ohio, 1888.—Compiled and arranged by C. O. Boutelle, Assistant.	44, octavo.	Washington, D. C. Polkinhorn, printer.

1887 Regulations

III*a*. BIBLIOGRAPHY—Continued.

U. S. COAST AND GEODETIC SURVEY—Continued.

Year of publication.	Title.	Number of pages and size.	How printed or published.
1889-1890	Coast Survey.—An article by J. E. Hilgard, ex-Superintendent in Johnson's (revised) Universal Cyclopædia, Vol. II.	123-126, quarto.	New York. A. J. Johnson & Co.
1889-1891	International Geodetic Association, ninth conference. Paris, 1889. Report of George Davidson, Assistant, U. S. Coast and Geodetic Survey. Delegate appointed by the President of the United States.	493-503, quarto.	Appendix 18. Report for 1889.
1890-1891	International Geodetic Association, ninth conference. Address of George Davidson, Assistant, U. S. Coast and Geodetic Survey. Delegate from the United States.	721-733.	Appendix 17. Report for 1890.
1890	Standing of Coast Survey officers during the Civil War. Referred to the House Calendar May 26, 1890, and ordered to be printed. Report submitted by Mr. Spooner, from the Committee on Military Affairs.	2, octavo.	Fifty-first Congress, first session, House Report No. 2151.
1890	An act to define the standing of officers of the Coast Survey during the late Civil War. Passed the House of Representatives, September 17, 1890. In Senate, September 18, 1890, read twice and referred to the Committee on Military Affairs.	2, octavo.	Fifty-first Congress, first session, H. R. 6964.
1891	Descriptive Catalogue of publications relating to the U. S. Coast and Geodetic Survey, 1807 to 1890, and to the U. S. Standard Weights and Measures, 1790 to 1890.—Compiled by Edward Goodfellow, C. H. Sinclair, and J. B. Baylor, Assistants.	365-474, octavo.	Appendix 11, 1891.
1893	On the preparation and arrangement of the exhibit of the United States Coast and Geodetic Survey at the World's Columbian Exposition, 1893.—Reported by D. B. Wainwright.	15, octavo.	Appendix 10. Annual Report for 1893, Part II.
1893	Bulletin No. 29.—The methods and results of the U. S. Coast and Geodetic Survey as illustrated at the World's Columbian Exposition, 1893.	56, octavo.	Pamphlet. Government Printing Office.

III*b*. STATISTICS.

U. S. COAST AND GEODETIC SURVEY.

Under III*b*, Statistics, an enumeration will be made for each Annual Report published by the Survey, beginning with the Report for the year 1849, of the Appendices which contain results of the work in the form of tables of statistics. The Report for 1849 is the first in which a full tabular statement of statistics is given.

Year of Report.	Number of Appendix.	Title.	Number of pages and size.
1849		Results of the Coast Survey at different periods from 1807 to 1849	1, octavo.
		Results of the Coast Survey at different periods from—	
1850	39	1844 to 1850	2, octavo.
1851	5	1844 to 1851	3, octavo.
1852	4	1844 to 1852	1, quarto.
1854	7	1844 to 1854	1, quarto.
1855	7	1844 to 1855	1, quarto,
1856	7	1844 to 1856	1, quarto.

III*b*. STATISTICS—Continued.

U. S. COAST AND GEODETIC SURVEY—Continued.

Year of Report.	Number of Appendix.	Title.	Number of pages and size.
1857	7	Statistics of field and office work of the Coast Survey. (These statistics are arranged in a table, the first column of which shows the statistics previous to 1844; the next column gives those for 1844, and the following columns those for each subsequent year, the last being for 1856, and the final column one of totals.)	2, quarto.
		Statistics of field and office work of the U. S. Coast Survey during the years previous to 1844 and thence to and including—	
1858	8	1857	3, quarto.
1859	7	1858	3, quarto.
1860	7	1859	2, quarto.
1861	5	1860	3, quarto.
1862	3	1861	3, quarto.
1863	3	1862	4, quarto.
1864	3	1863	2, quarto.
1865	3	1864	2, quarto.
		Statistics of field and office work of the U. S. Coast Survey—	
1872	2	During the years previous to 1865, and thence to and including 1871	2, quarto.
1873	2	During the year 1872	2, quarto.
1874	2	During the year 1873	2, quarto.
1875	2	During the year 1874	2, quarto.
1876	2	To the close of the year 1875	2, quarto.
1877	2	To the close of the year 1876	2, quarto.
1878	2	To the close of the year 1877	2, quarto.
		Statistics of field and office work of the U. S. Coast and Geodetic Survey—	
1879	2	To the close of the year 1878	2, quarto.
1880	2	To the close of the year 1879	2, quarto.
1881	2	For the year ending December 31, 1881	2, quarto.
1882	2	For the eighteen months ending June 30, 1882	2, quarto.
		Statistics of field and office work of the U. S. Coast and Geodetic Survey for the year ending June 30—	
1883	2	1883	2, quarto.
1884	2	1884	2, quarto.
1885	2	1885	2, quarto.
1886	2	1886	2, quarto.
1887	2	1887	2, quarto.
1888	2	1888	2, quarto.
1889	2	1889	3, quarto.
1890	2	1890	3, quarto.
1891	Table 2	1891	3, quarto.
1892	2	1892	3, quarto.
1893	2	1893	3, quarto.
1894	2	1894	3, quarto.
1895	2	1895	3, quarto.
1896	2	1896	3, quarto.

IIIc. OFFICIAL REPORTS OF EXPENDITURES AND OF PERSONS EMPLOYED.

U. S. COAST AND GEODETIC SURVEY.

Year of publication.	Title.	Number of pages and size.	How printed or published.
1842	Report by the Secretary of the Treasury of the expenditures for the survey of the United States coast. January 25, 1842.	8, octavo.	Twenty-seventh Congress, second session. House Doc. No. 57—Vol. II.
1843	Report of select committee on the result of an examination of the progress and expenditure of the Coast Survey. January, 1843.	103, octavo.	Twenty-seventh Congress, third session. House Report No. 43.
1843	Report of select committee. Additional information to that communicated in January by the same committee upon the progress and expenditures of the Coast Survey. February, 1843.	93, octavo.	Twenty-seventh Congress, third session. House Report No. 170.
1848	Report by the Secretary of the Treasury on appropriations for the Coast Survey. December 22, 1848.	2, octavo.	Thirtieth Congress, second session. Senate Ex. Doc. No. 4.
1849	Report of Secretary of the Treasury regarding Coast Survey expenditures and results. February 7, 1849.	111, octavo.	Thirtieth Congress, second session. Senate Ex. Doc. No. 26—Vol. III.
1849	Report of Secretary of the Treasury of number and cost of vessels and number of men employed in survey of United States coast. February 9, 1849.	9, octavo.	Thirtieth Congress, second session. Senate Ex. Doc. No. 29—Vol. III.
1853	Secretary of the Treasury submits report of Superintendent of Coast Survey showing number and names of persons employed in Coast Survey during year ending June 30, 1853, their commensation and service, with expenditures made under his direction. December 25, 1853.	16, octavo.	Thirty-third Congress, first session. Senate Doc. No. 11—Vol. IV.
1854	Secretary of the Treasury transmits reports showing disbursements in behalf of the Coast Survey. December 27, 1854.	10, octavo.	Thirty-third Congress, second session. House. Ex. Doc. No. 23—Vol. V.
1856	Letter of Secretary of the Treasury transmitting report of number and names of persons employed in the Coast Survey and expenditures made during the year 1854–55. December 22, 1856.	12, octavo.	Thirty-fourth Congress, first session. House Ex. Doc. No. 44—Vol. IX.
1858	Secretary of the Treasury transmits list of persons employed in Coast Survey and expenditures for year ending June 30, 1857. January 15, 1858.	12, octavo.	Thirty-fifth Congress, first session. House Ex. Doc. No. 20—Vol. III.
1858	Secretary of the Treasury reports amount expended and progress made in the Coast Survey, and also the standard weights and measures furnished the several States and custom-houses, and their cost. December 16, 1858.	287, octavo.	Thirty-fifth Congress, second session. Senate Report No. 6—Part 2, Vol. VI.
1859	Report by Secretary of the Treasury of names and salaries of persons employed on the Coast Survey. January 7, 1859.	13, octavo.	Thirty-fifth Congress, second session. House Ex. Doc. No. 29—Vol. V.
1860	Report by Secretary of the Treasury transmitting list of the number and names of persons employed on the Coast Survey, amount of compensation, etc. December 24, 1860.	10, octavo.	Thirty-sixth Congress, second session. Ex. Doc. No. 15—Vol. VI.
1862	Report by Secretary of the Treasury of expenditures on account of the Coast Survey for the year ending June 30, 1861, list of persons employed, salaries, etc. March 6, 1862.	79, octavo.	Thirty-seventh Congress, second session. House Ex. Doc. No. 68—Vol. V.
1862	Report by Secretary of the Treasury transmitting list of the number and names of persons employed in the Coast Survey and expenditures during the year ending June 30, 1861. March 25, 1862.	11, octavo.	Thirty-seventh Congress, second session. House Ex. Doc. No. 83—Vol. VII.

IIIc. OFFICIAL REPORTS OF EXPENDITURES AND OF PERSONS EMPLOYED—Continued.

