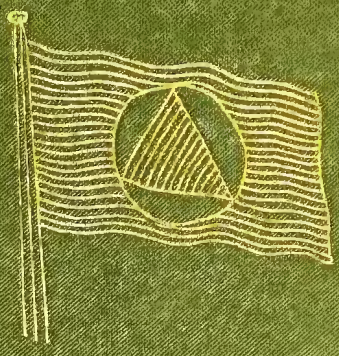

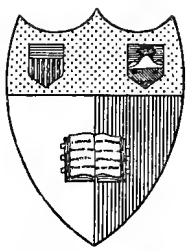

TREASURY DEPARTMENT

UNITED STATES COAST AND GEODETIC SURVEY

O. H. TITTMANN

SUPERINTENDENT

LIST AND CATALOGUE

OF THE

PUBLICATIONS

ISSUED BY THE

U. S. COAST AND GEODETIC SURVEY

1816–1902

By E. L. BURCHARD, Librarian

WASHINGTON

GOVERNMENT PRINTING OFFICE

1902

CONTENTS.

PREFACE.

The following List (Part I) and Catalogue (Part II) was compiled in response to demands for information in regard to the publications of the United States Coast and Geodetic Survey, and relates entirely to these publications:

Previous to July 1, 1878, this Bureau was called the United States Coast Survey, which explains the apparent discrepancy in the title of the publications issued before and since that date.

The List is arranged in chronological order and the Catalogue alphabetically by authors, subjects, and places, with numerous cross references. All of the subject headings used in this Catalogue are given in systematic order at the beginning of the Catalogue.

The publications in the List and Catalogue marked "Exhausted" are no longer available for distribution. All others can be obtained, free of charge, upon application to the Superintendent United States Coast and Geodetic Survey, Washington, D. C., except the Coast Pilots and Tide Tables, which are sold at the cost of paper and printing.

Indexes and catalogues of the Survey's publications have previously been issued under the following titles:

REPORTS ONLY.

1844–1853. "Consolidated alphabetical index." Subjects and authors in one alphabetical arrangement. By Lieut. E. B. Hunt, U. S. A., assistant ..... In Report 1854
"Consolidated index of sketches." Also by Lieutenant Hunt..... In Report 1854
1854–1863. "Consolidated alphabetical index." By Subassistant F. F. Nes..... In Report 1864
"Consolidated index of sketches." Also by Mr. Nes..... In Report 1864
1851–1870. "General index of professional and scientific papers," arranged systematically in classes by subjects. This is the Hunt index recompiled and arranged in a new order by Edward Goodfellow, assistant..... App. 17, Report 1871
1845–1880. "General index of scientific papers." Subject classification. By C. H. Sinclair, subassistant ..... App. 6, Report 1881

ALL PUBLICATIONS.

1844–1885. "Descriptive catalogue of publications." This is the first list of publications, but included also some additional indexing and much bibliographic material. Prepared by Assistant Goodfellow..... App. 6, Report 1883
"General index to the progress sketches, illustrations, maps, and charts." The index enlarged and arranged in classes by places and subjects by Edward Goodfellow, assistant..... App. 12, Report 1887
1807–1890. "Descriptive catalogue." The index of Goodfellow and catalogue of Sinclair revised and enlarged. By Assistant J. B. Baylor..... App. 11, Report 1891
1807–1898. "Bibliography." The preceding edition republished with additions. Special publication No. 2, 1898.

PART I.—LIST.

ANNUAL REPORTS.

The Annual Report of the Superintendent of the United States Coast and Geodetic Survey, fully illustrated with maps and diagrams, is made under law to Congress at each session, and shows in detail the persons employed, the work accomplished, and the expenditures under the annual appropriations.

Originally appearing as a document in the Congressional series only, it has also been published in a separate Survey edition since 1851. For 1851 separate volumes were issued for the text and for the sketches. From 1891 to 1894, inclusive, the report proper and the appendices were printed in separate volumes as Parts I and II. With these exceptions the report has been issued annually since 1851 in one quarto volume.

The appendices on scientific and professional subjects include almost all of the material of that character published by the Survey, whether issued in some other series or not. The appendices have also been printed apart from the reports in "separate" form when the demand for them has warranted such publication.

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 also being called 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.

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 length of this List by including these office reports, embodying as they do much matter relating to routine operations and details of value chiefly for official reference.

The office of standard weights and measures was organized under the Superintendent of the Coast Survey in 1831, and its reports have been issued regularly since 1837 as a part of his official report. They are therefore contained in the following list of reports.

Many individual scientific papers on standards based on the work of this office were printed as appendices in the report of the Superintendent of the Survey. All of them will be found grouped under the subject headings "Standards" and "Weights and measure office" in the Catalogue (Part II).

On July 1, 1901, the act of Congress approved March 3, 1901, creating the National Bureau of Standards. became fully operative and on that date it became an independent Bureau.

1807-16

[Under Treasury department. Period of organization. Reports made through correspondence chiefly. F. R. Hassler in charge of work.]

1816

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.

21 pp. 22cm. (Senate doc. 143, 15th Cong., 1st sess. In v. 2.)

Report dated "Newark, New Jersey, 23d Nov. 1816."

Also published in Principal documents relating to the survey of the coast of the United States since 1816. Published by F. R. Hassler, superintendent of the survey. New York, William Van Norden, printer, 1834. pp. 12-36.

1817

[Under Treasury department. No report sent to Congress.]

1818-32

[Under War department by transfer from Treasury department. Work in abeyance.]

1832-33

[Under Treasury department (1832-34). Reorganized by act July 10, 1832. No regular reports other than through correspondence.]

1834

[Under Navy department (1834-35) by transfer from Treasury department, in effect March 12, 1834.]

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.

17 pp. 22cm. (Senate doc. 1, 23d Cong., 2d sess. In v. 1.)

This is the second report and was signed at Washington city, May 17, 1834.

Also published in Rept. Secretary of the navy, 1834, p. 364. Also as House doc. 2, 23d Cong., 1st sess. In v. 1. Also in Principal documents relating to the survey of the coast of the United States since 1816. Published by F. R. Hassler, superintendent of the survey. New York, William Van Norden, printer, 1834. pp. 141-154.

Report of F. R. Hassler as superintendent of the survey of the coast, additional to that dated May 17, containing an account of the progress of that work during the summer and until November of 1834.

17 pp. 22cm. (Senate doc. 1, 23d Cong., 2d sess. In v. 1.)

This supplemental report was signed at "West Hills, Huntington township, Long Island," Nov. 11, 1834, and was combined with it in the Congressional series.

Also published as House doc. 2, 23d Cong., 1st sess. In v. 1. Also in Rept. Secretary of the navy, 1834, p. 364. Also in Principal documents relating to the survey of the coast. Published by F. R. Hassler. N. Y., 1834. pp. 171-178.

1835

Third report of F. R. Hassler as superintendent of the survey of the coast, upon the progress of that work from November, 1834, until May, 1835.

(In Second volume of the principal documents relating to the survey of the coast of the United States from October, 1834, to November, 1835. Published by F. R. Hassler, superintendent of the survey. New York, William Van Norden, printer, 1835. pp. 103–107.

Report signed at "Washington city, May 8th, 1835."
Not printed in Rept. Secretary of the navy, and therefore does not appear in the Congressional series.

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 pp. 22cm. (Senate doc. 1, 24th Cong., 1st sess. In v. 1.)

Report signed at New York, Nov. 22, 1835.
Also published as House doc. 2, 24th Cong., 1st sess. In v. 1. Also in Rept. Secretary of the navy, 1835, p. 380. Also in Second volume of the principal documents relating to the survey of the coast. Published by F. R. Hassler. N. Y., 1835. pp. 151–156.

1836

[Under Treasury department for this and all subsequent years. Retransfer from Navy department, in effect March 25, 1836.]

Fifth report of F. R. Hassler, superintendent of the coast survey, and of the construction of standard weights and measures, exhibiting the operations performed in 1836.

(In Documents relating to the construction of standards of weights and measures for the custom-houses from March to November, 1835. By F. R. Hassler, superintendent of the works. N. Y., William Van Norden, printer, 1835. pp. 118–123.)

Report signed at "West Hills, Long Island," Nov. 19, 1836.
Not printed in Rept. Secretary of the treasury, and therefore does not appear in the Congressional series. No separate survey edition.

1837

Report from the Secretary of the treasury, transmitting the report of F. R. Hassler, superintendent of the coast survey, and of the fabrication of standard weights and measures ["rendering account of the works of 1837"]. Blair & Rives, printers. [Washington, D. C.]

16 pp. 22cm. (Senate doc. 79, 25th Cong., 2d sess. In v. 1.)

Sixth report. Signed at "Harrow Hill, near Hempstead Harbor, L. I., November 18, 1837.'
886 additional copies printed for use of Senate. No separate survey edition.
Also published as House doc. 14, 25th Cong., 2d sess. In v. 2.

1838

Report from the Secretary of the treasury, transmitting a report from the Superintendent of the coast survey, and of the fabrication of standards weights and measures, showing the progress in those works during the present year. [1838.] Blair & Rives, printers.

7 pp. 22cm. (Senate doc. 4, 25th Cong., 3d sess. In v. 1.)

F. R. Hassler, superintendent. Seventh report. Dated at "Springfield Mountain Station," Nov. 15, 1838.
No separate survey edition.
No House print found.

1839

Letter from the Secretary of the treasury, communicating the annual report of the Superintendent of the coast survey, and of the fabrication of standard weights and measures ["rendering account of the works of 1839"]. Blair & Rives, printers.

8 pp. 22cm. (Senate doc. 15, 26th Cong., 1st sess. In v. 2.)

F. R. Hassler, superintendent. Report signed at "Station of Willow Grove," Penna., Nov. 16, 1839.
500 additional copies printed. No separate survey edition.
Also published as House doc. 20, 26th Cong., 1st sess. In v. 2.

1840

Report from the Secretary of the treasury, transmitting a report of Professor F. R. Hassler, superintendent of the coast survey, and the fabrication of standard weights and measures, &c. ["rendering account of the works of 1840"].

18 pp. 22cm. (Senate doc. 20, 26th Cong., 2d sess. In v. 2.)

Report signed at "Station Mount Holly, N. J., Nov. 17, 1840."
300 additional copies printed for the Senate. No separate survey edition.
Also published as House doc. 14, 26th Cong., 2d sess.

1841

Letter from the Secretary of the treasury, transmitting a report of F. R. Hassler, superintendent of the coast survey, showing the progress made therein up to the present time [December, 1841].

18 pp. 22cm. (House doc. 28, 27th Cong., 2d sess. In v. 2.)

Includes "Questions of the resolution of Congress of June 24, 1841, relating to the survey of the coast of the United States, with the answers to the same by F. R. Hassler." Also contains a "List of instruments." This progress report is also the 10th annual report.
Report signed at "Station Yards in Newton Square, Delaware County (Pa.), December 2, 1841."
No separate survey edition.
No Senate print found.

1842

Report from the Secretary of the treasury, communicating a report from the Superintendent of the coast survey, and of the fabrication of standard weights and measures [upon the progress of these works in 1842]. Thomas Allen, print. [Washington, D. C. ?]

5 pp. 22cm. (Senate doc. 11, 27th Cong., 3d sess. In v. 2.)

F. R. Hassler, superintendent. Report signed at "Pine Hill Station, New Jersey, Nov. 17, 1842."
No separate survey edition.
Also published as House doc. 23, 27th Cong., 3d sess. In v. 2.

1843

Letter from the Secretary of the treasury, transmitting a report of the late F. R. Hassler, relative to the operations and condition of the Coast survey [in 1843]. Blair and Rives, printers.

8 pp. 22cm. (House doc. 97, 28th Cong., 1st sess. In v. 4.)

Twelfth and last report of Superintendent Hassler, who died Nov. 20, 1843. Report is signed at "Station Bethel, Pennsylvania, November 12, 1843."
Transmitted by the Secretary of the treasury, Jan. 29, 1844.
No separate survey edition.

1844

Report of the Secretary of the treasury, communicating a report of the Superintendent of the survey of the coast, showing the progress of the work during the year ending November, 1844. Blair & Rives, print.

22 pp. 4 maps and sketches. 22cm. (Senate doc. 16, 28th Cong., 2d sess. In v. 2.)

A. D. Bache, superintendent. Report dated at "Station near Cumberland Hill, R. I., November, 1844."
300* additional copies printed for use of survey. No separate survey edition.
Also published as House doc. 25, 28th Cong., 2d sess. In v. 2.

1845

Report from the Secretary of the treasury, communicating a report of the Superintendent of the coast survey, showing the progress of the work under his charge during the year ending November, 1845. Ritchie & Heiss, printers. [Washington, D. C.?]

44 pp. 3 maps and sketches. 22cm. (Senate doc. 13, 29th Cong., 1st sess. In v. 3.)

A. D. Bache, superintendent. Report dated at "Bodies island, N. C., November 29, 1845."
250* additional copies printed for use of the survey. No separate survey edition.
Also published as House doc. 38, 29th Cong., 1st sess. In v. 3.

APPENDICES.

*1, 2. [Miscellaneous correspondence.] pp. 40, 41.

*3. Extract from a letter addressed by Ferd. H. Gerdes, assistant United States Coast survey, to Prof. A. D. Bache, superintendent, containing remarks upon the currents in Mississippi sound, and upon the change in the magnetic variation within short distances in the Gulf of Mexico. pp. 41–43.

*4. [Letter. Commerce of Vineyard Sound.] pp. 43, 44.

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*Exhausted.

1846

Report of the Secretary of the treasury, communicating a report of the Superintendent of the coast survey, showing the progress of the survey during the year ending November, 1846. Ritchie & Heiss, print.

74 pp. 8 maps and sketches, 1 diag. 22cm. (Senate doc. 3, 29th Cong., 2d sess. In v. 2.)

A. D. Bache, superintendent. Report dated at "Cape Ann, Mass., November 25, 1846."
500 additional copies printed, of which 250* for use of the survey. No separate survey edition.
Also published as House doc. 6, 29th Cong., 2d sess. In v. 2.

APPENDICES.

*1–3. [Miscellaneous correspondence.] pp. 44–46.

*4. Letters of Lieutenant Commanding George M. Bache, U. S. Navy, assistant in the Coast survey, to the Superintendent, relating to the exploration of the Gulf stream. pp. 46–53.

*5–7. [Loss of brig Washington.] pp. 53–68.

*8. Letter from Lieut. Com. Patterson, United States Navy, to the Superintendent of the United States coast survey, relating to the tides at the entrance of Mobile bay. pp. 68–70.

*9. [Extract from letter. Life saving incident.] pp. 70, 71.

*10. Report of S. C. Walker, esq., to the Superintendent of the coast survey, in relation to the differences of longitude of Philadelphia and Greenwich, by reduction of observations at Cambridge, Massachusetts. pp. 71, 72.

Reprinted. Rept. 1866, app. 12, pp. 99, 100.

*11. Report of S. C. Walker, esq., to the Superintendent of the coast survey, relating to determinations of differences of longitude by telegraph, etc. pp. 72–74.

On correction for personal equation.
Reprinted. Rept. 1866, app. 13, pp. 100–102. Compare his report on telegraphic longitudes 1848 printed as 13-p. report in 30th Cong., 2d sess., House ex. doc. 21. Also his report dated Nov. 10, 1847, on the same subject printed in Astronomische nachrichten, nr. 632, pp. 119–126.

1847

Letter from the acting Secretary of the treasury, communicating the report of the Superintendent of the coast survey, showing the progress of that work ["during the year ending October, 1847"].

88 pp. 11 maps and sketches, 1 diag. 22cm. (Senate ex. doc. 6, 30th Cong., 1st sess. In v. 3.)

A. D. Bache, superintendent. Report dated at "Agamenticus station, near South Berwick, Maine, November 1, 1847."
1,250 additional copies printed, of which 250* for Superintendent Coast survey. No separate survey edition.

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*1–18. [Miscellaneous details.] pp. 60–86.

*11. Table showing temperatures at depths below 700 fathoms, taken by Lieut. Com. C. H. Davis in 1845, George M. Bache in 1846, and S. P. Lee in 1847.

See sketch, p. 75.

1848

Report of the Secretary of the treasury, communicating a report of the Superintendent of the coast survey, showing the progress of that work during the year ending November, 1848.

120 pp. 12 maps and sketches, 4 diag. 22cm. (Senate ex. doc. 1, 30th Cong., 2d sess. In v. 1.)

A. D. Bache, superintendent. Report dated at "Bodies island, North Carolina, November 14, 1848."
2,000 additional copies printed, of which 250* for Superintendent of the coast survey. No separate survey edition.
Also published as House ex. doc. 13, 30th Cong., 2d sess. In v. 4.

APPENDICES.

*1–3 bis. [Miscellaneous details.] pp. 70–76.

*4. Recapitulation of results for personal equations, 1844 to 1848, in the order of dates. Extract of report of S. C. Walker. pp. 77–83.

*5–18. [Light-house matters, etc.] pp. 84–112.

*19. Annual report to the Superintendent on longitude computations, by S. C. Walker, assistant United States Coast survey. pp. 112–118.

Reprinted. Rept. 1866, app. 14, pp. 102–105.

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* Exhausted.

1849

Letter from the Secretary of the treasury, communicating the report of the Superintendent of the coast survey, showing the progress of that work during the year ending November, 1849.

98 pp. 15 maps and sketches, 2 diag. 22cm. (Senate ex. doc. 5, 31st Cong., 1st sess. In v. 5.)

A. D. Bache, superintendent. Report dated at "Mount Independence, near Portland, Maine, October, 1849."

5,500 copies printed, of which 500* for Superintendent of coast survey. No separate survey edition.

Also published as House ex. doc. 14, 31st Cong., 1st sess. In v. 4.

APPENDICES.

*1–4. [Field and office details.] pp. 63–72.

*5. Report of Professor O. M. Mitchel, of Cincinnati, on the mechanical record of astronomical observations. pp. 72–78.

CONTENTS.—Revolving disk; arrangement for recording differences of declination.

*6–19. [Miscellaneous details, light-house matters, etc.] pp. 78–96.

*20. Description of a float for observations of surface currents, by Lieutenant C. P. Patterson, United States Navy, assistant in the Coast survey. p. 97.

See sketch H bis, current float.

1850

Letter from the Secretary of the treasury, transmitting the report of the Superintendent of the coast survey, showing the progress of that work during the year ending November, 1850.

134 pp. 27 maps and sketches. 22cm. (House ex. doc. 12, 31st Cong., 2d sess. In v. 4.)

No separate survey edition.

A. D. Bache, superintendent. Report dated at "Webb's station, Anne Arundel county, Md., November, 1850."

Also published as Senate ex. doc. 7, 31st Cong., 2d sess. In v. 4.

APPENDICES.

*1–12. [Miscellaneous details and correspondence.] pp. 64–85.

*6. Extract from the report of W. C. Bond, esq., director of the Cambridge observatory, to the Superintendent of the coast survey, in relation to the difference of longitude between Cambridge and Liverpool observatories. p. 79.

*8. Extracts from the report of Professor A. G. Pendleton, United States Navy, assistant in the Coast survey, to the Superintendent, in regard to the encroachment of the sea on land on the south side of Long Island. pp. 80–81.

*9. Report of H. L. Whiting, esq., assistant United States Coast survey, to the Superintendent, on the progress of Sandy Hook, from 1848 to 1850. pp. 81, 82.

See sketch 8 B, no. 4, 1851.

*13. Extract from the report of S. C. Walker, esq., assistant United States Coast survey, to the Superintendent, on the telegraphic operations and the computations in his charge. pp. 85–89.

CONTENTS.—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.

Reprinted. Rept. 1866, app. 15, pp. 106–108.

*14–22. [Field and office details.] pp. 89–105.

*23. Extract from the report of Assistant F. H. Gerdes to the Superintendent of the coast survey, on the reconnaissance of the Florida Keys, etc. pp. 106–110.

*24–30. [Field and office details.] pp. 110–134.

*31. Report accompanying a reconnaissance chart of the western coast of the United States, from Monterey, California, to the mouth of the Columbia river, Oregon, by Lieutenant Commanding W. P. McArthur, United States Navy, assistant in the Coast survey. pp. 119–122.

1851

Annual report of the Superintendent of the coast survey, showing the progress of that work during the year ending November, 1851. Washington: Robert Armstrong, printer. 1852.

v, 559 pp. 22cm. Accompanying sketches bound separately with title page index. 58 sheets, folded 30cm.

A. D. Bache, superintendent. Report dated at "Cape Small Point, Maine, November 5, 1851."

First report issued separately as a Survey publication.

Also published as Senate ex. doc. 3, 32d Cong., 1st sess. In v. 5 and v. 5a. Also as House ex. doc. 26, 32d Cong., 2d sess. In v. 4 and v. 4a.

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*Exhausted.

APPENDICES.

*Exhausted.

*55. Report to the Assistant in charge of the Coast survey office on the electrotyping operations of the Coast survey, by George Mathiot, electrotypist. pp. 541–553.

CONTENTS.—Adhesion of deposit to matrix; actions in the electrolytic solution; laboratory apparatus; manipulation.
Sketch 58.
Reprinted. Rept. 1866, app. 20, pp. 130–138.

*56. Report of Lieutenant Washington A. Bartlett, U. S. N., assistant in the Coast survey, to the Superintendent, on the examination of the reefs in Hell Gate channel and changes produced by blasting. pp. 553–558.

Errata, p. ix.

1852

Report of the Superintendent of the coast survey, showing the progress of the survey during the year 1852. Washington: Robert Armstrong, public printer. 1853.

vi, 173 pp. 36 maps and sketches, 1 diag. 30cm.

A. D. Bache, superintendent. Report dated at "Coast survey office (Washington), February 7, 1853."
Also published as Senate ex. doc. 58, 32d Cong., 2d sess. In v. 11. Also as House ex. doc. 64, 32d Cong., 2d sess. In v. 8.

APPENDICES.

*1–7. General lists, etc., Coast survey reports and correspondence. pp. 71–111.

*8. Report of Lieut. Washington A. Bartlett, U. S. Navy, assistant in Coast survey, to the Superintendent, on the examination of Pot rock, Hell Gate channel, New York. p. 84.

*9–11. [Reports on discoveries.] pp. 85–87.

*12. Extracts from the report of Assistant F. H. Gerdes, to the Superintendent, of a reconnaissance from the Suwanee river, Florida, to the mouths of the Mississippi, Louisiana. pp. 87–94.

*13. [Report on discoveries.] pp. 95–97.

*14. Extracts from the report of Lieut. James Totten, U. S. Army, assistant in Coast survey, to the Superintendent, on the placing of screw-pile signals along the Florida reef. pp. 97, 98.

*15–17. [Reports on discoveries and field work.] pp. 99–103.

*18. Report of Lieut. Comg. James Alden, U. S. Navy, assistant in the Coast survey, to the Superintendent, on the reconnaissance of the Western coast from San Francisco, south, to San Diego, including the Santa Barbara islands and channel. pp. 104–107.

*19, 20. [Reports on discoveries and field work.] pp. 107–108.

*21. Extracts from the report of Major I. I. Stevens, U. S. Corps of engineers, Assistant in charge of the Coast survey office, to the Superintendent, upon the subject of printing from lithographic transfers. pp. 108–111.

*22. Additional notes of a discussion of tidal observations made in connexion with the Coast survey at Cat island, in the Gulf of Mexico, by Professor A. D. Bache, superintendent U. S. Coast survey. pp. 111–122.

CONTENTS.—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.

*23–32. [Miscellaneous matters.] pp. 122–133.

*33–52. [Light-house matters.] pp. 133–167.

1853

Report of the Superintendent of the coast survey, showing the progress of the Survey during the year 1853. Washington: Robert Armstrong, public printer. 1854.

iv, 87, 186 pp. 49 maps and sketches, 5 diag. 30cm.

A. D. Bache, superintendent. Report dated at "Mt. Blue station, Franklin county, Maine, November 27, 1853."
Also published as Senate ex. doc. 14, 33d Cong., 1st sess. In v. 13. Also as House ex. doc. 12, 33d Cong., 1st sess. In v. 4.

*Exhausted.

APPENDICES.

* Exhausted.

1854

Report of the Superintendent of the coast survey, showing the progress of the Survey during the year 1854.* Washington: A. O. P. Nicholson, public printer. 1855.

xii, 92, 288 pp. 3 fig., 51 maps and sketches, 7 diag. 30cm.

A. D. Bache, superintendent. Report dated at "Ragged Mt. station, near Camden, Maine, November 22, 1854."

Also published as Senate ex. doc. 10, 33d Cong., 2d sess. In v. 12. Also as House ex. doc. 20, 33d Cong., 2d sess. In v. 6.

APPENDICES.

*1–13. [Miscellaneous details.] pp. 1–20.

*14. Report of Lieut. Comg. J. N. Maffitt, U. S. N., assistant in the Coast survey, on Beaufort harbor, North Carolina, communicated, by request, to the honorable Secretary of the navy June 12, 1854. pp. 21–23.

Its capacity, changes, and improvements.
Sketch 23.

*15–18. [Letters in regard to hydrographic discoveries, etc.] pp. 23–25.

*19. Letter from the Superintendent of the coast survey to the Commissioner of the general land office, communicating the results of the survey of Florida keys, in the vicinity of Key West and Spanish harbor. pp. 25–27.

*20. Extracts from the report of F. H. Gerdes, esq., assistant United States Coast survey, on the reconnaissance of the coast of Louisiana in 1854. pp. 28–30.

Particularly the Mississippi delta.

*21. Extracts from report of Assistant 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]. pp. 30–31.

*22–28. [Letters in regard to sailing directions, etc.] pp. 31–35.