U. S. COAST AND GEODETIC SURVEY—Continued.

Year of publication.	Title.	Number of pages and size.	How printed or published.
1863	Report by Secretary of the Treasury transmitting statement showing number and names of persons employed in the Coast Survey during the fiscal year ending June 30, 1863, amount of their compensation, and time of employment, with a statement of all expenditures made during the year. December 16, 1863.	11, octavo.	Thirty-eighth Congress, first session. House Ex. Doc. No. 13—Vol. VII.
1864	Report of Secretary of the Treasury transmitting list of employés, with compensations and statement of expenditures of Coast Survey for fiscal year ending June 30, 1864. December 21, 1864.	9, octavo.	Thirty-eighth Congress, second session. House Ex. Doc. No. 13, Vol. VIII.
1866	Report of Secretary of Treasury transmitting a statement of employés in the Coast Survey during the year ending June 30, 1865.	9, octavo.	Thirty-ninth Congress, first session. House Ex. Doc. No. 24, Vol. VII.
1866	Report by Secretary of the Treasury transmitting list of employés of Coast Survey with compensations, etc., for the fiscal year ending June 30, 1866. December 15, 1866.	10, octavo.	Thirty-ninth Congress, second session. House Ex. Doc. No. 15, Vol. VI.
1868	Report by Secretary of the Treasury on expenses of the Coast Survey for the year ending June 30, 1867. May 8, 1868.	9, octavo.	Fortieth Congress, second session. House Ex. Doc. No. 286, Vol. XVII.
1870	Report by Secretary of the Treasury transmitting list of employés, with compensations, and statement of expenditures of Coast Survey for fiscal year ending June 30, 1869. January 22, 1870.	8, octavo.	Forty-first Congress, second session. House Ex. Doc. No. 75, Vol. VI.
1871	Report by Secretary of the Treasury transmitting list of employés of the Coast Survey, with compensations, during fiscal year ending June 30, 1870. February 25, 1871.	9, octavo.	Forty-first Congress, third session. House Ex. Doc. No. 142, Vol. XII.
1874	Report of Secretary of the Treasury transmitting list of Coast Survey employés for year ending June 30, 1874. December 23, 1874.	8, octavo.	Forty-third Congress, second session. House Ex. Doc. No. 71, Vol. XII.
1879	Report by Secretary of the Treasury of expenditures on account of the Coast Survey for the fiscal year ending June 30, 1878. January 28, 1879.	7, octavo.	Forty-fifth Congress, third session. House Ex. Doc. No. 40, Vol. XVI.
1880	Report by Secretary of the Treasury transmitting a report of expenditures of the Coast and Geodetic Survey for the year ending June 30, 1879. March 26, 1880.	7, octavo.	Forty-sixth Congress, second session. House Ex. Doc. No. 68, Vol. XXIV.
1881	Report by Secretary of the Treasury transmitting a report of the expenditures of the Coast and Geodetic Survey for the year ending June 30, 1880. January 31, 1881.	7, octavo.	Forty-sixth Congress, third session. House Ex. Doc. No. 64, Vol. XVIII.
1882	Brief report of the Superintendent of the Coast and Geodetic Survey, containing statement of expenditures for the fiscal year ending with June 30, 1882. December 2, 1882.	18, octavo.	Treasury Department. Doc. No. 364.
1884	Letter from Secretary of the Treasury transmitting statement of expenditures of Coast and Geodetic Survey for the fiscal year ending June 30, 1883. January 22, 1884.	8, octavo.	Forty-eighth Congress, first session. House Ex. Doc. No. 63.
1884	Letter from Secretary of the Treasury transmitting statement of expenditures of Coast and Geodetic Survey for the fiscal year ending June 30, 1884. December 18, 1884.	8, octavo.	Forty-eighth Congress, second session. House Ex. Doc. No. 52.
1886	Letter from Secretary of the Treasury transmitting statement of expenditures of the Coast and Geodetic Survey for the fiscal year ending June 30, 1885. January 9, 1886.	30, octavo.	Forty-ninth Congress, first session. House Ex. Doc. No. 32.

IIIc. OFFICIAL REPORTS OF EXPENDITURES AND OF PERSONS EMPLOYED—Continued.

U. S. COAST AND GEODETIC SURVEY—Continued.

Year of publication.	Title.	Number of pages and size.	How printed or published.
1887	Letter from Secretary of the Treasury transmitting statement of expenditures of Coast and Geodetic Survey for fiscal year ending June 30, 1886. February 4, 1887.	27, octavo.	Forty-ninth Congress, second session. House Ex. Doc. No. 149.
1888	Letter from Secretary of the Treasury transmitting statement of expenditures of Coast and Geodetic Survey for fiscal year ending June 30, 1887. February 11, 1888.	29, octavo.	Fiftieth Congress, first session. House Ex. Doc. No. 154.
1889	Letter from Secretary of the Treasury transmitting statement of expenditures of Coast and Geodetic Survey for fiscal year ending June 30, 1888. January 2, 1889.	30, octavo.	Fiftieth Congress, second session. House Ex. Doc. No. 53.
1890	Letter from Secretary of the Treasury transmitting statement of expenditures of Coast and Geodetic Survey for fiscal year ending June 30, 1889. January 2, 1890.	31, octavo.	Fifty-first Congress, first session. House Ex. Doc. No. 90.
1891	Letter from Secretary of the Treasury transmitting statement of expenditures of Coast and Geodetic Survey for fiscal year ending June 30, 1890. February 26, 1891.	28, octavo.	Fifty-first Congress, second session. House Ex. Doc. No. 278.
1892	Letter from the Secretary of the Treasury transmitting statement of expenditures on account of the U. S. Coast and Geodetic Survey for the fiscal year ending June 30, 1891. March 1, 1892.	28, octavo.	Fifty-second Congress, first session. House Ex. Doc. No. 151. Also published as Office Report No. 3, Annual Report, 1891.
1893	Letter from the Secretary of the Treasury transmitting statement of expenditures on account of the U. S. Coast and Geodetic Survey for the year ending June 30, 1892. March 1, 1893.	27, octavo.	Fifty-second Congress, second session. House Ex. Doc. No. 253. Also published as Office Report No. 3, Annual Report, 1892.
1894	Letter from the Secretary of the Treasury transmitting a statement of expenditures made on account of the U. S. Coast and Geodetic Survey for the fiscal year ending June 30, 1893. March 22, 1894.	23, octavo.	Fifty-third Congress, second session. House Ex. Doc. No. 157. Also published as Office Report No. 3, Annual Report of 1893.
1895	Letter from the Secretary of the Treasury transmitting a detailed statement of the expenditures of the Coast and Geodetic Survey for the fiscal year ending June 30, 1894. February 18, 1895.	22, octavo.	Fifty-third Congress, third session. House Ex. Doc. No. 324. Also published as Office Report No. 3, Annual Report, 1894.
1896	Letter from the Secretary of the Treasury transmitting a statement of expenditures on account of the Coast and Geodetic Survey for the fiscal year ended June 30, 1895. June 5, 1896.	21, octavo.	Fifty-fourth Congress, first session. House Ex. Doc. No. 402. Also published as Office Report No. 3, Annual Report, 1895.
1897	Letter from the Acting Secretary of the Treasury transmitting a statement of expenditures on account of the Coast and Geodetic Survey for the fiscal year ended June 30, 1896. January 4, 1897.	20, octavo.	Fifty-fourth Congress, second session. House Ex. Doc. No. 155. Also published as Office Report No. 3, Annual Report, 1896.

III*d*. TABULAR STATEMENTS OF INFORMATION FURNISHED.

U. S. COAST AND GEODETIC SURVEY.

Tabular statements of information furnished by the Survey in response to official calls, or in compliance with unofficial requests, under the regulations of the Treasury Department, will be found in the annual reports, as follows:

Year of report.	No. of appendix or table.	Pages.	Year of report.	No. of appendix or table.	Pages.	Year of report.	No. of appendix or table.	Pages.	Year of report.	No. of appendix or table.	Pages.
1852	7	83, 84	1864	2	44–46	1875	3	81, 82	1886	3	107–113
1853	6	12, 13	1865	2	41, 4	1876	3	75, 76	1887	3	105–111
1854	5	11, 12	1866	2	32	1877	3	78, 79	1888	3	107–111
1855	5	115, 116	1867	2	52	1878	3	75, 76	1889	3	115–119
1856	5	104–106	1868	2	47	1879	3	85–87	1890	3	119–125
1857	5	135, 136	1869	2	71	1880	3	70–72	1891	3	111–116
1858	6	134, 135	1870	2	59–62	1881	3	75–80	1892	3	117–123
1859	6	118, 119	1871	2	78, 79	1882	3	79–84	1893	3	95–102
1860	6	117	1872	3	63, 64	1883	3	87–92	1894	3	87–91
1861	4	85, 86	1873	3	76, 77	1884	3	97–102	1895	3	81–89
1862	2	74, 75	1874	3	57, 58	1885	3	89–93	1896	3	69–76
1863	2	67–69									

III*e*. ANNUAL REPORTS OF OFFICE OPERATIONS.

U. S. COAST AND GEODETIC SURVEY.

In the earlier Reports of the Coast Survey statements of progress made in office operations will generally be found following the abstracts of reports of field work, attention being called also to office work of special interest or importance in the introductory portions of the Reports.

This will be found to apply to the Annual Reports from 1844 to 1855, inclusive.

In the Reports from 1856 to 1864, inclusive, in addition to the notices of office operations in the body of each Report, there are Appendices which contain reports from the Chiefs of the Divisions of the Office, or, in some cases, the complete reports of the Assistant in charge of the Office, and of the Chiefs of Divisions. (See List of Contents of Appendices preceding Alphabetical Index.)

The publication of the annual reports of the Assistant in charge of the Office, and of the Chiefs of the Office Divisions, was discontinued during the years 1865 to 1880, inclusive, and the references to office operations were made in the same manner as those in the Annual Reports of the Survey from 1844 to 1855, inclusive, these references being supplemented by Appendices giving lists of drawings or engravings of charts in progress or completed, and by Appendices detailing the field and office work relating to tides.

In the Annual Report for 1881 the reports made by the Chiefs of the Computing, Tidal, Drawing, Engraving, and Hydrographic Divisions of the Office were printed in full; in the Report for 1882 these reports were published as Appendix No. 6; in the Annual Reports of the

Survey from 1883 to 1889, inclusive, the annual reports of the Assistant in charge of Office and Topography, and of the Hydrographic Inspector, appear as Appendices Nos. 4 and 5; in the Annual Report for 1890, Appendix No. 4 contains the annual report of the Assistant in charge of the Office; Appendix No. 5 the annual report of the Hydrographic Inspector: Appendix No. 6 the annual report of the Disbursing Agent, and Appendix No. 7 the annual report of the Assistant in charge of the Office of Weights and Measures.

It has not been deemed advisable to add to the bulk of this Descriptive Catalogue by extended lists of these Office reports, embodying as they do much matter relating to routine operations and details of value chiefly for official reference.

III*f*. NECROLOGY. 1844 TO 1890.

U S. COAST AND GEODETIC SURVEY.

Under III*f* will be found in alphabetical order the names of those officers and employés of the Survey who have died in its service, and with regard to whom memorial meetings were held or obituary notices issued.

Name and grade.	Reference to in Annual Report, or date of obituary notice.	Pages.
Allison, Richard, Passed Midshipman and Acting Master, U. S. N	1847	45, 81, 82.
Bache, Alexander Dallas, Superintendent, 1844–1867	1867	330–334.
Bache, Charles M., Assistant	Apr. 21, 1890	
Bache, George M., Lieutenant, U. S. N., Assistant, U. S. Coast Survey	1846	23, 62, 68.
Bache, Henry Wood, Subassistant	1879	10, 11.
Baker, Woods, Assistant	1852	5, 67, 132.
Barker, John R., Draughtsman and Artist	1884	16.
Barnard, Henry S., Engraver	1875	10.
Bassett, R. T	1894	103.
Bissell, George W., Hydrographic Aid	1871	15.
Blair, Henry Wayne, Assistant	1885	73, 76, 97, 98, 113.
Blunt, Edmund, Assistant	1866	8.
Boutelle, Charles Otis, Assistant	1890	84.
	June 25, 1890	
Cordell, Edward, Assistant	1870	8, 9.
Crosby, F. H., Lieutenant, U. S. N., Assistant	1895	43, 125.
Cutts, Richard D., Assistant	Dec. 15, 1883	
In charge of the Office	1884	14, 15.
Dankworth, F., Engraver	1859	32.
De Koven, William, Passed Midshipman, U. S. N	1851	533.
Dickins, Hugo L., Assistant	1844	18.
Diggs, John H., Messenger	1871	15, 16.
Dorr, Frederick William, Assistant	Dec. 24, 1877	
Drinkard, C. L., Clerk	1881	55, 56, 64.
Duer, John K., Lieutenant, U. S. N., Assistant, U. S. Coast Survey	1859	32.
Fairfax, Wilson M. C., Assistant	1860	30.
Farley, John, Assistant	1874	16.
	Aug. 3, 1874	
Farquhar, George, Hydrographic Draughtsman	1880	40.
Fauntleroy, E. H., Aid	1860	31.
Fauntleroy, R. H., Assistant	1850	47, 116, 117.
Fendall, Clarence, Subassistant	1868	8.
Foster, James, Passed Midshipman, U. S. N	1847	17.
Gerdes, Ferdinand H., Assistant	1884	15, 16.
Gilbert, Samuel A., Assistant	1868	7, 8.
Gilbert, Wyllys S., Subassistant	1862	19.
Gluck, John B., Assistant	1852	5, 28, 131.

III*f*. NECROLOGY—Continued.

U. S. COAST AND GEODETIC SURVEY—Continued.

Name and grade.	Reference to in Annual Report, or date of obituary notice.	Pages.
Harding, William W., Subassistant	1871	15.
Harrison, A. M., Assistant	1881	9.
	Feb. 2, 1881	
Hassler, J. J. S., Assistant	1858	42.
Hein, Samuel, Disbursing Agent, 1844-1877; Librarian, 1877-1885	1886	118.
Hein, Harry S., Clerk	1871	15.
Hergesheimer, Edwin, Assistant, and Chief of the Drawing Division, U. S. Coast and Geodetic Survey Office	1889	96, 123.
Hering, M. O., Aid	1861	23.
Hoover, John T., Chief of the Miscellaneous Division, U. S. Coast and Geodetic Survey Office	1878	10, 63.
Hough, S. J., Aid	1857	83.
Hosmer, Charles, Assistant	1888	22.
Humphries, G. E., Aid	1857	43.
Hunt, E. B., Maj., U. S. Engineers, Assistant	1863	17, 18.
Hutchinson, Henry T, Sailing Master	1879	42.
Johnstone, M. T., in charge of Map Room	1866	9.
Junken, Chas., Civil Expert	1893	77.
Karcher, Louis, Draughtsman	1886	118.
Kincheloe, Julius, Subassistant	1867	11.
Knight, John, Engraver	1875	10.
Kondrup, John C., Engraver	1875	10.
Lawson, James S, Assistant	1894	75.
Mapes, W. B., Acting Aid	1886	57.
Mapes, W. H., Inspecting Engineer	1879	12.
McArthur, Wm. P., Lieut., U. S. N., Assistant, Coast Survey	1851	82, 509-511.
McClery, M. J., Draughtsman	1866	8, 9.
McCoy, Hazzard, Mail Messenger	1886	118.
McCorkle, Spencer C., Assistant	Mar. 21, 1894	2 octavo.
	1894	75.
McDonnell, Thomas, in charge of Map Room	1882	15.
Nes, Frederick F., Assistant	July 8, 1879	
Oltmanns, John G., Assistant	1870	9.
O'Sullivan, T. J., Draughtsman, in charge of Drawing Division	1886	118.
Over, Frank, Assistant Electrotypist	1886	118.
Palmer, William R., Maj., U. S. Topographical Engineers, Assistant in charge of the Coast Survey Office 1858 to 1862	1862	19, 431, 432.
Patterson, Carlile P., Superintendent, 1874-1881	Aug. 17, 1881	22.
	1882	14, 15, 559-563.
Patterson, W. P., Watchman	1868	8.
Pearl, Arthur F., Hydrographic Aid	1871	15.
Peirce, Benjamin, Superintendent, 1867-1874	Oct. 11, 1980	
Consulting Geometer, 1874-1880	1881	8, 9.
Pleasants, W. H., Engineer	1879	44.
Rumpf, Gottlieb, Computer	1882	63, 95.
Ruth, Joseph S., Assistant	1852	6, 51, 52, 132, 133.
Sands, William F., Hydrographic Aid	1862	20.
Seib, John, Assistant	1860	30.
Sengteller, A., Engraver	1884	16.
Sengteller, Louis A., Assistant	1889	70.
Smead, John R., Capt., Fifth U. S. Artillery	1862	19, 434.

III *f*. NECROLOGY—Continued.

U. S. COAST AND GEODETIC SURVEY—Continued.

Name and grade.	Reference to in Annual Report, or date of obituary notice.	Pages.
Stevens, Isaac I., Brig. Gen., U. S. Volunteers, Assistant in charge of the Coast Survey Office, 1849 to 1853	1862	19, 432, 433.
Stewart, Gordon A., Keeper of Archives	1882	16.
Taney, Edmund L., Subassistant	May 10, 1890	
Terrill, William R., Brig. Gen., U. S. Volunteers	1862	19.
Terry, Carlisle, jr., Subassistant	1887	62.
	Mar. 14, 1887	
Thompson, A. W., Aid	1861	23.
Throop, J. V. N., Engraver	1860	30.
Totten, Joseph Swift, Lieut., U. S. Artillery, Assistant	1853	15, 167, 168.
Turner, J. H., Assistant	June 13, 1894	2, octavo.
	1893	77.
Wadsworth, Alexander S., Assistant	1862	19.
Walker, Sears C., Assistant	1853	15, 166, 167.
Waters, Richard, Fireman	1886	118.
West, Benjamin F., Subassistant	1853	15, 168, 169.
Wharton, Edward, Engraving Division	1868	8.
Whyte, Joseph, Clerk	1858	42.
Willenbucher, E., Draughtsman	1873	77.
Winlock, Joseph, Director of Harvard College Observatory and Astronomer for the Coast Survey	1875	10.
Würdemann, Gustavus, Tidal Observer	1859	32.
Yeatman, A., Master Carpenter	1884	16.

IV.

LIST OF TIDE TABLES FROM THE DATE OF EARLIEST PUBLICATION IN THE SURVEY TO THE YEAR 1896.