*29. Extracts from the reports of Assistant G. A. Fairfield and Subassistant Henry Mitchell on the tidal observations made on the south shore of Massachusetts, and in Nantucket and Vineyard sounds. pp. 35–37.

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*31. Reports of the chiefs of divisions [including] report of Mr. George Mathiot, in charge of the electrotype division [on electrotype operations and chemiglyphic or etching experiments]. pp. 40–61.

*32. Description of the Congress map, by Lieut. J. C. Tidball, U. S. A., assistant in Coast survey. pp. 61–63.

Reprinted. Rept. 1855, app. 39.

*33. Comparison of the reduction of horizontal angles by the methods of dependent directions and of dependent angular quantities, by the method of least squares. By Prof. A. D. Bache. pp. 63–70.

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*35. Description of the United States Coast survey apparatus for measuring base lines. By Lieut. E. B. Hunt, U. S. A., and assistant United States Coast survey. Communicated to the American association for the advancement of science, by authority of the Treasury department. pp. 103–108.

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*36. Letter of Professor Peirce, of Harvard, to the Superintendent of the coast survey, enclosing his report on longitude by moon culminations. pp. 108–120.

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*37. Report of Professor W. C. Bond on moon culminations, observed by him during the past year, by the "American method." p. 120.

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*38. Report of Professor E. Otis Kendall on the number of moon culminations, etc., observed at the High School observatory, Philadelphia. p. 120.

*39. Discussion by J. E. Hilgard, esq., of the probable error of observation with a twenty-six inch portable transit by Würdemann, from observations of Assistant G. Davidson, in 1853. p. 121.

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*40. Observations on the solar eclipse of May 26, 1854, reported to the Superintendent of the coast survey. pp. 122–127.

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*41. Report of Dr. B. A. Gould, jr., assistant in the Coast survey, upon telegraphic observations made for difference of longitude between Raleigh, N. C., and Columbia, S. C. pp. 128–131.

*41 [a]. Report to Professor A. D. Bache, LL. D., superintendent of the U. S. Coast survey, containing directions and tables for the use of Peirce's criterion for the rejection of doubtful observations: by Dr. B. A. Gould, jr. pp. 131–138.

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*43. Table of magnetic declination. pp. 142–145.

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*44. Extracts from reports of Assistant George W. Dean on the establishment of meridian lines at Petersburg, Va., and Raleigh and Wilmington, N. C. p. 146.

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*47. On the distribution of temperature in and near the Gulf stream, off the coast of the United States, from observations made in the Coast survey. By A. D. Bache, superintendent. (Communicated to the American association for the advancement of science, by authority of the Treasury department.) pp. 156–161.

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*50. Report on the tidal currents of Long Island sound and approaches: by Charles A. Schott. pp. 168–179.

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*52. [Cards from current bottles.] pp. 189, 190.

*53. Description of a tide-gauge used at stations on the open seacoast, and in situations exposed to strong currents: By Henry Mitchell, subassistant U. S. Coast survey. pp. 190, 191.
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*54. Letter from Lieutenant Commanding T. A. Craven, U. S. N., assistant in the Coast survey, to the Superintendent, in relation to a specimen-box for bringing up the bottom in deep-sea soundings, with a description and drawings. pp. 191, 192.
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*56. Letter from George Mathiot, esq., containing a detailed description of his self-sustaining voltaic battery. pp. 193, 201.
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*57. Report on engraving in relation to the Coast survey. By Lieutenant E. B. Hunt, Corps of engineers U. S. Army, and assistant U. S. Coast survey. pp. 201–212.
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*58–73. [Miscellaneous correspondence and light-house matters.] pp. 212–229.

1855

Report of the Superintendent of the coast survey, showing the progress of the Survey during the year 1855.* Washington: Cornelius Wendell, printer. 1856.

xx, 420 pp. 1 fig., 54 maps and sketches, 6 diag. 30cm.
A. D. Bache, superintendent. Report dated at "Mount Harris station, near Dixmont, Penobscot county, Maine, October 23, 1855."
Also published as Senate ex. doc. 22, 34th Cong., 1st sess. In v. 17. Also as House ex. doc. 6, 34th Cong., 1st sess. In v. 3.

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*29. Letter of Commander James Alden, U. S. N., assistant in the Coast survey, communicating information relative to the coast, harbors, and commerce of Washington territory. pp. 188–192.

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*32. [Report of field and office work.] pp. 220–222.

*33. Report of Subassistant H. Mitchell, on tidal observations made in Nantucket sound. pp. 222, 223.
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*34. Report of Lieutenant W. P. Trowbridge, U. S. Engineers, assistant in the Coast survey, relative to the tidal and magnetic operations by the party under his charge on the western coast. pp. 223–227.

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*39. Description of the Congress map, by Lieut. J. C. Tidball, U. S. A., assistant in the Coast survey. pp. 253–255.
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*40. Solutions of normal equations by indirect elimination. By Chas. A. Schott, computing division. pp. 255–264.

*41. Letter to the Superintendent from Assistant C. O. Boutelle, with description of the apparatus devised for the measurement of preliminary bases at Savannah, Georgia, and Georgetown, South Carolina. pp. 264–267.
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*42. Report of the method of determining longitudes by occultations of the Pleiades. By Professor Benjamin Peirce, LL. D., of Harvard. pp. 267–274.
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*43. Report of Professor W. C. Bond, on the number of moon culminations observed at Cambridge, Mass., and relative to the chronometer expedition for difference of longitude between Cambridge and Liverpool. pp. 275, 276.
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*44. Letter to the Superintendent from Assistant George W. Dean, communicating description of the zenith telescope made by Mr. Wm. Würdemann, 1855, and used at the astronomical station, Dixmont, Maine. pp. 276–278.

*45. Report of Mr. Charles A. Schott, computing division, Coast survey office, on a comparison of star-places given in Rümker's and the Twelve-year catalogues. (Communicated to the Astronomical journal by authority of the Treasury department.) pp. 278–286.
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*46. Report of Dr. B. A. Gould, jr., assistant, on telegraphic operations for difference of longitude between Columbia, South Carolina, and Macon, Georgia. pp. 286–295.
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Errata, p. 288: 1855, p. xviii.

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*47. Table of magnetic declinations, observed in the Coast survey, with notes by A. D. Bache, superintendent of the coast survey, and J. E. Hilgard, assistant, accompanied by a map. pp. 295–306.

Discussion of magnetic declination for 1844–45: (1) Northern part of the Gulf of Mexico; (2) Atlantic coast; (3) Pacific coast.
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*48. Report to the Superintendent of the U. S. coast survey of a discussion of the secular variation in the magnetic declination on the Atlantic and part of the Gulf coast of the United States, by Charles A. Schott, chief of computing division, U. S. Coast survey office. (Communicated to the American association for the advancement of science, by authority of the Treasury department.) pp. 306–337.

Comprises the period from 1717–1855.
This (with supplements in Rept. 1856, app. 31, and Rept. 1859, app. 24) is the first of the following series of editions: Ed. 2, Rept. 1874, app. 8; ed. 3, Separate pub. (1879); ed. 4, Rept. 1879, app. 9; ed. 5, Rept. 1882, app. 12; ed. 6, Rept. 1886, app. 12; ed. 7, Rept. 1888, app. 7; ed. 8, Rept. 1895, app. 1.
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*49. Results of observations made by Chas. A. Schott, esq., computing division Coast survey office, for magnetic declination, dip, and horizontal intensity. p. 337.

At sixteen eastern stations, July to September, 1855.

*50. Approximate cotidal lines of the Pacific coast of the United States, from observations in the United States Coast survey, by A. D. Bache, superintendent. (Communicated to the American association for the advancement of science, under authority of the Treasury department.) pp. 338–342.

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*52. Notice of the tidal observations made on the coast of the United States on the Gulf of Mexico, and type curves at the several stations, showing their decomposition into the curves of diurnal and semidiurnal tides; by A. D. Bache, superintendent. (Communicated to the American association for the advancement of science, under authority of the Treasury department.) pp. 346, 347.

*53. Tide tables, for the use of navigators; prepared from the Coast survey observations by A. D. Bache, superintendent. (Prepared by authority of the Treasury department, for E. and G. W. Blunt, New York.) pp. 347–359.

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*54. Copy of card contained in a current-bottle thrown over near Sandy Hook, from the U. S. Coast survey steamer Gallatin, Lieut. Comg. M. Woodhull, and picked up on the bar at Santa Cruz, one of the western islands [of the Azores]. p. 359.

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*61. On a new voltaic experiment made with reference to the time required to produce the maximum intensity of a voltaic current; communicated to the Superintendent by George Mathiot, electrotypist. pp. 366–368.

*62. Letter of George Mathiot, esq., electrotypist Coast survey office, communicating an improved method for taking entire casts from detached plates by the electrotype process. p. 369.

A method for joining detached plates.

*63. On a method of measuring electrical currents of great quantity; by George Mathiot, esq., chief of the electrotype division of the Coast survey office. pp. 370–373.

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*64. 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 direction of the Superintendent, by J. G. Kohl. pp. 374, 375.

*65. Observations on the physical geography and geology of the coast of California, from Bodega bay to San Diego. (Prepared for Prof. A. D. Bache, superintendent of the United States coast survey, by William P. Blake.) pp. 376–398.

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*66. Explosion of boiler on steamer Hetzel. pp. 398–400.

*67–86. [Letters relating to discoveries and light-house matters.] pp. 400–416.

1856

Report of the Superintendent of the coast survey, showing the progress of the survey during the year 1856. Washington: A. O. P. Nicholson, printer. 1856.

xx, 358 pp. 2 figs., 58 maps and sketches, 9 diag. 30cm.

A. D. Bache, superintendent. Report dated at "Coast survey office, Washington, D. C., December, 1, 1856."

Also published as Senate ex. doc. 12, 34th Cong., 3d sess. In v. 15. Also as House ex. doc. 18, 34th Cong., 3d sess. In v. 4.

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*19. [Reports on office work.] pp. 137–163.

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*25. Report to the Superintendent of the coast survey, by Dr. C. H. F. Peters, on the method of substituting a lunar spot instead of the moon's limb, in transits for determining the difference of longitude. pp. 198–203.

*26. Report of Assistant George Davidson upon observed occultations of α Scorpii and of the planet Mars, at Point Hudson, Port Townshend, Washington territory, in April and May, 1856. pp. 203–208.

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*27. Method of observing azimuth employed at Cat Island, by J. E. Hilgard, assistant U. S. Coast survey. pp. 208, 209.

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*29. Report of Assistant Charles A. Schott, on magnetic observations made at stations in Delaware, Maryland, and Virginia. pp. 226, 227.

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*30. Results of observations made by Assistant Charles A. Schott, computing division, Coast survey office, for magnetic declination, dip, and horizontal intensity, in Section III, 1856. p. 227.

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*31. An attempt to determine the secular change of the magnetic declination on the western coast of the United States: by Chas. A. Schott, in charge of the computing division, Coast survey office. pp. 228–235.

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Considered a supplement to Rept. 1855, app. 48.

*32. Discussion of the secular variation of the magnetic inclination in the northeastern states: by Chas. A. Schott, in charge of the computing division, Coast survey office. pp. 235–245.

CONTENTS.—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.
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*33. An attempt to determine the secular variation of the magnetic inclination on the western coast of the United States, by Chas. A. Schott, in charge of computing division, Coast survey office. pp. 246–249.

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*34. Notes on the progress made in the Coast survey, in prediction tables for the tides of the United States coast, by A. D. Bache, superintendent United States Coast survey, etc. (Communicated to the American association for the advancement of science, by authority of the Treasury department.) pp. 249–251.

*35. Approximate co-tidal lines of diurnal and semidiurnal tides of the coast of the United States on the Gulf of Mexico, by A. D. Bache, superintendent United States Coast survey. (Communicated by authority of the Treasury department to the American association for the advancement of science.) pp. 252–260.

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*36. Description of the type-curves in the Gulf of Mexico. pp. 260, 261.

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*37. Report of Subassistant H. Mitchell on the progress of the discussion of the interference tides of Nantucket and Martha's Vineyard sound. pp. 261–263.

Errata, p. 264: 1856, p. xx.

*38. Observations to determine the cause of the increase of Sandy Hook, made by the Coast survey, for the Commissioners on harbor encroachments of New York,—by Professor A. D. Bache, superintendent United States coast survey. pp. 263, 264.

With reference to tidal currents.

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*Exhausted.

*39. Report of Subassistant H. Mitchell on the investigation of the tides and tidal currents of New York harbor and its dependencies, and at Sandy Hook. pp. 264–266.

*40. Report of G. Würdemann on tidal observations made at stations between New York city and Albany, on Hudson river. pp. 266, 267.
Sketch 6.

*41. [Report on tidal work.] pp. 267–269.

*42. Report of Lieutenant W. P. Trowbridge, U. S. Engineers, assistant in the Coast survey, on the method pursued in conducting tidal observations on the western coast of the United States. pp. 269, 270.