U. S. COAST AND GEODETIC SURVEY.

Year of publication.	Description.	Number of pages and size.	Mode of publication.
1854	Tide tables for the United States; prepared from the Coast Survey observations by A. D. Bache, Superintendent.	4, quarto.	Appendix No. 26, Report for 1853.
1855	Tide tables for the coast of the United States.	10, quarto.	Appendix No. 51, Report for 1854.
1856	Tide tables for the use of navigators; prepared from the Coast Survey observations by A. D. Bache, Superintendent.	12, quarto.	Appendix No. 53, Report for 1855.
1856	.....do	14, quarto.	Appendix No. 17, Report for 1856.
1858	.....do	21, quarto.	Appendix No. 20, Report for 1857.
1859	.....do	22, quarto.	Appendix No. 43, Report for 1858.
1860	.....do	32, quarto.	Appendix No. 14, Report for 1859.
1861	.....do	34, quarto.	Appendix No. 16, Report for 1860.
1862	.....do	34, quarto.	Appendix No. 9, Report for 1861.
1864	.....do	34, quarto.	Appendix No. 8, Report for 1862.
1864	.....do	34, quarto.	Appendix No. 12, Report for 1863.
1866	.....do	33, quarto.	Appendix No. 8, Report for 1864.
1866	Tide tables for the Atlantic coast of the United States for the year 1867.	101, 12mo.	Pamphlet [Government Printing Office].
1866	Tide tables for the Pacific coast of the United States for the year 1867.	32, 12mo.	Do.
1867	Tide tables for the Atlantic coast of the United States for the year 1868.	109, 12mo.	Do.
1867	Tide tables for the Pacific coast of the United States for the year 1868.	58, 12mo.	Do.
1868	Tide tables for the Atlantic coast of the United States for the year 1869.	110, 12mo.	Do.
1868	Tide tables for the Pacific coast of the United States for the year 1869.	58, 12mo.	Do.
1869	Tide tables for the Atlantic coast of the United States for the year 1870.	111, 12mo.	Do.
1869	Tide tables for the Pacific coast of the United States for the year 1870.	59, 12mo.	Do.
1870	Tide tables for the Atlantic coast of the United States for the year 1871.	112, 12mo.	Do.
1870	Tide tables for the Pacific coast of the United States for the year 1871.	59, 12mo.	Do.
1871	Tide tables for the Atlantic coast of the United States for the year 1872.	119, 12mo.	Do.
1871	Tide tables for the Pacific coast of the United States for the year 1872.	59, 12mo.	Do.
1872	Tide tables for the Atlantic coast of the United States for the year 1873.	121, 12mo.	Do.
1872	Tide tables for the Pacific coast of the United States for the year 1873.	60, 12mo.	Do.
1873	Tide tables for the Atlantic coast of the United States for the year 1874.	122, 12mo.	Do.
1873	Tide tables for the Pacific coast of the United States for the year 1874.	60, 12mo.	Do.
1874	Tide tables for the Atlantic coast of the United States for the year 1875.	122, 12mo.	Do.

LIST OF TIDE TABLES, ETC.—Continued.

Year of publication.	Description.	Number of pages and size.	Mode of publication.
1874	Tide tables for the Pacific coast of the United States for the year 1875.	61, 12mo.	Pamphlet [Government Printing Office].
1875	Tide tables for the Atlantic coast of the United States for the year 1876.	109, 12mo.	Do.
1875	Tide tables for the Pacific coast of the United States for the year 1876.	61, 12mo.	Do.
1876	Tide tables for the Atlantic coast of the United States for the year 1877.	124, 12mo.	Do.
1876	Tide tables for the Pacific coast of the United States for the year 1877.	61, 12mo.	Do.
1877	Tide tables for the Atlantic coast of the United States for the year 1878.	124, 12mo.	Do.
1877	Tide tables for the Pacific coast of the United States for the year 1878.	61, 12mo.	Do.
1878	Tide tables for the Atlantic coast of the United States for the year 1879.	128, 12mo.	Do.
1878	Tide tables for the Pacific coast of the United States for the year 1879.	65, 12mo.	Do.
1879	Tide tables for the Atlantic coast of the United States for the year 1880.	129, 12mo.	Do.
1879	Tide tables for the Pacific coast of the United States for the year 1880.	65, 12mo.	Do.
1880	Tide tables for the Atlantic coast of the United States for the year 1881.	129, 12mo.	Do.
1880	Tide tables for the Pacific coast of the United States for the year 1881.	65, 12mo.	Do.
1881	Tide tables for the Atlantic coast of the United States for the year 1882.	130, 12mo.	Do.
1881	Tide tables for the Pacific coast of the United States for the year 1882.	65, 12mo.	Do.
1882	Tide tables for the Atlantic coast of the United States for the year 1883.	130, 12mo.	Do.
1882	Tide tables for the Pacific coast of the United States for the year 1883.	66, 12mo.	Do.
1883	Tide tables for the Atlantic coast of the United States for the year 1884.	136, 12mo.	Do.
1883	Tide tables for the Pacific coast of the United States for the year 1884.	66, 12mo.	Do.
1884	Tide tables for the Atlantic coast of the United States for the year 1885.	136, 12mo.	Do.
1884	Tide tables for the Pacific coast of the United States for the year 1885.	66, 12mo.	Do.
1885	Tide tables for the Atlantic coast of the United States for the year 1886.	157, 12mo.	Do.
1885	Tide tables for the Pacific coast of the United States, together with a few stations in Lower California, British Columbia, and Alaska Territory, for the year 1886.	75, 12mo.	Do.
1886	Tide tables for the Atlantic coast of the United States for the year 1887.	241, 12mo.	Do.
1886	Tide tables for the Pacific coast of the United States, together with a few stations in Lower California, British Columbia, and Alaska Territory, for the year 1887.	75, 12mo.	Do.
1887	Tide tables for the Atlantic coast of the United States for the year 1888.	242, 12mo.	Do.
1887	Tide tables for the Pacific coast of the United States, together with a few stations in Lower California, British Columbia, and Alaska Territory, for the year 1888.	80, 12mo.	Do.
1888	Tide tables for the Atlantic coast of the United States for the year 1889.	242, 12mo.	Do.

LIST OF TIDE TABLES—Continued.

Year of publication.	Description.	Number of pages and size.	Mode of publication.
1888	Tide tables for the Pacific coast of the United States, together with a few stations in Lower California, British Columbia, and Alaska Territory, for the year 1889.	79, 12mo.	Pamphlet [Government Printing Office].
1889	Tide tables for the Atlantic coast of the United States, together with 206 stations on the Atlantic coast of British America, for the year 1890.	237, large octavo.	Do.
1889	Tide tables for the Pacific coast of the United States, together with 121 stations in Lower California, British Columbia, and Alaska Territory, for the year 1890.	105, large octavo.	Do.
1890	Tide tables for the Atlantic coast of the United States, together with 206 stations on the Atlantic coast of British America, for the year 1891.	250, large octavo.	Do.
1890	Tide tables for the Pacific coast of the United States, together with 121 stations in Lower California, British Columbia, and Alaska Territory, for the year 1891.	111, large octavo.	Do.
1891	Tide tables for the Atlantic coast of the United States, together with 206 stations on the Atlantic coast of British America, for the year 1892.	250, quarto.	Do.
1891	Tide tables for the Pacific coast of the United States, with 132 stations in Lower California, British Columbia, and Alaska, for the year 1892.	221, small octavo.	Do.
1892	Tide tables for the Atlantic coast of the United States, together with 206 stations on the Atlantic coast of British America, for the year 1893.	253, small quarto.	Do.
1892	Tide tables for the Pacific coast of the United States, together with 150 stations in Lower California, British Columbia, and Alaska, for the year 1893.	221, small octavo.	Do.
1893	Tide tables for the Atlantic coast of the United States, together with 207 stations in British America, for the year 1894.	253, small quarto.	Do.
1893	Tide tables for the Pacific coast of the United States, together with 150 stations in Lower California, British Columbia, and Alaska, for the year 1894.	221, small quarto.	Do.
1893	Tide tables for the Atlantic coast of the United States, together with 207 stations in British America, for 1895.	257, small quarto.	Do.
1894	Tide tables for the Pacific coast of America, together with stations in Asia, Australia, and islands in the Pacific Ocean, for the year 1895.	308, small quarto.	Do.
1895	Tide tables for the year 1896, by the U. S. Coast and Geodetic Survey.	458, small quarto.	Do.
1895	Tide tables for the Pacific coast of the United States (reprint from Tide Tables for 1896), by U. S. Coast and Geodetic Survey, W. W. Duffield, superintendent.	28, quarto.	Do.
1896	Tide tables for the year 1897, by the U. S. Coast and Geodetic Survey, W. W. Duffield, superintendent.	458, small quarto.	Do.
1896	Tide tables for the Pacific coast of the United States (reprinted from Tide Tables for 1897), by the U. S. Coast and Geodetic Survey.	42, small quarto.	Do.

V.

CATALOGUE OF COAST PILOTS FOR THE ATLANTIC AND PACIFIC COASTS OF THE UNITED STATES FROM THE DATE OF EARLIEST PUBLICATION BY THE COAST SURVEY TO THE YEAR 1896.

U. S. COAST AND GEODETIC SURVEY.

Year of publication.	Title.	Number of pages and size.	Number of charts, views, etc.	Mode of publication.
1850	Sailing directions to accompany the new chart of the western coast of the United States. (First edition.) Published December, 1850. By A. D. Bache, Superintendent.	13, octavo.	.....	Gideon & Co., Printers, Washington, D. C.
1851	Notices of the western coast of the United States. U. S. Coast Survey, A. D. Bache, Superintendent. (Revised edition.) December, 1851.	55, octavo.	.....	Do.
1856	Extracts from a report made to the Superintendent by Assistant George Davidson, upon localities on the western coast of the United States from the north entrance of Rosario Strait, Washington Territory, to the southern boundary of California.	10, quarto.	.....	Report for 1855—Appendix 26.
1856	Extracts from letters addressed to the Superintendent by Lieut. W. P. Trowbridge, U. S. Engineers, Assistant, relative to Bodega Bay and South Farallon Island, California.	2, quarto.	.....	Report for 1855—Appendix 27.
1856	Extracts from the report of Sub-assistant W. M. Johnson relative to the features of Santa Cruz Island, the valley of San Buenaventura, and the coast of Santa Barbara Channel.	3, quarto.	.....	Report for 1855—Appendix 28.
1856	Letter of Commander James Alden, U. S. Navy, Assistant, relative to the coast, harbors, and commerce of Washington Territory.	4, quarto.	.....	Report for 1855—Appendix 29.
1856	Catalogue of sailing directions, list of dangers, etc., prepared for publication under the direction of the Superintendent.	8, quarto.	.....	Report for 1855—Appendix 30.
1856	Report upon the sailing directions for the port of New York and its approaches, taken from the general chart of the Coast Survey, published in 1852, by A. D. Bache, Superintendent U. S. Coast Survey, together with a copy of the sailing directions themselves.	31, octavo.	.....	Cambridge. Printed by Allen & Farnham, 1856, for gratuitous distribution by the Life Saving Benevolent Association of New York.
1859	Directory for the Pacific Coast of the United States, reported to the Superintendent of the United States Coast Survey by George Davidson, Assistant. (First edition.)	162, quarto.	.....	Coast Survey report, 1858—Appendix 44.
1864	The same. (Second edition.)	163, quarto.	.....	Coast Survey report, 1862—Appendix 39.
1869	Report of Assistant George Davidson, relative to the resources and the coast features of Alaska Territory. NOTE.—This report, which is the basis of the Coast Pilot of Alaska, published in the same year as a separate volume, was first submitted for publication by Mr. Davidson on November 30, 1867.	143, quarto.	4	Coast Survey report, 1867—Appendix 18.

CATALOGUE OF COAST PILOTS FOR THE ATLANTIC AND PACIFIC COASTS, ETC.—Continued.

Year of publication.	Title.	Number of pages and size.	Number of charts, views, etc.	Mode of publication.
1869	Pacific Coast. Coast Pilot of California, Oregon, and Washington Territory. By George Davidson, Assistant, Coast Survey.	262, quarto.	33	1 vol., Government Printing Office, 1869.
1869	Pacific Coast. Coast Pilot of Alaska. (First part.) From southern boundary to Cook's Inlet. By George Davidson, Assistant, Coast Survey.	251, quarto.	8	1 vol., Government Printing Office, 1869.
1875	Coast Pilot for the Atlantic sea-board. Gulf of Maine and its coast from Eastport to Boston. 1874. By J. S. Bradford, Assistant.	960, quarto.	12	1 vol., Government Printing Office, 1875.
1878	Atlantic Coast Pilot. Boston Bay to New York.	628, quarto.	55	1 vol., Government Printing Office, 1878.
1879	Atlantic Coast Pilot. Boston Bay to Monomoy.	92, quarto.	4	1 vol., Government Printing Office, 1879.
1879	Atlantic Coast Pilot. Nantucket and Vineyard Sounds.	107, quarto.	7	1 vol., Government Printing Office, 1879.
1879	Atlantic Coast Pilot. Buzzard's and Narragansett Bays.	122, quarto.	4	1 vol., Government Printing Office, 1879.
1879	Atlantic Coast Pilot. Block Island and Fisher's Island Sounds, Gardiner's and Peconic Bays.	66, quarto.	4	1 vol., Government Printing Office, 1879.
1879	Atlantic Coast Pilot. Long Island Sound and East River.	86, quarto.	6	1 vol., Government Printing Office, 1879.
1879	Atlantic Coast Pilot. Harbors in Long Island Sound.	112, quarto.	4	1 vol., Government Printing Office, 1879.
1879	Atlantic Coast Pilot. South coast of Long Island, New York Bay, and Hudson River.	90, quarto.	22	1 vol., Government Printing Office, 1879.
	NOTE.—The seven volumes above named, published early in the year 1879, comprise a series intended to meet local wants, and are all contained in the one volume of the Atlantic Coast Pilot for 1878, compiled and verified by J. S. Bradford, Assistant.			
1879	Atlantic Coast Pilot. Division A. Eastport to Boston. (Second edition.)	694, quarto.	56	1 vol., Government Printing Office, 1879.
1879	Atlantic Local Coast Pilot. Subdivision 1. Passamaquoddy Bay to Schoodic.	115, quarto.	10	1 vol., Government Printing Office, 1879.
1879	Atlantic Local Coast Pilot. Subdivision 2. Frenchmans Bay to Isle-au-haut.	196, quarto.	7	1 vol., Government Printing Office, 1879.
1879	Atlantic Local Coast Pilot. Subdivision 3. Penobscot Bay and tributaries. (First edition.)	121, quarto.	18	1 vol., Government Printing Office, 1879.
1879	Atlantic Local Coast Pilot. Subdivision 4. White Head Island to Cape Small Point.	126, quarto.	6	1 vol., Government Printing Office, 1879.
1879	Atlantic Local Coast Pilot. Subdivision 5. Cape Small Point to Cape Ann.	141, quarto.	10	1 vol., Government Printing Office, 1879.

CATALOGUE OF COAST PILOTS FOR THE ATLANTIC AND PACIFIC COASTS, ETC.—Continued.

Year of publication.	Title.	Number of pages and size.	Number of charts, views, etc.	Mode of publication.
1879	Atlantic Local Coast Pilot. Subdivision 6. Cape Ann to Cohasset.	107, quarto.	5	1 vol., Government Printing Office, 1879.
	NOTE.—The six volumes of the Atlantic Local Coast Pilot named above and published about the middle of the year 1879, appear as separate parts of the large volume "Atlantic Coast Pilot, Division A, Eastport to Boston" (second edition), compiled by J. S. Bradford, Assistant.			
1879	Pacific Coast Pilot. Coast and islands of Alaska. Second series. Appendix 1. Meteorology and Bibliography. By W. H. Dall, Assistant.	375, quarto.	27	1 vol., Government Printing Office, 1879.
1880	Atlantic Coast Pilot. Division B. Boston to New York. (Second edition.)	675, quarto.	53	1 vol., Government Printing Office, 1880.
1880	Atlantic Local Coast Pilot. Subdivision 7. Boston to Monomoy. (Second edition.)	86, quarto.	5	1 vol., Government Printing Office, 1880.
1880	Atlantic Local Coast Pilot. Subdivision 8. Nantucket and Vineyard sounds. (Second edition.)	116, quarto.	9	1 vol., Government Printing Office, 1880.
1880	Atlantic Local Coast Pilot. Subdivision 9. Buzzards and Narragansett bays. (Second edition.)	131, quarto.	5	1 vol., Government Printing Office, 1880.
1880	Atlantic Local Coast Pilot. Subdivision 10. Block Island and Fisher's Island sounds; Gardiner's and Peconic bays. (Second edition.)	70, quarto.	5	1 vol., Government Printing Office, 1880.
1880	Atlantic Local Coast Pilot. Subdivision 11. Long Island Sound and East River. (Second edition.)	92, quarto.	6	1 vol., Government Printing Office, 1880.
1880	Atlantic Local Coast Pilot. Subdivision 12. Harbors in Long Island Sound. (Second edition.)	126, quarto.	4	1 vol., Government Printing Office, 1880.
1880	Atlantic Local Coast Pilot. Subdivision 13. South coast of Long Island, New York Bay, and Hudson River. (Second edition.)	95, quarto.	21	1 vol., Government Printing Office, 1880.
	NOTE.—The volumes of the Atlantic Local Coast. Pilot numbered as Subdivisions 7 to 13, inclusive, and enumerated as above, appear as separate parts of the large volume Atlantic Coast Pilot, Division B, Boston to New York (second edition), and like that volume were compiled and prepared for publication by J. S. Bradford, Assistant.			
1882	Atlantic Local Coast Pilot. Subdivision 14. New York to Delaware entrance. (First edition.)	95, quarto.	13	1 vol., Government Printing Office, 1882.
1883	Atlantic Local Coast Pilot. Subdivision 15. Delaware Bay and tributaries. (First edition.)	159, quarto.	11	1 vol., Government Printing Office, 1883.
1883	Pacific Coast Pilot. Alaska. Part I. Coast from Dixon entrance to Yakutat Bay, with the inland passage.	342, quarto.	53	1 vol., Government Printing Office, 1883.
1885	Atlantic Local Coast Pilot. Subdivision 19. Cape Henry to Winyah Bay, and inside passages. (First edition.)	89, quarto.	21	1 vol., Government Printing Office, 1885.

CATALOGUE OF COAST PILOTS FOR THE ATLANTIC AND PACIFIC COASTS, ETC.—Continued.

Year of publication.	Title.	Number of pages and size.	Number of charts, views, etc.	Mode of publication.
1885	Atlantic Local Coast Pilot. Subdivision 20. Winyah Bay to Savannah, with the inland passage to Fernandina. (First edition.)	83, quarto.	17	1 vol., Government Printing Office, 1885.
1886	Atlantic Local Coast Pilot. Subdivision 13. South coast of Long Island, New York Bay, and Hudson River. (Third edition.)	99, quarto.	8	1 vol., Government Printing Office, 1886.
1887	Atlantic Local Coast Pilot. Subdivision 21. Tybee Roads to Jupiter Inlet. (First edition.)	106, quarto.	11	1 vol., Government Printing Office, 1887.
1888	Atlantic Local Coast Pilot. Subdivision 6-7. Cape Ann to Monomoy. (Third edition.)	143, quarto.	9	1 vol., Government Printing Office, 1888.
1888	United States Coast Pilot. Atlantic Coast. Part IV.* Long Island Sound, with approaches and adjacent waters. (First edition.)	155, quarto.	15	1 vol., Government Printing Office, 1888.
1889	United States Coast Pilot. Atlantic Coast. Part IV. Chesapeake Bay and tributaries. (First edition.)	135, quarto.	32	1 vol., Government Printing Office, 1889.
1889	Atlantic Local Coast Pilot. Subdivision 22. Straits of Florida, Jupiter Inlet to Dry Tortugas. (First edition.)	95, quarto.	2	1 vol., Government Printing Office, 1889.
1889	Pacific Coast. Coast Pilot of California, Oregon, and Washington. By George Davidson, Assistant. (Fourth edition.)	721, quarto.	457	1 vol., Government Printing Office, 1889.
1891	Pacific Coast Pilot. Alaska. Part I. Dixon Entrance to Yakutat Bay, with Inland Passage from the Strait of Fuca to Dixon Entrance. (Third edition.)	243, quarto.	32	Government Printing Office.
1891	United States Coast Pilot. Atlantic Coast. Parts 1 and 2. From the St. Croix River to Cape Ann. (First edition.) Part 1.	105, quarto.	18	Do.
	Part 2	96, quarto.	16	Bound with Part I.
1892	United States Coast Pilot. Atlantic Coast. Part 4. From Point Judith to New York. (Second edition.)	156, quarto.	13	Government Printing Office.
1893	United States Coast Pilot. Atlantic Coast. Part 3. From Cape Ann to Point Judith. (First edition.)	153, quarto.	5	Do.
1894	United States Coast Pilot. Atlantic Coast. Part 6. Supplement to first edition (1889). Chesapeake Bay and tributaries.	8, quarto.		Pamphlet, Government Printing Office.
1895	United States Coast Pilot. Atlantic Coast. Part 5. From New York to Chesapeake Bay entrance. (First edition.)	120, quarto.	6	Do.
1895	United States Coast Pilot. Atlantic Coast. Part 7. From Chesapeake Bay entrance to Key West. (First edition.)	157, quarto.	7	Do.
1895	Supplement to First Edition. United States Coast Pilot. Atlantic Coast. Part 5. From New York to Chesapeake Bay entrance.	9, quarto.		Do.