*43. On the effect of winds in varying the level of the water in Albemarle sound, by L. F. Pourtales, assistant in the Coast survey. pp. 271, 272.
Discussion of their effect upon the tides.
1 diag.

*44. Notes on the winds of the coast of the United States on the Gulf of Mexico, by A. D. Bache, superintendent United States Coast survey. pp. 272–276.
CONTENTS.—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.
1 diag.

*45. Notes on the effect of the wind upon the height of water in Cat island harbor, Mississippi, by Geo. W. Dean, assistant United States Coast survey, under the immediate direction of Prof. A. D. Bache, superintendent. pp. 276–278.
Sketch 39.

*46. Copy of card taken from a current bottle thrown over from the United States surveying steamer Walker, south of Mississippi delta. pp. 279, 280.
Picked up on the shore of Loggerhead key, Fla., and on the North Caicos, Bahamas.

*47. Statement of the Superintendent to the Commissioners on harbor encroachments and resolution adopted by the board relative to the completion of the resurvey and maps of New York harbor and dependencies. pp. 280, 281.

*48. Report of Mr. A. Boschke, on the progress made in special topography in connection with maps of New York harbor, undertaken by the Coast survey for the Commissioners on harbor encroachments. pp. 281, 282.
Method of survey.

*49. Report of Lieut. Comg. Stephen D. Trenchard, U. S. N., assistant in the Coast survey, transmitting results of the hydrographic survey of St. Simons sound and Brunswick harbor, Ga. pp. 282, 283.

*50–51. [Reports on field work.] pp. 284–286.

*52. Report to the Commissioner of the general land office, showing the progress made during the season in the survey and marking of the Florida Keys. pp. 286–289.

*53–55. [Reports on Florida harbors, etc.] pp. 289–291.

*56. Extract from a report of Assistant J. E. Hilgard to the Superintendent on the progress of the triangulation in Mississippi sound and Lake Borgne. pp. 291, 292.
Description of the signals and station marks.

*57. Letter of Commander James Alden, U. S. N., assistant, Coast survey, transmitting a communication from H. A. Goldsborough, esq., in relation to the resources of Washington territory. pp. 293–295.

*58. Table for projecting maps of large extent, arranged by Assistant J. E. Hilgard. 296–307.
CONTENTS.—Method; earth's dimensions; Table I, of coordinates for projecting the points of intersection of meridians and parallels; II, length in metres, of one degree of latitude and longitude from latitude 20° to 54°; values of the corresponding radii of the developed parallel, and angles at each pole for 10° of longitude; III, tables for converting metres, miles, etc.; 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.

*59. Communication from Assistant Charles A. Schott, of the computing division, Coast survey office, on the determination of the probable error of an observation from the differences of the observations from their arithmetical mean. pp. 307, 308.
Article from Astronomische nachrichten, nr. 1034, translated by C. A. Schott.

*60. Description of an apparatus for measuring subsidiary base-lines. pp. 308–310.
Description of a modification devised for ascertaining the temperature of rods in use.
Sketch 64.

*61. Method of testing a repeating theodolite, illustrated by Assistant J. E. Hilgard. pp. 310–316.
CONTENTS.—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.

*Exhausted.

*62. Report of George Mathiot, on the results of an experiment made in printing maps from their electrotyped plates. pp. 316, 317.
Results of experiments made in printing from thin plates.

*63. Letter to the Superintendent, communicating results of analysis made of specimens of the water of New York harbor, by Professor Wolcott Gibbs. pp. 317, 318.

*64. Letter to the Superintendent from Professor Wolcott Gibbs, communicating results of examinations made of sands taken from the sites of Coast survey bases at Key Biscayne (Cape Florida) and Cape Sable. pp. 318, 319.

*65. Abstract of an historical memoir concerning the progress of exploration on the Atlantic coast of the United States, from its discovery to the present time. (Prepared by Dr. J. G. Kohl, for the archives of the U. S. Coast survey.) pp. 319–322.

*66. Abstract of an historical account of explorations made on the coast of the Gulf of Mexico, from the earliest times to the present. (Prepared for the archives of the United States Coast survey, by Dr. J. G. Kohl.) pp. 322–324.

*67. Report on an index of reference to memoirs of papers on subjects related to the Coast survey operations, by Lieut. E. B. Hunt, U. S. Corps of engineers, assistant U. S. Coast survey. pp. 325–330.

*68. On systematizing the abbreviations of titles of periodicals, transactions, etc., by Lieutenant E. B. Hunt, U. S. Corps of engineers. 331–333.

*69–77. [Miscellaneous correspondence.] pp. 333–348.

*78–86. [Light-house matters.] pp. 349–356.

1857

Report of the Superintendent of the coast survey, showing the progress of the survey during the year 1857.* Washington: James B. Steedman, printer. 1858.
xviii, 448 pp. 1 fig., 62 maps and sketches, 8 diag. 30cm.
A. D. Bache, superintendent. Report dated at "Coast survey office, Bangor, Maine, November 3, 1857." Also published as Senate ex. doc. 33, 35th Cong., 1st sess. In v. 15. Also as House ex. doc. 21, 35th Cong., 1st sess. In v. 6.

APPENDICES.

*1–12. [Field and office details.] pp. 121–150.
1 fig.

*13. Report of Lieutenant Commanding W. G. Temple, U. S. N., assistant Coast survey, stating the results of an examination made to determine the least water on the rocks at Hell Gate, East river, New York. pp. 150, 151.
Method of sweeping.

*14, 15. [Field and office details.] pp. 151, 152.

*16. Extracts from the report of Lieutenant Commanding C. R. P. Rodgers, U. S. N., assistant in the Coast survey, showing the results of a resurvey of the bar and anchorage at Beaufort, N. C. pp. 152, 153.
Sketches 29 and 30.

*17. Report of Lieutenant Commanding J. N. Maffitt, U. S. N., assistant Coast survey, showing the result of a re-examination of the bars and entrances to Cape Fear river, North Carolina. pp. 153–156.
Elements of physical changes wrought.
Sketch 33; also 1855, sketch 16.

*18, 19. [Field and office details.] pp. 156, 1

*20. Tide tables. For the use of navigators, prepared from the Coast survey observations, by A. D. Bache, superintendent. (Furnished, by authority of the Treasury department, to E. & G. W. Blunt, New York, and revised January, 1857.) pp. 157–178.
1 fig.

*21. Report made to the Superintendent, showing the least water in channel entrances to certain harbors, rivers, and anchorages on the coasts of the United States; prepared by Lieut. W. D. Whiting, and revised by Lieutenants Commanding J. J. Almy and T. A. Craven, U. S. N., assistants in the Coast survey. Tidal data by Assistant L. F. Pourtales, in charge of tidal division. pp. 178–184.

*22. [Reports on office work.] pp. 185–223.

*23. List of original topographical sheets registered in the archives of the United States Coast survey, geographically arranged. pp. 223–244.

*24. List of original hydrographic sheets, registered in the archives of the United States Coast survey, geographically arranged. pp. 245–264.

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*Exhausted.

* Exhausted.

*39. Report made by Lieutenant A. W. Evans, U. S. A., assistant, Coast survey, on a topographical reconnaissance of a part of Sapelo island, Georgia, for the selection of a site for a primary base line. pp. 374–377.

*40. [Reports on field work, Georgia and Florida.] pp. 377–379.

*41. Report of Capt. J. H. Simpson, U. S. Topographical engineers, assistant in the Coast survey, on the reconnaissance and progress made in triangulation for an air line between Fernandina and Cedar Keys, Florida. pp. 379–382.

*42. Report to the Commissioner of the general land office, showing the progress made in the survey and marking of the Florida keys, in quarter sections, during the present season. pp. 382–390.

*43. Extract from the report of Subassistant W. M. Johnson, on the topographical features of the coast adjacent to Santa Barbara channel, California. pp. 390, 391.

*44. Report of Assistant W. E. Greenwell, on the survey, character, and resources of the islands and main adjacent to Santa Barabara channel, California. pp. 392–395.

*45. Description of an apparatus for measuring subsidiary base lines. pp. 395–398.
Sketch 69.
Reprinted separately in 1876, but without appendix number.

*46. Description of deep-sea sounding apparatus invented by Commander B. F. Sands, U. S. N., assistant in the Coast survey. p. 398.
1 diag.

*47. Notes by Lieutenant E. B. Hunt on a new sounding apparatus proposed by him for Coast survey use. pp. 398–401.
For sounding in moderate depths.

*48. Report of Lieutenant Commanding W. G. Temple, United States Navy, assistant Coast survey, on the result of trials made with the new sounding apparatus devised by Lieutenant E. B. Hunt, United States Engineers. pp. 401, 402.

*49. Description of the tide-gauge devised by Lieutenant Commanding S. D. Trenchard, U. S. N., assistant in the Coast survey. pp. 402, 403.
Sketch 72.

*50. Letter from the Superintendent, communicating the description of a tide-gauge devised by Subassistant H. Mitchell for taking observations in deep water. pp. 403, 404.
Sketch 72.

*51. Report of Lieutenant E. B. Hunt, U. S. Engineers, assistant in the Coast survey, on the preparation of an index of scientific references. pp. 404–414.

*52. Report of J. G. Kohl, esq., on the method, scope, and completion of a history of maritime discovery and exploration on the western coast of the United States, prepared for publication with the records of the United States Coast survey. pp. 414–433.

*53, 54. [Miscellaneous correspondence.] pp. 434–437.

*55–65. [Light-house matters.] pp. 438–445.

1858

Report of the Superintendent of the coast survey, showing the progress of the Survey during the year 1858.* Washington: William A. Harris, printer. 1859.
xxi, 463 pp. 2 fig., 39 maps and sketches, 1 diag. 30cm.
A. D. Bache, superintendent. Report dated at "Superintendent's office, Cheshire, Conn., October 28, 1858."
Also published as Senate ex. doc. 14, 35th Cong., 2d sess. In v. 16. Also as House ex. doc. 33, 35th Cong., 2d sess. In v. 6.

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*1–12. [Field and office details.] pp. 121–150.

*13. Report of Lieut. Comg. T. B. Huger, U. S. N., assistant in the Coast survey, showing the result of comparisons of the hydrographic surveys made in December, 1856, and March, 1858, at the entrances to Cape Fear river, N. C. pp. 150, 151.
Recent changes in hydrography.
Sketches 12 and 13.

*14–19. [Field and office details.] pp. 151–184.

*20. On a supposed personal equation in the use of the zenith telescope for determining latitudes by Talcott's method, by A. D. Bache, superintendent United States Coast survey. (Communicated by authority of the Treasury department to the American association for the advancement of science.) pp. 184–186.
Table showing results of observations for personal equations.

* Exhausted.

* Exhausted.

*43. Tide tables for the use of navigators, prepared from the Coast survey observations by A. D. Bache, superintendent. (Furnished by authority of the Treasury department to E. & G. W. Blunt, New York, and revised October, 1858.) pp. 275–297.
1 fig.

*44. Directory for the Pacific coast of the United States. By Assistant George Davidson. pp. 297–458.

*45–50. [Light-house matters.] pp. 459–463.

1859

Report of the Superintendent of the coast survey, showing the progress of the Survey during the year 1859. Washington: Thomas H. Ford, printer. 1860.
xvi, 370 pp. 1 fig., 35 maps and sketches, 4 diag. 30cm.
A. D. Bache, superintendent. Report dated at "Coast survey station, Cooper, Washington county, Maine, September 23, 1859."
Also published as House ex. doc. 41, 36th Cong., 1st sess. In v. 7.

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*1–13. [Field and office details.] pp. 108–136.
1 fig.

*14. Tide tables for the use of navigators, prepared from the Coast survey observations by A. D. Bache, superintendent. (Furnished by authority of the Treasury department to E. & G. W. Blunt, New York, and revised October, 1859.) pp. 136–167.
1 fig.
Errata, p. 145: 1860, p. xx.

*15. Table showing the least water in the channels of certain rivers, harbors, and anchorages on the coasts of the United States; reprinted from the list of 1857 and revised, with additions and tidal data. pp. 168–171.

*16. Table for navigators, showing the variation of the compass for the year 1858, compiled from the general chart of F. J. Evans, R. N. pp. 172–175.
Sketch 38.

*17. [Reports on office work.] pp. 176–212.

*18. List of registered topographical sheets received subsequent to 680. pp. 212–214.

*19. List of registered hydrographic sheets received subsequent to 632. pp. 215, 216.

*20. List of geographical positions determined by the United States Coast survey, and continued from reports of 1851, 1853, 1855, and 1857. pp. 216–277.

*21. [Letter on moon culminations, Cincinnati.] p. 278.