* This volume takes the place of Subdivisions 10, 11, and 12, Atlantic Local Coast Pilot, and of pp. 304-549 of Division B, Atlantic Coast Pilot.

CATALOGUE OF COAST PILOTS FOR THE ATLANTIC AND PACIFIC COASTS, ETC.—Continued.

Year of publication.	Title.	Number of pages and size.	Number of charts, views, etc.	Mode of publication.
1895	Supplement to Second Edition. United States Coast Pilot. Atlantic Coast. Part 4. From Point Judith to New York.	14, quarto.		Pamphlet, Government Printing Office.
1895	Supplement to First Edition. United States Coast Pilot. Atlantic Coast. Part III. From Cape Ann to Point Judith.	11, quarto.		Do.
1895	Supplement to the First Edition. United States Coast Pilot. Atlantic Coast. Parts I and II. From the St. Croix River to Cape Ann.	11, quarto.		Do.
1895	Supplement to United States Coast Pilot. Atlantic Coast. Parts 1, 2, 3, 4, 5, 6, 7. Rules of the Road at Sea and in Harbors, Rivers, and Inland Waters (except the Great Lakes and their tributary waters as far east as Montreal).	14, quarto.		Do.

VI.

CATALOGUES OF MAPS AND CHARTS PUBLISHED BY THE U. S. COAST AND GEODETIC SURVEY BETWEEN THE YEARS 1843 AND 1896.

U. S. COAST AND GEODETIC SURVEY.

Date of publication.		Title of catalogue.	Number of pages and size.	No. of maps and charts.	Mode of publication.
Catalogue.	Charts.				
1843	1835–1842	List of the individual maps executed and delivered. NOTE.—The list above named is published also in Report No. 170, designated as Twenty-seventh Congress, third session, Report No. 170, House of Representatives.	1, octavo.	8	Twenty-seventh Congress, third session. House Report No. 43. (Report of Select Committee on Coast Survey.)
1849	1842–1849	List of Coast Survey maps engraved.	1, octavo.	33	Thirty-first Congress, first session. Senate Ex. Doc. No. 5. (Report of Superintendent Coast Survey for 1849. Appendix No. 2, *bis*.)
1850	1842–1850	.....do	1, octavo.	43	Thirty-first Congress, second session. House Ex. Doc. No. 12. (Report of Superintendent Coast Survey for 1850. Appendix No. 38.)
1852	1842–1851	List of Coast Survey maps, sketches, and preliminary charts, engraved.	2, octavo.	78	Thirty-second Congress, first session. Senate Ex. Doc. No. 3. (Report of Superintendent Coast Survey for 1851. Appendix No. 11.)
1853	1842–1852	List of Coast Survey maps, sketches, and preliminary charts.	2, quarto.	89	Thirty-second Congress, second session. Executive No. 64, House of Representatives. (Report of Superintendent Coast Survey for 1852. Appendix 6.)
1854	1842–1853	.....do	2, quarto.	129	Thirty-third Congress, first session, Executive 14, Senate. (Report of Superintendent Coast Survey for 1853. Appendix 5.)
1855	1842–1854	.....do	3, quarto.	147	Thirty-third Congress, second session, Executive 20, House of Representatives. (Report of Superintendent Coast Survey for 1854. Appendix 31.)
1856	1842–1855	.....do	4, quarto.	192	Thirty-fourth Congress, first session, Executive 6, House of Representatives. (Report of Superintendent Coast Survey for 1855. Appendix 36.)
1856	1842–1856	List of Coast Survey maps, preliminary charts, and sketches, engraved, geographically arranged.	5, quarto.	221	Thirty-fourth Congress, third session, Executive 12, Senate. (Report of Superintendent Coast Survey for 1856. Appendix 19.)

CATALOGUES OF MAPS AND CHARTS, ETC.—Continued.

Date of publication.		Title of catalogue.	Number of pages and size.	No. of maps and charts.	Mode of publication.
Catalogue	Charts.				
1858	1842–1857	List of Coast Survey maps, preliminary charts, and sketches, engraved, geographically arranged.	6, quarto.	240	Thirty-fifth Congress, first session, Executive 33, Senate. (Report of Superintendent Coast Survey for 1857. Appendix 22.)
1859	1842–1858	.....do	6, quarto.	260	Thirty-fifth Congress, second session, Executive 14, Senate. (Report of Superintendent Coast Survey for 1858. Appendix 19.)
1860	1842–1859	.....do	6, quarto.	268	Thirty-sixth Congress, first session, Executive 41, House of Representatives. (Report of Superintendent Coast Survey for 1859. Appendix 17.)
1861	1842–1860	.....do	6, quarto.	278	Thirty-sixth Congress, second session, Executive —. Senate. (Report of Superintendent Coast Survey for 1860. Appendix 19.)
1862	1842–1861	.....do	6, quarto.	290	Thirty-seventh Congress, second session, Executive —, Senate. (Report of Superintendent Coast Survey for 1861. Appendix 12.)
1863	1846–1863	Catalogue of hydrographic maps, charts, and sketches published by the U. S. Coast Survey.—A. D. Bache, Superintendent, 1863.	17, quarto.	242	Washington. Government Printing Office. 1863.
1866	1846–1864	Catalogue of hydrographic maps, charts, and sketches published by the U. S. Coast Survey.—A. D. Bache, Superintendent. 1866.	17, quarto.	242	Washington. Government Printing Office.
1867	1846–1867	Same.—Benjamin Peirce, Superintendent. 1867.	18, quarto.	276	Do.
1872	1846–1872	Same.—Benjamin Peirce, Superintendent. 1872.	20, quarto.	278	Do.
1875	1851–1875	U.S. Coast Survey.—Carlile P. Patterson, Superintendent. Catalogue of charts. 1875.	28, quarto.	299	Do.
1877	1851–1877	Catalogue of charts of the U. S. Coast Survey, 1877.—Carlile P. Patterson, Superintendent.	29, quarto.	325	Do.
1880	1846–1880	U. S. Coast and Geodetic Survey. Catalogue of charts, 1880.—Carlile P. Patterson, Superintendent.	45, quarto.	409	Do.
1883	1846–1883	U. S. Coast and Geodetic Survey. Catalogue of charts, 1883.—J. E. Hilgard, Superintendent.	64, quarto.	389	Do.
1884	1846–1884	U. S. Coast and Geodetic Survey. Catalogue of charts, 1884.—J. E. Hilgard, Superintendent.	68, quarto.	384	Do.
1886	1846–1886	U. S. Coast and Geodetic Survey, Catalogue of charts, 1886.—F.M.Thorn, Superintendent.	72, quarto.	395	Do.

CATALOGUES OF MAPS AND CHARTS, ETC.—Continued.

Date of publication.		Title of catalogue.	Number of pages and size.	No. of maps and charts.	Mode of publication.
Catalogue.	Charts.				
1887	1846-1887	U. S. Coast and Geodetic Survey. Catalogue of charts and other publications, 1887.—F. M. Thorn, Superintendent.	140, quarto.	458	Washington. Government Printing Office.
1890	1846-1890	U. S. Coast and Geodetic Survey. Catalogue of charts and other publications, 1890.—T.C.Mendenhall, Superintendent.	156, quarto.	476	Do.
1892	1846-1892	U. S. Coast and Geodetic Survey. Catalogue of charts and other publications, 1892.—T.C.Mendenhall, Superintendent.	152, quarto.	489	Pamphlet, Government Printing Office.
1894	1846-1894	U. S. Coast and Geodetic Survey. Catalogue of charts and other publications, 1894.—W. W. Duffield, Superintendent.	148, quarto.	536	Do.
1896	1846-1896	U. S. Coast and Geodetic Survey. Catalogue of charts and other publications, 1896.—W. W. Duffield, Superintendent.	142, quarto.	501	Do.

VII.

NOTICES TO MARINERS FROM THE DATE OF EARLIEST PUBLICATION BY THE COAST SURVEY TO THE YEAR 1890.