*22. Discussion of the magnetic and meteorological observations made at the Girard college observatory, Philadelphia, in 1840, 1841, 1842, 1843, 1844, and 1845. Part I. Investigation of the eleven-year period in the amplitude of the solar-diurnal variation, and of the disturbances of the magnetic declination. By A. D. Bache, LL. D. pp. 278–295.
CONTENTS.—Introduction; separation of disturbances and establishment of normal readings of the declinometer; analytical expressions of the regular solar-diurnal variation of the declination; inequality of the amplitude due to the eleven (or ten) year period; discussion of the number of disturbances of the declination—their annual inequality; diurnal inequality of the number of disturbances of the declination; deflections by disturbances—their mean annual amount—effect of the eleven (or ten) year period; deflections by disturbances—their mean diurnal amount; connection of the frequency of the solar spots with the changes in the amplitude of the diurnal variation of the declination.
1 diag.
Errata, pp. 279, 280, 293: 1860.
Also published in Smithsonian contributions to knowledge, v. 11, no. 113. This and other parts were also assembled and published by the Smithsonian institution in monographic form under the above series title.

*23. Results reported from the observations made by Assistant Charles A. Schott, for magnetic declination, dip, and horizontal intensity, in Sections I and II, and Canada, 1859. p. 296.
CONTENTS.—New England, New York, and Canada; results of observations made by him in Canada, Maine, New Hampshire, Vermont, Massachusetts, and Connecticut; footnote on disturbances.

*24. Report of Assistant Charles A. Schott on the latest results of the discussion of the secular change of the magnetic declination, accompanied by tables showing the declination (variation of the needle) for every tenth year from the date of the earliest reliable observation, for twenty-six stations on the Atlantic, Gulf, and Pacific coasts of the United States. pp. 296–305.
CONTENTS.—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.
Considered a supplement of ed. 1, Rept. 1855, app. 48, and Rept. 1856, app. 31. For ed. 2 see Rept. 1874, app. 8; ed. 3, Separate pubs. (1879); ed. 4, Rept. 1879, app. 9; ed. 5, Rept. 1882, app. 12; ed. 6, Rept. 1886, app. 12; ed. 7, Rept. 1888, app. 7; ed. 8, Rept. 1895, app. 1.

*Exhausted.

*25. Gulf stream explorations.—Third memoir: Distribution of temperature in the water of the Florida channel and straits: By A. D. Bache, supt. U. S. Coast survey. (Communicated by authority of the Treasury department to the American association for the advancement of science.) pp. 306–310.

CONTENTS.—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.

*26. Report of Assistant Henry Mitchell on the physical surveys of New York harbor and the coast of Long Island, with descriptions of apparatus for observing currents, etc. pp. 311–317.

Sketch 40.
Errata, p. 317: 1860, p. xx.

*27. [Report on office work.] pp. 317–320.

*28. Circulars found in current bottles thrown from the surveying steamer Corwin in 1857 and 1859, in the vicinity of the Florida reef. pp. 320, 321.

*29–31. [Report of explorations, South Carolina, Georgia, Florida.] pp. 321–324.

*32. Extracts from the report of Assistant S. A. Gilbert, descriptive of the coast of Texas intervening between Matagorda bay and Corpus Christi. pp. 324–328.

Report on a reconnaissance.

*33. Tables for projecting maps of large extent, arranged by J. E. Hilgard, U. S. C. S. pp. 328–358.

CONTENTS.—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, coordinates of curvature.

*34. Description of an apparatus devised by Assistant W. P. Trowbridge, and of the method of applying it in determining ocean depths and obtaining specimens of bottom. pp. 359–364.

Sketch 39.
Errata, p. 359: 1860, p. xx.

*35. Extracts from letters of J. M. Batchelder, esq., stating the results of trials made with Hunt's tide-metre at Charlestown navy yard, Mass. pp. 365, 366.

*36–39. [Miscellaneous correspondence.] pp. 367–369.

*40–43. [Light-house matters.] pp. 369, 370.

1860

Report of the Superintendent of the coast survey, showing the progress of the Survey during the year 1860. Washington: Government printing office. 1861.

xx, 409 pp. 1 fig., 22 maps and sketches, 8 diag. 30cm.

A. D. Bache, superintendent. Report dated at "Coast survey office, Washington, D. C., December 15, 1860."
Also published as House ex. doc. 14, 36th Cong., 2d sess. In v. 7.

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*1–15. [Field and office details.] pp. 105–131.

1 fig.

*16. Tide tables for the use of navigators, prepared from the Coast survey observations by A. D. Bache, superintendent. (Furnished by authority of the Treasury department to E. & G. W. Blunt, New York, and revised October, 1860.) pp. 131–164.

1 fig.
Errata, p. 161: 1860, p. xx.

*17. Lecture on the Gulf Stream, prepared at the request of the American association for the advancement of science. By A. D. Bache, superintendent U. S. Coast survey. pp. 165–176.

CONTENTS.—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.

*18. [Report on tidal work.] pp. 177–179.

*19. [Report on office work.] pp. 179–216.

*20. Reports of Assistant H. L. Whiting, on topographical contour, hydrographic details, and reduction, on photography, and on the scale of shades suitable for complete maps. pp. 216–229.

CONTENTS.—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.

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* Exhausted.

*21. A resolution providing for the observation of the eclipse of the sun on the 18th day of July, 1860. Report to the Superintendent of the United States coast survey on the expedition to Labrador to observe the total eclipse of July 18, 1860, organized under act of Congress approved June 15, 1860, by Professor Stephen Alexander, LL. D., of the College of New Jersey. pp. 229–275.

CONTENTS.—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; observations with Arago's polariscope; report of photographers; changes of illumination; seamen's observations; winds; magnetic elements; longitude by chronometers.

4 fig., sketch 39.

Errata, 239, 275: 1860, p. xx

*22. An account of the solar eclipse of July, 1860, as observed for the United States Coast survey near Steilacoom, Washington territory, by Lieut. J. M. Gilliss, U. S. Navy. pp. 275–292.

CONTENTS.—Preliminary; table of meteorological observations on Muck prairie; latitude observations; time observations; chronometer errors and rates; longitude; the eclipse; reports from special parties.

1 diag.

*23. Discussion of the magnetic and meteorological observations made at the Girard college observatory, Philadelphia, in 1840, 1841, 1842, 1843, 1844 and 1845. Part II.—Investigation of the solar-diurnal variation in the magnetic declination, and its annual inequality. By A. D. Bache, LL. D. pp. 293–312.

CONTENTS.—Investigation of the solar-diurnal variation of the declination; its semiannual inequality; analytical and graphical exhibition of the solar-diurnal variation for each month, summer, winter, and year; maxima and minima, and times of average value of the declination; diurnal range; annual variation of the declination.

1 diag.

Also published in Smithsonian contributions to knowledge, v. 13, no. 121. This and the other parts were also assembled and published by the Smithsonian institution in monographic form under the above series title.

*24. Discussion of the magnetic and meteorological observations made at the Girard college observatory, Philadelphia, in 1840, 1841, 1842, 1843, 1844, and 1845. Part III.—Investigation of the influence of the moon on the magnetic declination. By A. D. Bache, LL. D. pp. 312–324.

CONTENTS.—Lunar influence on the magnetic declination; tabulation of results according to the moon's hour angle; comparison of lunar-diurnal variation for three epochs; resulting lunar-diurnal variation; inequality in the lunar-diurnal variation; investigation of deflections depending upon lunar phases; variation in declination and in parallax.

1 diag.

Also published in Smithsonian contributions to knowledge, v. 13, no. 132.

*25. Results of observations made on solar spots during the first seven months of the year 1860, by C. A. Schott, assistant in the Coast survey. pp. 324–326.

*26. Report on the magnetic station at Key West, Florida reef, by Prof. W. P. Trowbridge, assistant Coast survey. pp. 326–349.

CONTENTS.—Description of observatory, with results; 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.

*27. Description of the magnetic station at Eastport, Maine, by Assistant L. F. Pourtales. pp. 350, 351.

*28. Continuation of the list of magnetic stations and results given in appendices 28, Coast survey report of 1856, and 24, Coast survey report of 1858. pp. 351, 352.

Declination, dip, and intensity at various stations. (Supplementary to 1856, p. 227, and 1858, p. 191.)

*29. Results reported from the observations made by Assistant Charles A. Schott, for magnetic declination, dip and horizontal intensity, on Cape Cod peninsula, Long Island, and the coast of New Jersey. p. 352.

*30–34. [Reports on field work. Florida and Texas.] pp. 353–357.

*35. Supplement to appendix 61 in C. S. report for 1856, on the "Method of testing a repeating theodolite." pp. 357–361.

CONTENTS.—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.

*36. Formulæ, tables, and example for the geodetic computation of latitudes, longitudes, and azimuths of trigonometrical points, as used by the United States Coast survey. pp. 361–391.

Tables for each minute of latitude from 23° to 50°.

*37. Account of Cauchy's interpolation formula. Prepared by Charles A. Schott, assistant Coast survey. pp. 392–396.

*38. Table showing the 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 the plane-table. Prepared by Charles A. Schott, assistant United States Coast survey. p. 397.

CONTENTS.—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.

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* Exhausted.

*39. Description of implements devised by Assistant Henry Mitchell for collecting specimens of bottom in alluvial harbors. p. 398.
Sketch 40.

*40. Description of the method of applying a new form of dividers invented by Mr. John R. Gilliss for the graphical decomposition of tidal curves. By L. F. Pourtales. pp. 398, 399.
1 diag.

*41. Report of Lieut. Comg. Alexander Murray, U. S. N., assistant Coast survey, relative to the Labrador eclipse expedition, and to incidental results bearing on the hydrography of the coast of Labrador. pp. 399–402.
1 sketch.

*42. Notes on the geology of the coast of Labrador, by Oscar M. Lieber, esq., August, 1860. pp. 402–408.
1 sketch.

*43–45. [Light-house matters.] pp. 408, 409.

1861

Report of the Superintendent of the coast survey, showing the progress of the Survey during the year 1861. Washington: Government printing office. 1862
viii, 270 pp. 1 fig., 29 maps and sketches, 2 diag. 30cm.
A. D. Bache, superintendent. Report dated at "Coast survey office, Washington, D. C., December 15, 1861."
Also published as House ex. doc. 70, 37th Cong., 2d sess. In v. 6.

APPENDICES.

*1–8. [Field and office details.] pp. 77–98.
1 fig.

*9. Tide tables for the use of navigators, prepared from the Coast survey observations, by A. D. Bache, superintendent. (Furnished by authority of the Treasury department to E. and G. W. Blunt, New York, and revised May, 1861.) pp. 98–131.
1 fig.

*10. [Report on tidal work.] pp. 132–135.

*11. Report of Professor W. P. Trowbridge, assistant Coast survey, with results of experiments made with an instrument devised by him to register depths in sounding, and distance as a log at sea. pp. 135–139.

*12. [Report on office work.] pp. 140–176.

*13. List of registered topographical sheets received subsequent to no. 754. pp. 176–178.

*14. List of registered hydrographic sheets received subsequent to no. 683. pp. 179–180.

*15. Experiments to determine the relative shrinkage and expansion of parchment paper and backed antiquarian paper. pp. 180, 181.
Sketch 31.

16. Report upon the determination of the longitude of America and Europe from the solar eclipse of July 28, 1851. By Professor Benjamin Peirce, LL. D., etc. pp. 182–195.
CONTENTS.—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.

17. Report of Professor Benjamin Peirce, LL. D., on an example for the determination of longitudes by occultations of the Pleiades. pp. 196–221.
CONTENTS.—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.

18. Abstract of the report of Dr. B. A. Gould, assistant Coast survey, on the determination of longitude at Albany, N. Y., by the telegraphic method. pp. 221–232.
CONTENTS.—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.

19. Observations of the solar eclipse of 1860, July 18, made at the Coast survey station, Gunstock mountain, New Hampshire, by Professor A. D. Bache, superintendent United States Coast survey. pp. 232–239.
CONTENTS.—(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.

20. Observations of the solar eclipse of July 18, 1860, made at the Coast survey office, Washington, D. C., by Charles A. Schott, assistant United States Coast survey. pp. 239–241.
CONTENTS.—First contact; last contact; after the eclipse; heliographic position of the spots.
1 diag.

* Exhausted.

21. Observations of the solar eclipse of July 18, 1860, made at Cambridge, Massachusetts, by B. A. Gould, assistant United States Coast survey. pp. 241, 242.

22. Discussion of the secular change of the magnetic intensity (horizontal and total) on the Atlantic, Gulf, and Pacific coasts of the United States. By Assistant Charles A. Schott. pp. 242–251.

23. 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. By Assistant Charles A. Schott. pp. 251–256.
1 map.

*24. New discussion of the distribution of the magnetic declination on the coast of Virginia, North Carolina, South Carolina, and Georgia, with a chart of the isogonic curves for 1860. By Assistant Charles A. Schott. pp. 256–259.
1 map.

25. Report on observations of the solar spots made at the Coast survey office, Washington, D. C., from August, 1860, to December, 1861, both inclusive, by Charles A. Schott, assistant United States Coast survey. pp. 259–261.
CONTENTS.—Table from August, 1860, to December, 1861, and monthly relative numbers, compared with Wolf's revised numbers; spotless days.
Sketch 29.