This list begins with the earliest separate publication of these notices on file in the Coast and Geodetic Survey Office. The annual reports previous to 1869 contain many such notices in the form of communications from the Superintendent to the Secretary of the Treasury, with requests that authority be given to publish for the benefit of mariners. The separate publications of these notices since 1869 are for special distribution, and are supplementary to the publication formerly made and still continued in the leading commercial and nautical journals. For general lists of discoveries and developments see the Reports from 1850 to 1864, inclusive.

U. S. COAST AND GEODETIC SURVEY.

Number.	Date of notice.	Title.
	1869, July 12	Notice to Mariners. Pacific Coast. Shoal off Cape Reyes, California.
	1872, Jan. 22	Notice to Mariners. Atlantic Coast. East coast of Florida. St. Lucie Shoal.
	1874, June 20	Notice to Mariners. Northwest coast of America. Aleutian Islands.
	1874, Oct. 10	Notice to Mariners. Atlantic Coast. Long Island Sound.
1	1875, Jan. 14	Notice to Mariners, No. 1. Atlantic Coast. Sailing directions for St. Augustine Harbor.
2	1875, Jan. 26	Notice to Mariners, No. 2. Pacific Coast. Sailing directions for Macks Shelter, Oregon.
3	1875, Feb. 10	Notice to Mariners, No. 3. Pacific Coast. Sunken rock off the boundary of California and Oregon.
4	1875, May 4	Notice to Mariners, No. 4. Pacific Coast. Additional peaks, Noonday Rock, entrance to San Francisco Bay, California.
5	1875, May 7	Notice to Mariners, No. 5. Pacific Coast. Sunken rock off Cape Mendocino, California.
6	1875, May 20	Notice to Mariners, No. 6. Pacific Coast. Sunken Rocks. San Luis Obispo Bay, California.
7	1875, July 24	Notice to Mariners, No. 7. Pacific Coast. Shoal near South Farallon.
8	1875, Sept. 4	Notice to Mariners, No. 8. Pacific Coast. Dangerous shoal in the northern approach to San Miguel Passage.
9	1875, Sept. 20	Notice to Mariners, No. 9. Atlantic Coast. Approaches to Chesapeake Bay. Wreck 12 miles to the southward and eastward of Cape Henry.
10	1875, Nov. 4	Notice to Mariners, No. 10. Atlantic Coast. Ledge in Delaware River.
11	1876, Feb. 8	Notice to Mariners, No. 11. Gulf of Mexico. Positions of wrecks at the entrance of Pensacola Bay, Florida.
12	1877, May 16	Notice to Mariners, No. 12. Atlantic Coast. Chesapeake Bay. Wreck off New Point Comfort, Virginia.
13	1877, Dec. 15	Notice to Mariners, No. 13. Atlantic Coast. Wreck off Currituck Beach, North Carolina.
14	1877, Dec. 21	Notice to Mariners, No. 14. Gulf of Mexico. Observations upon northers and southeast gales.
15	1878, Mar. 7	Notice to Mariners, No. 15. Gulf of Maine. Tidal currents at entrance.
15	1878, June 15	Notice to Mariners, No. 15. Gulf of Maine. Tidal currents at entrance. [Second edition.]
16	1878, May 9	Notice to Mariners, No. 16. Atlantic Coast. Florida Reefs. Disappearance of a beacon.
17	1878, July 16	Notice to Mariners, No. 17. Atlantic Coast. Nantucket Sound. Wreck in Hyannis Harbor.

NOTICES TO MARINERS—Continued.

Number.	Date of notice.	Title.
18	1879, June 27	Notice to Mariners, No. 18. Pacific Coast. Depth of water over the bar at entrance of Wilmington Harbor, California.
19	1879, June 27	Notice to Mariners, No. 19. Coast of Alaska. Location of Keen Rock in the middle passage to Sitka Harbor, Alaska.
20	1879, June 27	Notice to Mariners, No. 20. Atlantic Coast. Closing of New Inlet, mouth of Cape Fear River, North Carolina.
21	1879, July 9	Notice to Mariners, No. 21. Atlantic Coast. Increased depth of water at entrance of Cape Fear River, North Carolina.
22	1879, July 14	Notice to Mariners, No. 22. Atlantic Coast. Sunken wreck in the track of vessels running along the New Jersey coast.
23	1879, July 25	Notice to Mariners, No. 23. Atlantic Coast. Development of Johnsons Rock, Casco Bay, Maine.
24	1879, Oct. 14	Notice to Mariners, No. 24. Atlantic Coast. Dangerous rock near Isle of Wight Shoal, coast of Maryland.
25	1879, Nov. 15	Notice to Mariners, No. 25. Atlantic Coast. Development of Schuylers Ledge, off Sakonnet Point, Rhode Island.
26	1880, June 7	Notice to Mariners, No. 26. Pacific Coast. Development of dangerous rocks near Fort Ross, California.
27	1880, Dec. 16	Notice to Mariners, No. 27. Atlantic Coast. Sunken wreck in entrance to Rappahannock River, Virginia.
28	1881, Apr. 26	Notice to Mariners, No. 28. Atlantic Coast. Improvements of rivers and harbors on the coasts of Maine and Massachusetts, under the direction of Gen. George Thom, Engineer Corps, U. S. Army.
29	1881, Apr. 27	Notice to Mariners, No. 29. Atlantic Coast. Connecticut. Breakwater in process of construction to the westward of Bartletts Reef, Fishers Island Sound.
30	1881, June 1	Notice to Mariners, No. 30. Atlantic Coast. Sunken wreck off the east coast of Florida.
31	1881, June 1	Notice to Mariners, No. 31. Pacific Coast. Reported dangers in the approaches to St. Paul Harbor, Kadiak Island, Alaska.
32	1881, July 20	Notice to Mariners, No. 32. Atlantic Coast. New Shoal. Frying-Pan Shoals, off Cape Fear, North Carolina.
33	1881, Nov. 10	Notice to Mariners, No. 33. Atlantic Coast. Development of Fiske Rock, Narragansett Bay, Rhode Island.
34	1882, Aug. 24	Notice to Mariners, No. 34. Atlantic Coast. Dangerous rock in eastern entrance to Fishers Island Sound.
		NOTE.—The greater number of the above-named notices are printed somewhat as handbills, in large type for easy reading, and occupy about one page quarto.
35	1883, Jan. 14	Notice to Mariners, No. 35. Atlantic Coast. Dangerous rocks in western part of Fishers Island Sound. Approaches to New London and Mystic Harbors.
36	1883, May 14	Notice to Mariners, No. 36. Atlantic Coast. Sunken wreck in the track of vessels along the New Jersey coast.
37	1883, June 8	Notice to Mariners, No. 37. Atlantic Coast. Wreck in the track of vessels along the east coast of Florida.
38	1883, June 19	Notice to Mariners, No. 38. Pacific Coast. Discovery of a rock in Surge (or Southern) Narrows, Peril Strait, Southeast Alaska.
39	1883, June 22	Notice to Mariners, No. 39. Atlantic Coast. Wreck in the track of coasting vessels off New Jersey.
40	1883, Oct. 31	Notice to Mariners, No. 40. Atlantic Coast. Dangerous rock off Warrens Point, Rhode Island.
41	1883, Nov. 9	Notice to Mariners, No. 41. Atlantic Coast. Dangerous rocks recently reported on the coast of Maine, near Muscongus and Booth Bays. Wreck off Tarpaulin Cove, Vineyard Sound.
42	1883, Nov. 13	Notice to Mariners, No. 42. Atlantic Coast. Rock reported in Eggemoggin Reach, Maine. Rocks in East River, New York, near North Brother and Rikers Islands.
43	1883, Nov. 26	Notice to Mariners, No. 43. Atlantic Coast. Dangerous shoals off Cape Henlopen, Delaware.
44	1883, Dec. 8	Notice to Mariners, No. 44. Atlantic Coast. Wreck in Potomac River, near Blackistone Island.
45	1884, Mar. 20	Notice to Mariners, No. 45. Atlantic Coast. Dangerous shoals in Monomoy Passage.

NOTICES TO MARINERS—Continued.

Number.	Date of notice.	Title.
46	1884, May 27	Notice to Mariners, No. 46. Pacific Coast. Notes on dangers in Neva and Peril Straits and anchorages in Fish Bay, Southeast Alaska.
47	1884, May 28	Notice to Mariners, No. 47. Atlantic Coast. Dangerous ledges in Fishers Island Sound.
48	1884, May 31	Notice to Mariners, No. 48. Atlantic Coast. Dangerous rock in East River, New York.
49	1884, June 1	Notice to Mariners, No. 49. Atlantic Coast. Dangerous ledge in Englishmans Bay, coast of Maine.
50	1884, June 10	Notice to Mariners, No. 50. Atlantic Coast. Development of ledges off Minots Ledge Lighthouse, Massachusetts Bay.
51	1884, June 30	Notice to Mariners, No. 51. Atlantic Coast. Important changes at and near Cape Henlopen.
52	1884, Aug. 11	Notice to Mariners, No. 52. Atlantic Coast. Dangerous rock in East River, New York.
53	1884, Sept. 15	Notice to Mariners, No. 53. Changes in the pilotage laws of the port of New York.
54	1884, Oct. 7	Notice to Mariners, No. 54. Atlantic Coast. Rocks recently reported on the coast of New England.
55	1884, Nov. 1	Notice to Mariners, No. 55. Atlantic Coast. I. Dangerous ledges developed in the resurvey of Long Island Sound. II. Ledge near Seal Rock, Rhode Island.
56	1884, Nov. 15	Notice to Mariners, No. 56. Atlantic Coast. Shoal developed in Vineyard Sound.
57	1884, Nov. 15	Notice to Mariners, No. 57. Pacific Coast. Discovery of a rock in Security Bay, Kuin Island, Chatham Strait, Alaska.
58	1885, Feb. 10	Notice to Mariners, No. 58. Atlantic Coast. I. Development of shoals in Narragansett Bay, Rhode Island, and Block Island Sound. II. Development of Sabine Bank, off Sabine Pass, Gulf of Mexico.
59	1885, Mar. 23	Notice to Mariners, No. 59. Atlantic Coast. Changes in main ship channel, Vineyard Sound.
60	1885, Mar. 23	Notice to Mariners, No. 60. Pacific Coast. Sailing directions for Wrangell Strait, Alaska.
61	1885, June 12	Notice to Mariners, No. 61. Pacific Coast. Sailing directions for inland passage between Sitka Harbor and Hooniah Sound, through Olga Strait, Neva Strait, and Peril Straits, Alaska.
62	1885, July 1	Notice to Mariners, No. 62. Gulf of Mexico. Shoal developed near Marquesas Keys, Florida.
63	1885, Aug. 24	Notice to Mariners, No. 63. Atlantic Coast. Ledges developed in the resurvey of Long Island Sound.
64	1885, Oct. 6	Notice to Mariners, No. 64. Atlantic Coast. Dangerous rock developed in the resurvey of East River, New York.
65	1885, Oct. 12	Notice to Mariners, No. 65. Atlantic Coast. Dangers developed in the resurvey of East River, New York.
66	1885, Oct. 21	Notice to Mariners, No. 66. Atlantic Coast. Development of bar between Thatchers Island and Milk Island, Massachusetts.
67	1885, Oct. 21	Notice to Mariners, No 67. Atlantic Coast. Ledge developed in Boston Bay, Massachusetts.
68	1885, Nov. 20	Notice to Mariners, No. 68. Atlantic Coast. Dangers developed in the resurvey of East River, New York.
69	1885, Nov. 20	Notice to Mariners, No. 69. Atlantic Coast. Important changes in Monomoy Passage, Massachusetts.
70	1885, Nov. 30	Notice to Mariners, No. 70. Atlantic Coast. Ledge developed in Fishers Island Sound, Connecticut.
71	1885, Dec. 7	Notice to Mariners, No. 71. Atlantic Coast. Examination of dangers reported on the coast of Maine.
72	1886, Mar. 31	Notice to Mariners, No. 72.* Coast of the United States. Chart corrections during the quarter ending March 31, 1886.
73	1886, May 12	Notice to Mariners, No. 73. Dangerous wreck on Charleston Bar.
74	1886, May 21	Notice to Mariners, No. 74. Atlantic Coast. Dangerous wreck on Charleston Bar. (Addition to Notice to Mariners, No. 73.)
75	1886, May 31	Notice to Mariners, No. 75. Atlantic Coast. Danger developed in the resurvey of East River, New York.

*NOTE.—This was the first number of the quarterly series of these notices, the publication of which was recommended by the Hydrographic Inspector.

NOTICE TO MARINERS—Continued.

Number.	Date of notice.	Title.
76	1886, June 30	Notice to Mariners, No. 76. Coast of the United States. Chart corrections during the quarter ending June 30, 1886.
77	1886, Sept. 30	Notice to Mariners, No. 77. Coast of the United States. Chart corrections during the quarter ending September 30, 1886.
78	1886, Oct. 13	Notice to Mariners, No. 78. Atlantic Coast. Velocity and direction of the Gulf Stream between Fowey Rocks, Florida, and Gun Cay, Bahamas.
79	1886, Oct. 15	Notice to Mariners, No. 79. Atlantic Coast. Development of shoals off False Cape, Virginia.
80	1886, Oct. 23	Notice to Mariners, No. 80. Atlantic Coast. Ledges developed in the resurvey of Long Island Sound.
81	1886, Nov. 8	Notice to Mariners, No. 81. Coast of the United States. Correction of an error in Notice to Mariners, No. 77.
82	1886, Dec. 1	Notice to Mariners, No. 82. Atlantic Coast. Ledge developed in East River, New York.
83	1886, Dec. 31	Notice to Mariners, No. 83. Coast of the United States. Chart corrections during the quarter ending December 31, 1886.
84	1887, Jan. 8	Notice to Mariners, No. 84. Atlantic Coast. Obstruction to navigation in the Gulf Stream.
85	1887, Mar. 31	Notice to Mariners, No. 85. Coast of the United States. Chart corrections during the quarter ending March 31, 1887.
86	1887, Apr. 16	Notice to Mariners, No. 86. Atlantic Coast. Dangerous sunken wreck in Long Island Sound.
87	1887, June 9	Notice to Mariners, No. 87. Atlantic Coast. Shoal spot on rocky ledge off Eatons Point, Long Island Sound, New York.
88	1887, June 30	Notice to Mariners, No. 88. Coast of the United States. Chart corrections during the quarter ending June 30, 1887.
89	1887, July 30	Notice to Mariners, No. 89. Coast of the United States. Chart corrections during the month of July, 1887.
		NOTE.—With this number was begun the monthly series of these notices, as follows:
89-92	1887.....	Nos. 89 to 92, inclusive. Chart corrections for the months of July, August, September, and October, 1887.
93	1887, Nov. 8	Notice to Mariners (1887), No. 93. Atlantic Coast. Dangerous rock in Vineyard Sound, Massachusetts.
94	1887, Nov. 22	Notice to Mariners (1887), No. 94. Coast of the United States. Gulf Stream currents.
95-96	1887.....	Nos. 95 and 96. Chart corrections for the months of November and December, 1887.
	.....	Index to U. S. Coast and Geodetic Survey Notices to Mariners (Nos. 1 to 96).
97	1888, Jan. 9	Notice to Mariners, No. 97. Coast of the United States. Coast currents approaching Sandy Hook.
98-109	1888.....	Nos. 98 to 109, inclusive. Chart corrections for the months of January, February, March, April, May, June, July, August, September, October, November, and December, 1888.
	.....	Index to U. S. Coast and Geodetic Survey Notices to Mariners published during 1888 (Nos. 97 to 109).
	.....	U. S. Coast and Geodetic Survey. Index to chart corrections. January 1 to December 31, 1888.
110-113	1889.....	Nos. 110 to 113, inclusive. Chart corrections for the months of January, February, March, and April, 1889.
114	1889, May 1	Notice to Mariners (1889), No. 114. Atlantic Coast. Off-shore current observations. Information of special importance to mariners.
115-117	1889.....	Nos. 115 to 117, inclusive. Chart corrections for the months of May, June, and July, 1889.
118	1889, Aug. 15	Notice to Mariners (1889), No. 118. Information concerning U. S. Coast and Geodetic Survey charts.
119-123	1889.....	Nos. 119 to 123, inclusive. Chart corrections for the months of August, September, October, November, and December, 1889.
	.....	U. S. Coast and Geodetic Survey. Index to chart corrections, 1889. January 1 to December 31.
124-135	1890.....	Nos. 124 to 135, inclusive. Chart corrections for the months of January, February, March, April, May, June, July, August, September, October, November, and December, 1890.

NOTICES TO MARINERS—Continued.

Number.	Date of notice.	Title.
136	1890, Dec. 31	U. S. Coast and Geodetic Survey. Index to chart corrections. January 1 to December 31, 1890. (Notice to Mariners, No. 126.)
137-148	1891	Nos. 137 to 148, inclusive. Chart corrections for the months of January, February, March, April, May, June, July, August, September, October, November, and December, 1891.
149	1891, Dec. 31	Index to chart corrections January 1 to December 31, 1891.
150-161	1892	Nos. 150 to 161, inclusive. Chart corrections for the months from January to December, 1892.
162	1892, Dec. 31	Index to chart corrections January 1 to December 31, 1892.
163-174	1893	Nos. 163 to 174, inclusive. Chart corrections for the months from January to December, 1893.
175	1893, Dec. 31	Index to chart corrections January 1 to December 31, 1893.
176-187	1894	Nos. 176 to 187, inclusive. Chart corrections for the months from January to December, 1894.
188	1894, Dec. 31	Index to chart corrections January 1 to December 31, 1894.
189-200	1895	Nos. 189 to 200, inclusive. Chart corrections for the months from January to December, 1895.
201	1895, Dec. 31	Index to notices of Mariners, 1895. Chart corrections. January 1 to December 31, 1895.
202	1896, Jan. 27	No. 202. Coast of the United States. Tidal Indicator in Delaware River, Delaware.
203-214	1896	Nos. 203 to 214, inclusive. Chart corrections for the months from January to December, 1896.
	1897, Jan. —	Index to Notices to Mariners, 1896. Chart corrections January 1 to December 31, 1896.

VIII.

BULLETINS.

Bulletins are issued by the Survey from time to time as material for them accumulates. They are intended to give early announcement of work accomplished or information of importance obtained, and will in many cases anticipate the usual means of publication afforded by the Annual Reports. The pages are numbered consecutively, and will be indexed when their number demands it, thus augmenting their value for preservation and reference.

No.	Date of publication.	Title.	Pages.
1	1888, May 14	Recent publications	1
2	1888, June 20	Notes on Alaska from Recent Surveys	3-6
3	1888, Aug. —	Tidal Levels and Flow of Currents in New York Bay and Harbor. (Two illustrations.) By Henry L. Marindin, Assistant.	7-12
4	1888, May 25	Resources of and Developments in Alaska. By George Davidson, Assistant.	13-24
5	1888, May 1	The value of the "Arcano del Mare" with reference to our knowledge of the Magnetic Declination in the earlier part of the Seventeenth Century. By Charles A. Schott, Assistant. (Two illustrations.)	25-28
6	1888, May 5	Secular Variation in the Position of the Agonic line of the North Atlantic and of America, between the epochs 1500 and 1900 A. D. By Charles A. Schott, Assistant. (Three illustrations.)	29-43
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