*26–29. [Reports on field work—Florida and Texas.] pp. 261–264.

*30. Extracts from a report by Subassistant J. S. Lawson, showing the general character of Koos bay, Oregon. pp. 264, 265.
1 map.

*31–33. [Special service of Survey parties with Army and Navy.] pp. 265–269.

*34. [Light-house matters.] pp. 269, 270.

1862

Report of the Superintendent of the coast survey, showing the progress of the Survey during the year 1862.* Washington: Government printing office. 1864.

xix, 434 pp. 1 fig., 40 maps and sketches, 3 diag. 30cm.
A. D. Bache, superintendent. Report dated at "Coast survey station, near West Cheshire, Connecticut, November 7, 1862."
Also published as House ex. doc. 22, 37th Cong., 3d sess. In v. 9.

APPENDICES.

*1–4. [Field and office details.] pp. 67–155.
1 fig.

*5. Table showing the least water in the channels of certain harbors, rivers, and anchorages on the coasts of the United States; reprinted from the list of 1859 and revised with additions and tidal data. pp. 86–92.

*6, 7. [Notices to mariners.] p. 93.

*8. Tide tables for mariners, prepared from the Coast survey observations, by A. D. Bache, superintendent. (Furnished by authority of the Treasury department to E. & G. W. Blunt, New York, and revised October, 1862.) pp. 93–126.
1 fig.

*9. Additional researches on the cotidal lines of the Gulf of Mexico, by A. D. Bache, superintendent. pp. 126, 128.
Tables of diurnal and semidiurnal tides.
Sketch 46.

*10. [Report on tidal work.] pp. 128, 129.

*11. [Report on office work.] pp. 129–155.

*12. Report of Professor Benjamin Peirce, of Harvard, on the computations of the occultations of the Pleiades for longitude. pp. 155, 156.
Longitude of America from Europe.

*13. Upon the tables of the moon, used in the reduction of the Pleiades, by Professor Benjamin Peirce, of Harvard. pp. 157, 158.
On their progressive improvements.

*14. Report of Dr. B. A. Gould on the progress of computations for deducing longitude from observations by telegraph between Calais, Me., and New Orleans, La. pp. 158–160.

* Exhausted.

*15. Discussion of the magnetic and meteorological observations made at the Girard college observatory, Philadelphia, in 1840, 1841, 1842, 1843, 1844, and 1845. Part IV.—Investigation of the eleven (or ten) year period, and of the disturbances of the horizontal component of the magnetic force. By A. D. Bache, LL. D., superintendent United States Coast survey. pp. 161–186.

CONTENTS.—Instrumental notice; correction of readings for changes of temperature; scale values; correction for progressive instrumental change; hourly normals for each month; horizontal intensity; absolute value; effect of the loss of magnetism of the bar; secular change; separation of the larger disturbances; corrected normals; investigation of the eleven (or ten) year periods, from changes in the amplitude of the solar-diurnal variation; eleven (or ten) year inequality, as indicated by the disturbances; analysis of the disturbances; annual and diurnal variation; classification of disturbances according to their magnitude.

Sketch 48.

Errata, pp. 178, 182: 1862, p. iv.

Also published in Smithsonian contributions to knowledge, v. 13, no. 162. This and the other parts were also assembled and issued by the Smithsonian institution in monographic form under the above series title.

*16. Discussion of the magnetic and meteorological observations made at the Girard college observatory, Philadelphia, in 1840, 1841, 1842, 1843, 1844, and 1845. Part V.—Investigation of the solar-diurnal variation, and of the annual inequality of the horizontal component of the magnetic force. By A. D. Bache, LL. D., superintendent United States Coast survey. pp. 186–202.

CONTENTS.—Preparation of hourly normals for each month; regular solar-diurnal variation; semiannual inequality in the diurnal variation; analysis of the solar-diurnal variation; epochs of maxima and minima; amplitude; epochs of average value; annual variation of the force.

Sketch 48.

Also published in Smithsonian contributions to knowledge, v. 13, no. 162. This and the other parts were also assembled and issued by the Smithsonian Institution in monographic form under the above series title.

*17. Discussion of the magnetic and meteorological observations made at the Girard college observatory, Philadelphia, in 1840, 1841, 1842, 1843, 1844, and 1845. Part VI.—By A. D. Bache, LL. D., superintendent United States Coast survey. Investigation of the influence of the moon on the magnetic horizontal force. pp. 202–212.

CONTENTS.—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; lunar-diurnal variation for two periods; lunar-diurnal variation in summer and winter; analysis of the lunar-diurnal variation; investigation of the horizontal force in reference to lunar phases; influence of the moon's changes of declination; influence of the moon's changes of distance.

1 diag.

Also published in Smithsonian contributions to knowledge, v. 13, no. 162. This and the other parts were also assembled and issued by the Smithsonian institution in monographic form under the same general title.

*18. Results from observations made by Assistant Charles A. Schott, in July and August, 1862, for magnetic declination, dip, and horizontal intensity in Pennsylvania, including also one station in the District of Columbia and one in New York. p. 212.

*19. 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. By A. D. Bache, superintendent United States Coast survey. pp. 212–229.

CONTENTS.—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.

The complete paper, including records and results, published in Smithsonian contributions to knowledge, v. 13, no. 166. Also collected with other parts and published as a monograph with above series title.

*20. Continuation of the list of magnetic stations and results given in appendices 28, Coast survey report of 1856; 24, Coast survey report of 1858; and 28, Coast survey report of 1860. pp. 230, 231.

*21. Report on observations of the solar spots, made at the Coast survey office, Washington, D. C., from January to August, 1862, inclusive, by Assistant Charles A. Schott. (Additional to appendix 25, Coast survey report for 1861.) pp. 231, 232.

*22. Development of Bessel's function for the effect of periodic forces, for durations of periods frequently occurring in meteorological and magnetical investigations; with examples. Communicated by Charles A. Schott, assistant United States Coast survey. pp. 232–235.

*23. Description of a new mode of constructing the axle of a magnetic dipping needle. By Assistant J. E. Hilgard. pp. 236–238.

*24. Notice of earthquake waves on the western coast of the United States, on the 23d and 25th December, 1854. (Communicated to the American association for the advancement of science, by A. D. Bache, superintendent, under authority of the Treasury department.) pp. 238–241.

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.

*25. On the origin, growth, substructure, and chronology of the Florida reef. By Captain E. B. Hunt, Corps of engineers, U. S. A. pp. 241–248.

* Exhausted.

*26. Results of experiments for determining the length of the six-metre standard bar, and its rate of expansion by heat. Reported by Assistant J. E. Hilgard. pp. 248–255.
Table of comparisons of standard bar with six metres.
Sketch 49.

*27. Comparison of the effect of atmospheric moisture on the dimensions of different kinds of drawing paper. p. 255.

*28–37. [Special duty with armies and blockading squadrons, and other occupation on the Atlantic coast.] pp. 256–265.

*38. List of capes, headlands, islands, harbors, and anchorages on the western coast of the United States, of which either topographical, hydrographic, preliminary, or complete surveys have been made, or maps, charts, or sketches issued. pp. 266–268.

*39. Directory for the Pacific coast of the United States, reported to the Superintendent of the United States coast survey. By George Davidson, assistant. pp. 268–430.

*40. [Obituaries.] pp. 431–434.

1863

Report of the Superintendent of the coast survey, showing the progress of the Survey during the year 1863. Washington: Government printing office. 1864.
xiii, 218 pp. 1 fig., 29 maps and sketches, 1 diag. 30cm.
A. D. Bache, superintendent. Report dated at "Coast survey office, Washington, D. C., December 15, 1863."
Also published as House ex. doc. 11, 38th Cong., 1st sess. In v. 8.

APPENDICES.

*1–11. [Field and office details.] pp. 61–83.
1 fig.

*12. Tide tables for the use of navigators, prepared from the Coast survey observations, by A. D. Bache, superintendent. (Furnished by authority of the Treasury department to E. & G. W. Blunt, New York, and revised, 1863.) pp. 84–117.

*13. [Report on tidal work.] pp. 117–118.

*14. [Report on office work.] pp. 119–142.

*15. [List of registered topographical sheets received subsequent to no. 844.] pp. 143, 144.

*16. [List of registered hydrographic sheets received subsequent to no. 738.] pp. 145, 146.

*17. Reports of Professor Benjamin Peirce, of Harvard, upon the occultations of the Pleiades, in 1841 and 1842. pp. 146–154.
CONTENTS.—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.

*18. Report of Dr. B. A. Gould, on the computations connected with observations by the telegraphic method for difference of longitude. pp. 154–156.

*19. Discussion of the magnetic and meteorological observations made at the Girard college observatory, Philadelphia, in 1840, 1841, 1842, 1843, 1844, and 1845. 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, by A. D. Bache, LL. D. pp. 156–183.
CONTENTS.—Instrumental notice; determination of the effect of changes of temperature, scale values, reduction of observations to a uniform temperature; recognition and separation of the larger disturbances; investigation of the eleven (or ten) year period, in the amplitude of the diurnal variation; investigation of the eleven (or ten) year period, in the disturbances, and their general analysis; annual inequality in the number and amount of disturbances; diurnal inequality of the disturbances; classification of the disturbances according to their magnitude; appendix—effect of the aurora borealis on the declination, the horizontal, and vertical force.
Sketch 30.
Also published in Smithsonian contributions to knowledge, v. 14, no. 175. This and the other parts were also assembled and issued by the Smithsonian institution in monographic form under the above series title.

*20. Discussion of the magnetic and meteorological observations made at the Girard college observatory, Philadelphia, in 1840, 1841, 1842, 1843, 1844, and 1845. Part VIII.—Investigation of the solar-diurnal variation and of the annual inequality of the vertical component of the magnetic force. By A. D. Bache, LL. D. pp. 183–195.
CONTENTS.—Preparation of hourly normals for each month and year; regular solar-diurnal variation; semiannual inequality of the diurnal variation; analysis of the diurnal variation; maxima and minima; ranges; epochs of average force; annual inequality of the vertical force.
Sketch 30.
Also published in Smithsonian contributions to knowledge, v. 14, no. 175. This and the other parts were also assembled and issued by the Smithsonian institution in monographic form under the above series title.

* Exhausted.

*21. Discussion of the magnetic and meteorological observations made at the Girard college observatory, Philadelphia, in 1840, 1841, 1842, 1843, 1844, and 1845. Part IX.—Investigation of the influence of the moon on the magnetic vertical force. By A. D. Bache, LL. D., superintendent United States Coast survey. pp. 196–204.

CONTENTS.—Number of observations for lunar discussion; distribution according to eastern and western hour-angles; differences from monthly normals, arranged for moon's hour-angles; lunar-diurnal variation in summer and winter; analysis of the lunar-diurnal variation of the vertical force; lunar effect upon inclination and total force.

1 diag.

Also published in Smithsonian contributions to knowledge, v. 14, no. 175. This and the other parts were also assembled and issued by the Smithsonian institution in monographic form under the above series title.

*22. Results reported from observations made by Assistants Charles A. Schott and G. W. Dean for magnetic declination, dip, and horizontal intensity, in Maine and Connecticut, including also a station in the District of Columbia. p. 204.

*23. Report on preliminary experiments made by Assistant George W. Dean to determine the variations of "induction time" in relay magnets now in use. p. 205.

*24. Report by Assistant J. E. Hilgard, on the trial of Harrison's globe lens at the United States Coast survey office, previous to its use in the photograph division. pp. 206, 207.

*25. Titles of scientific papers communicated by the late Major E. B. Hunt, United States Engineers, and published either in the Coast survey reports or with the Proceedings of the American association for the advancement of science. pp. 207, 208.

*26–28. [Special duty with armies and blockading squadrons, and other occupation on the Atlantic coast.] pp. 208–216.

*29. [Light-house matters.] pp. 217, 218.

1864

Report of the Superintendent of the coast survey, showing the progress of the Survey during the year 1864. Washington: Government printing office. 1866.

xiii, 315 pp. 3 fig., 36 maps and sketches, 3 diag. 30cm.

A. D. Bache, superintendent. Report dated at "Cambridge, Mass., October 26, 1864."
Also published as House ex. doc. 15, 38th Cong., 2d sess. In v. 9.

APPENDICES.

*1–6. [Field, hydrographic, and office details.] pp. 39–57.

1 fig.

*7. [Report of field work, North Carolina.] p. 57.

*8. Tide tables for the use of navigators, prepared from the Coast survey observations by A. D. Bache, superintendent. (Furnished by authority of the Treasury department to E. & G. W. Blunt, New York, and revised, 1864.) pp. 58–90.

1 fig.

*9. Report to the Superintendent by Assistant L. F. Pourtales, in charge of the field and office operations relating to tidal observations. [Subtitle.]—On observations of tides at Tahiti, made under the direction of Captain John Rodgers, U. S. N. pp. 91, 92.

Sketch 40.

*10. [Report on office work.] pp. 92–114.

*11. Report of Professor Benjamin Peirce, of Harvard, on computations for longitude from occultations of the Pleiades. p. 114.

*12. Report of Dr. B. A. Gould on the results of computations for longitude by the telegraphic method. pp. 115, 116.

*13. The problem of determining a position by angles observed upon a number of given stations. Solution of Gauss, with example, communicated by Charles A. Schott, assistant Coast survey. pp. 116–119.

*14. Report on the method of reduction, and results of the connexion of the Epping base line with the primary triangulation in the eastern states. By Charles A. Schott, assistant United States Coast survey. pp. 120–144.

CONTENTS.—(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.

* Exhausted.

*15. List of geographical positions determined by the United States Coast survey, and continued from reports of 1851, 1853, 1855, 1857, and 1859. pp. 144–182.

*16. Discussion of the magnetic and meteorological observations made at the Girard college observatory, Philadelphia, in 1840, 1841, 1842, 1843, 1844, and 1845. Part X.—Analysis of the disturbances of the dip and total force. By A. D. Bache, LL. D., president National academy of sciences, superintendent United States Coast survey. pp. 183–190.

CONTENTS.—Formation of table of disturbances of the two component parts and their combination for dip and total force; analysis of disturbances of the inclination; the annual inequalities in amount and number; eleven (or ten) year inequality; diurnal inequalities, in amount and number; classification of disturbances in dip, according to their magnitude; analysis of disturbances of total force; their annual inequalities, in amount and number; eleven (or ten) year inequality; diurnal inequalities, in amount and number; classification of disturbances in total force.

Also published in Smithsonian contributions to knowledge, v. 14, no. 186. This and the other parts were also assembled and issued by the Smithsonian institution in monographic form under the same general title.

*17. Discussion of the magnetic and meteorological observations made at the Girard college observatory, Philadelphia, in 1840, 1841, 1842, 1843, 1844, and 1845. Part XI.—Solar-diurnal variation and annual inequality of the inclination and total force, with diagrams, by A. D. Bache, LL. D., president National academy of sciences, superintendent United States coast survey. pp. 191–199.

CONTENTS.—Combination of the diurnal normals of the two components for dip and total force; solar-diurnal variation of the inclination; its semi-annual inequality; analysis of the solar-diurnal variation of the dip; maxima and minima, ranges and epochs of average value; solar-diurnal variation of the total force; its semi-annual inequality; analysis of the solar-diurnal variation of the total force; annual inequality of the dip and total force.

1 diag.

Also published in Smithsonian contributions to knowledge, v. 14, no. 186. This and the other parts were also assembled and issued by the Smithsonian institution in monographic form under the above series title.

*18. Discussion of the magnetic and meteorological observations made at the Girard college observatory, Philadelphia, in 1840, 1841, 1842, 1843, 1844, and 1845. Part XII.—Declination, inclination, and intensity, between 1841 and 1845. By A. D. Bache, LL. D., president national academy sciences, superintendent United States coast survey. pp. 199–206.

CONTENTS.—Discussion of the magnetic inclination, introductory notice; abstract of observation of dip, monthly means; collection of dip observations at Philadelphia; 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.

Also published in Smithsonian contributions to knowledge, v. 14, no. 186. This and the other parts were also assembled and published by the Smithsonian institution in monographic form under the above series title.

*19. Results of magnetic observations made in the United States by Professor J. N. Nicollet between 1832 and 1836. Communicated by A. D. Bache, LL. D., president National academy of sciences, superintendent United States Coast survey. May, 1864. pp. 207–210.

*20. Report of Assistant George W. Dean on experiments made for determining the "eduction time" of relay magnets or telegraphic "repeaters." pp. 211–220.

1 diag.

*21. Communication on the trajectory of ricochet shot from a 15-inch Rodman gun. By Charles A. Schott, assistant U. S. Coast survey. pp. 220–222.

2 figs.

*22. Report on the determination of ranges of shot from 15 and 20 inch guns. By Charles A. Schott, assistant United States Coast survey. p. 223.

*23, 24. [Light-house matters.] pp. 223–226.

1865

Report of the Superintendent of the United States coast survey, showing the progress of the Survey during the year 1865. Washington: Government printing office. 1867.

xii, 231 pp. 9 fig., 3 pl., 26 maps and sketches, 5 diag. 30cm.

A. D. Bache, superintendent. J. E. Hilgard, acting superintendent. Report dated at "Coast survey office, Washington, D. C., December 16, 1865."

Also published as House ex. doc. 75, 39th Cong., 1st sess. In v. 13.

APPENDICES.

*1–4. [Field and office details.] pp. 37–39.

*5. Extracts from a report by Sub-assistant J. S. Bradford, showing the nature of hydrographic changes at the entrances of Cape Fear river, North Carolina. p. 45.

Sketch 13.

*6. [Report on tidal work.] p. 46.

*7. [Report on office work.] pp. 47–50.

*8. List of original hydrographic and topographic sheets registered in the archives of the United States Coast survey, geographically arranged. pp. 50–99.

* Exhausted.

*9. List of geographical positions in Sections V, VI, VII, and IX, determined by the United States Coast survey, and continued from Annual report of 1864, appendix no. 15. pp. 99–136.
In South Carolina, Georgia, Florida, Texas, and Indian Territory.

*10. Geographical positions determined approximately in West Virginia, Illinois, Kentucky, Tennessee, Alabama, Mississippi, and Missouri. p. 137.

*11. Type curves of the tides of the Pacific coast of the United States. p. 138.
Sketch 26.

*12. Report on the progress of determining longitude from the occultation of the Pleiades, by Prof. Benjamin Peirce. pp. 138–146.
Values of $\Sigma_2 - p$ for 1838–1842 and 1857–1861.

*13. Method of determining the corrections of lunar semi-diameter, mean place, ellipticity of orbit, longitude of perihelion, coefficient of annual parallax, and longitude of Europe and America from the occultations of the Pleiades, by Prof. Benjamin Peirce. pp. 146–149.

*14. Report on the results of determining longitude by the telegraphic method, by Dr. B. A. Gould. pp. 150, 151.

*15. Report and tables on the declinations of standard time stars, by Dr. B. A. Gould. pp. 152–154.

*16. Report on the positions and proper motions of the four Polar stars, by Dr. B. A. Gould. pp. 155–159.

*17. Report on the latitude of Cloverden station, in Cambridge, by Dr. B. A. Gould. pp. 160–165.
CONTENTS.—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.

*18. Results of magnetical observations made at Eastport, Maine, between 1860 and 1864, for the United States Coast survey. pp. 166–174.
CONTENTS.—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.)
4 fig., 2 pl.

*19. Distribution of the magnetic declination on the coast and parts of the interior of the United States, accompanied by a chart of the isogonic lines for the epoch 1870, and a small chart of isomagnetic lines of equal annual change, by Charles A. Schott, assistant United States Coast survey. pp. 174–176.
Sketches 27 and 28.

*20. Projection table for a map of North America. pp. 176–186.
CONTENTS.—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 coordinates, latitude 5° to 85°; II, coordinates of curvature, latitude 55° to 89°; III, length, in metres, of 1° of latitude and longitude 55° to 89°.

*21. Results of the primary triangulation of the coast of New England, from the northeastern boundary to the vicinity of New York. pp. 187–203.
CONTENTS.—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.

22. On the plane-table and its use in topographical surveying. Assistant A. M. Harrison. pp. 203–231.
CONTENTS.—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.
5 fig.

1866

Report of the Superintendent of the United States coast survey, showing the progress of the Survey during the year 1866. Washington: Government printing office. 1869.

xii, 140 pp. 3 fig., 24 maps and sketches, 4 pl., 1 diag. 30^{cm}.

A. D. Bache, superintendent. J. E. Hilgard, acting superintendent. Report dated at "Washington, D. C., December 22, 1866."

Also published as House ex. doc. 87, 39th Cong., 2d sess. In v. 14.

APPENDICES.

*1–4. [Field, hydrographic, and office details.] pp. 27–34.

* Exhausted.

*5. Report by Henry Mitchell, assistant United States Coast survey, upon soundings across the straits of Florida. pp. 35–44.

CONTENTS.—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.

* Supplement to above. Rates of outrun of line. p. 139.

*6. Preliminary report on the interference tides of Hell Gate, with directions for reducing the soundings. By Henry Mitchell. pp. 44–46.

CONTENTS.—Table of relative elevations of tidal planes from observations; tides and currents of Hell Gate from observations of 1857.

*7. Tide tables for the Atlantic and Pacific coasts of the United States for the year 1867. pp. 47–49.

Only a specimen page of the tables printed in this appendix, being the predictions for Eastport, Me.

*8. Report on the 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. Prepared by Charles A. Schott, assistant. pp. 49–54.

* Supplement to above. Length of the Kent island base line. p. 140.

9. Determination of time by means of the transit instrument. Prepared for the Coast survey manual by C. A. Schott, assistant. pp. 55–71.

Description, use, adjustment, and method of observation.
1 fig.

*10. Determination of the astronomical latitude of a station by means of the zenith telescope. (Prepared for the Coast survey manual by C. A. Schott, assistant.) pp. 72–85.

CONTENTS.—(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.

*11. Determination of the astronomical azimuth of a direction. (Prepared for the Coast survey manual by C. A. Schott, assistant.) pp. 86–99.

CONTENTS.—(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.

*12. Letter of S. C. Walker, esq., to the Superintendent of the coast survey, in relation to the differences of longitude of Philadelphia and Greenwich, by reduction of observations made at Cambridge, Massachusetts. pp. 99, 100.

Reprinted. From Report 1846, app. 10, pp. 71, 72.

*13. Report of S. C. Walker, esq., to the Superintendent of the coast survey, relating to determinations of differences of longitude by telegraph, etc. pp. 100–102.

Reprinted. From Report 1846, app. 11, pp. 72–74.

*14. Annual report to the Superintendent on longitude computations, by S. C. Walker, assistant United States Coast survey. pp. 102–105.

Reprinted. From Report 1848, app. 19, pp. 112–118.

*15. Extract from the report of S. C. Walker, esq., assistant United States Coast survey, to the Superintendent, on the telegraphic operations and the computations in his charge. pp. 106–108.

Reprinted. From Report 1850, app. 15, pp. 85–89.

*16. Report of Sears C. Walker, assistant in the Coast survey, communicating the measures of wave-time made from 1849 to 1851. pp. 109–111.

Reprinted. From Report 1851, app. 25, pp. 476–479.

*17. Abstract of reports on longitudes, by Sears C. Walker, assistant in the Coast survey, to the Superintendent. pp. 111, 112.

Reprinted. From Report 1851, app. 26, pp. 480, 481.

*18. Notes of a discussion of tidal observations, made in connection with the Coast survey, at Cat island, in the Gulf of Mexico, by Professor A. D. Bache, superintendent of the coast survey. pp. 113–119.

Reprinted. From Report 1851, app. 7, pp. 127–136.
1 diag. See sketches H, 2 to 6, inclusive.

*19. Extracts from the report of Professor Agassiz to the Superintendent of the coast survey, on the examination of the Florida reefs, keys, and coast. pp. 120–130.

Reprinted. From Report 1851, app. 10, pp. 145–160.

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*Exhausted.

*20. Report to the Assistant in charge of the Coast survey office on the electrotyping operations of the Coast survey, by George Mathiot, electrotypist. pp. 130–138.
Reprinted. From Report 1851, app. 55, pp. 541–553.

* Supplement to appendix no. 5. Soundings across the Strait of Florida. p. 139.
Berryman apparatus; rates of outrun of line. See 1857, specimen sounding.
Sketch 71.

* Supplement to appendix no. 8. [Length of the Kent island base line.] p. 140.

1867

Report of the Superintendent of the United States coast survey, showing the progress of the Survey during the year 1867. Washington: Government printing office. 1869.
xii, 334 pp. 4 fig., 2 pl., 23 maps and sketches, 3 diag. 30cm.
Benjamin Peirce, superintendent. Report dated at "Cambridge, Mass., December 28, 1867."
Also published as House ex. doc. 275, 40th Cong., 2d sess. In v. 18.

APPENDICES.

*1–4. [Field and office details.] pp. 47–54.

*5. The pantograph—its use in engraving. By E. Hergesheimer. pp. 55, 56.
Sketch 27.

*6. On the longitude between America and Europe from signals through the Atlantic cable. By B. A. Gould. pp. 57–133.
CONTENTS.—(1) Origin of the Coast survey expeditions in 1865 and 1866; (2) previous determinations of trans-Atlantic longitudes from eclipses and occultations; from moon culminations; from chronometers transported from Boston to Liverpool; (3) history of the expedition of 1866; programme of trans-Atlantic 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, trans-Atlantic 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. Smithsonian contributions to knowledge, vol. 16, no. 223.

*7. Report upon the comparison of an iron meter forwarded to France by the Government of the United States of America. (Translation.) By F. A. P. Barnard and H. Tresca. pp. 134–137.
CONTENTS.—Table I, the United States meter upon the comparator; II, the Conservatoire standard upon the comparator; III, the United States meter upon the comparator; IV, results.

*8. New meridian instrument for time, latitude, and azimuth, by George Davidson, assistant United States Coast survey. pp. 138, 139.
Sketch 28.
Reprinted, Rept., 1879, app. 7, pp. 103–109.

9. On the use of railways for geodetic surveys by J. E. Hilgard, assistant in the Coast survey. pp. 140–144.
CONTENTS.—Wheel records; linear measurement; rectification of curves; reduction of the measured lines and angles to a simpler system.
Sketch 26.

*10. Description of a reflector used as a signal in triangulation, designed by J. E. Hilgard, assistant United States Coast survey. p. 145.
1 diag.

*11. Report on the field and office work relating to the tides. By R. S. Avery. pp. 146–148.

*12. Report of Assistant Henry L. Whiting, on the special survey of Provincetown harbor, Massachusetts. pp. 149–157.

*13. Report to the Superintendent of the coast survey on the tides and currents of Hell Gate, by Henry Mitchell, chief of physical hydrography, United States Coast survey. pp. 158–169.
CONTENTS.—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. (3) Intervals and heights of tides from simultaneous observations. (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.
4 figs.

*14. Report upon surveys in the Merrimack river, made in 1867 by Henry Mitchell, assistant U. S. Coast survey. pp. 170–175.
Respecting its navigation, with tables.
1 map. Sketch 2.

*15. Report of Assistant Henry Mitchell on soundings made to develop the character of the Strait of Florida between Key West and Havana. pp. 176–179.
CONTENTS.—Table I, soundings in the Gulf stream near the coast of Cuba, 1867; II, current observations.
Sketch 25.
Supplement, 1868, pp. 166–167.

*Exhausted.

*16. Report on the fauna of the Gulf stream in the strait of Florida. By Assistant L. F. Pourtales. pp 180–182.

Dredgings in the strait of Florida.

*17. Letters of Professor Agassiz on the relation of geological and zoological researches to general interests, in the development of coast features. pp. 183–186.

*18. Report of Assistant George Davidson relative to the resources and the coast features of Alaska territory. pp. 187–329.

CONTENTS.—Directory of the coast, 226–264; list of geographic positions, 265–274; aids to navigation, 274–280.
Sketches 21 to 23.
Errata, p. 289, 22 from bottom, *read* Escholtz bay.
This is the basis of the Coast pilot of Alaska, published in 1869. First submitted for publication Nov. 30, 1867.

*19–20. [Obituary, etc.] pp. 330–334.

1868

Report of the Superintendent of the United States coast survey, showing the progress of the Survey during the year 1868. Washington: Government printing office. 1871.

xiii, 277 pp. 14 fig., 28 maps and sketches, 1 diag. 30^{cm}.

Benjamin Peirce, superintendent.
This and succeeding reports are dated at the Survey office, Washington.
Also published as House ex. doc. 71, 40th Cong., 3d sess. In v. 11.

APPENDICES.

*1–4. [Field and office details.] pp. 43–50.

5. Discussion of tides in Boston harbor, by William Ferrel, M. N. A. S. pp. 51–102.

CONTENTS.—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; diurnal tide; 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.
1 fig.

*6. Mode of forming a brief tide-table for a chart, by R. S. Avery. pp. 103–108.

Sketch 29.

*7. Memoranda relating to the field-work of the secondary triangulation. Prepared by Richard D. Cutts, assistant. pp. 109–139.

CONTENTS.—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 and computations.
1 fig.
See edition 2, with additions, printed as a separate publication (1877), and edition 3 in Rept. 1882, app. 9.

*8. Method of adjustment of the secondary triangulation of Long Island sound. Communicated by Charles A. Schott, assistant Coast survey. pp. 140–146.

Example of reduction of angular measure of Shelter island; final computation and proof of correctness.
1 map.

*9. Results of the measure of an arc of the meridian of 3° 23′, between Nantucket and Farmington, Maine. Reported by Charles A. Schott, assistant Coast survey. pp. 147–153.

CONTENTS.—Length of the arc by four methods; accuracy of the preceding results; table and diagram determination of the astronomical latitudes; recapitulation of results.
1 fig., 1 map.

10. Addenda to appendixes No. 9 and No. 11 of the Coast survey report of 1866. Prepared by Charles A. Schott, assistant in charge of computing division. pp. 154–165.

CONTENTS.—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.

*11. Note on Gulf stream observations. Communicated to Professor Benjamin Peirce, superintendent United States Coast survey, by Assistant Henry Mitchell, in charge of physical hydrography. pp. 166–167.

Decrease of bottom temperature in still-water channels. (Sequel to 1867, p. 179.)

*12. Report of Assistant L. F. Pourtales on dredgings made in the sea near the Florida reefs. pp. 168–170.

Organic specimens. corals, echinoderms, brachiopods, etc.

*Exhausted.

*13. List of geographical positions determined by the United States Coast survey, continued from the annual reports of 1851, 1853, 1855, 1857, 1859, 1864, and 1865. pp. 171–242.

*14. Geographical names on the coast of Maine. By Rev. Edward Ballard, secretary of the Maine historical society. pp. 243–259.
1 fig.

*15. 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. By George Davidson, assistant United States Coast survey. pp. 260–277.
CONTENTS.—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.
4 fig.

1869

Report of the Superintendent of the United States coast survey, showing the progress of the Survey during the year 1869. Washington: Government printing office. 1872.

xxi, 259 pp. 17 fig., 23 maps and sketches, 3 diag. 30cm.
Benjamin Peirce, superintendent.
Also published as House ex. doc. 206, 41st Cong., 2d sess. In v. 8.

APPENDICES.

*1–4. [Field and office details.] pp. 65–74.

5. On the reclamation of tide-lands and its relation to navigation. By Henry Mitchell, chief in physical hydrography, United States Coast survey. pp. 75–104.
CONTENTS.—(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).
1 map, 1 diag.

*6. Report on the connection of the primary base lines on Kent island, Maryland, and on Craney island, Virginia, and on the degree of accuracy of the intervening primary and sub-primary triangulations. Prepared in May, 1871, by Charles A. Schott, assistant Coast survey. pp. 105–112.
CONTENTS.—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.

*7. Local deflections of the zenith in the vicinity of Washington city, reported February 9, 1870, by Charles A. Schott, assistant Coast survey. pp. 113–115.
1 fig.

8. Reports of observations of the eclipse of the sun on August 7, 1869, made by parties of the United States Coast survey, at the following principal stations: Bristol, Tennessee, in charge of Assistant R. D. Cutts; Shelbyville, Kentucky, in charge of Professor J. Winlock and Assistant G. W. Dean; Springfield, Illinois, in charge of Assistant C. A. Schott, under the immediate direction of the Superintendent of the survey; Des Moines, Iowa, in charge of Assistant J. E. Hilgard; and Kohklux, Chilkaht river, Alaska, in charge of Assistant G. Davidson. pp. 116–198.
Illustrated by woodcuts and plates nos. 24, 25, and 26. 16 figs., 1 map, 2 diag.
Errata, p. 165.

9. Report on the results from the observations made at the magnetical observatory, on Capitol hill, Washington, D. C., between 1867 and 1869, by Charles A. Schott, assistant. pp. 199–207.
CONTENTS.—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.

*10. Report upon deep-sea dredgings in the Gulf stream during the third cruise of the United States steamer Bibb, addressed to Professor Benjamin Peirce, superintendent United States Coast survey, by Louis Agassiz. pp. 208–219.
CONTENTS.—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.

*11. The Gulf stream.—Characteristics of the Atlantic sea-bottom off the coast of the United States, by L. F. Pourtales, assistant United States Coast survey. pp. 220–225.
Manner of dredging; silicious formation; greensand formation.

12. On the use of the zenith-telescope for observations of time, by J. E. Hilgard. pp. 226–232.

* Exhausted.

13. Abstract of a paper read before the National academy of sciences, April 16, 1869, on the earthquake-wave of August 14, 1868. By J. E. Hilgard, assistant Coast survey, in charge of office. pp. 233–234.
With wave table.

14. 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. By A. Lindenkohl, chief draughtsman, Coast survey office. p. 235.
1 diag.

*15. Reports concerning Martha's Vineyard and Nantucket, by Assistants H. L. Whiting and Henry Mitchell. pp. 236–259.
CONTENTS.—(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 Quicks 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.
1 diag.

1870

Report of the Superintendent of the United States coast survey, showing the progress of the Survey during the year 1870.* Washington: Government printing office. 1873.
1 pl.

xiii, 232 pp. 8 fig., 25 maps and sketches, 2 diag. 30^{cm}.
Benjamin Peirce, superintendent.
Also published as House ex. doc. 112, 41st Cong., 3d sess. In v. 11.

APPENDICES.

*1–4. [Field and office details.] pp. 53–65.

*5. A tabular statement of results computed for tide-tables for charts of the western coast of the United States. By R. S. Avery. pp. 66–69.

*6. Mode of forming brief prediction tide-tables. By R. S. Avery. pp. 70–74.

*7. 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, Disborough, Stony hill, Mount Holly, and Pine hill. By Richard D. Cutts, assistant Coast survey, in charge of secondary triangulation. pp. 75–76.
CONTENTS.—Heights above mean tide determined by the spirit level, p. 75; tidal stations, p. 75; instruments, p. 75; tidal observations and records, p. 76.

*8. Report on results of the barometrical observations made, in connection with the line of spirit-leveling from Raritan bay to the Delaware river, to determine the heights above mean tide of the primary stations Mount Holly, Stony hill, Pine hill, Mount Rose, Newtown, Willow grove, Gard, Bethel, and Lippincott. By Richard D. Cutts, assistant Coast survey, in charge of secondary triangulation. pp. 77–89.
CONTENTS.—Comparison of instruments and the determination of personal errors, pp. 77–81; the computations, pp. 81–89.

*9. Heights above the half tide level of the ocean of trigonometrical stations, determined by the United States Coast survey. pp. 90–91.

*10. Descriptions of bench-marks at tidal stations. pp. 92–97.

*11. Extract from a report to Professor Benjamin Peirce, superintendent United States Coast survey, relative to a method of determining elevations along the course of a tidal river, without the aid of a leveling instrument, by Assistant Henry Mitchell. pp. 98, 99.
CONTENTS.—By setting up graduated staves at such distances apart that the stacks 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.

*12. Results of the telegraphic determination of the longitude of San Francisco, California. p. 100.

*13. Abstract of results for difference of longitudes between the Harvard college observatory, Cambridge, Massachusetts, the Coast survey station, Seaton, on Capitol hill, and the United States Naval observatory, Washington, D. C., as determined by means of the electric telegraph, in 1867, by the United States Coast survey, with the cooperation of Professor Joseph Winlock, director of the Harvard observatory, and Commodore B. F. Sands, U. S. N., superintendent Naval observatory. pp. 101–106.

*14. New investigation of the secular changes in the declination, the dip, and the intensity of the magnetic force, at Washington, D. C. (Report to the Assistant in charge of the office, by Charles A. Schott, assistant.) pp. 107–110.

*Exhausted.

*15. 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, M. D., acting assistant surgeon, United States Army. (Discussed and reported to the Assistant in charge of the Coast survey office, by Charles A. Schott, assistant Coast survey.) pp. 111–114.
1 diag.

*16. Reports of observations upon the total solar eclipse of December 22, 1870. pp. 115–177.
CONTENTS.—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.
8 fig., 1 pl., 1 diag.

*16a. Report on the eclipse of the sun on the 22nd of December, 1870. By Benjamin Peirce, LL. D., superintendent United States Coast survey. pp. 229–232.
Reprinted from Report for 1871, pp. 9–14.

*17. Changes of elevation and azimuth caused by the action of the sun, at Station Dominguez, California, by Assistant George Davidson. pp. 178, 179.

*18. On the probable effect of extended piers in modifying the channel facilities of San Francisco bay, near Yerba Buena island, by Assistant Henry Mitchell. pp. 180, 181.

*19. On the phosphate beds of South Carolina, by Professor N. S. Shaler. pp. 182–189.

*20. On the moon's mass as deduced from a discussion of the tides of Boston harbor, by William Ferrel, esq. pp. 190–199.

*21. On the theory of errors of observations, by Assistant C. S. Peirce. pp. 200–224.
1 diag.

*22. Azimuth and apparent altitude of Polaris, by Assistant George Davidson. pp. 225–227.

1871

Report of the Superintendent of the United States coast survey, showing the progress of the Survey during the year 1871. Washington: Government printing office. 1874.

xv, 219 pp. 11 fig., 30 maps and sketches, 5 diag. 30cm.
Benjamin Peirce, superintendent.
Also published as House ex. doc. 121, 42d Cong., 2d sess. In v. 11.

APPENDICES.

*1–5. [Field and office details.] pp 71–92.

*6. Report of meteorological effects on tides, from observations by Prof. Wm. Ferrel. pp. 93–99.
Graphic representation of the relative amounts and direction of the wind for each of the four seasons for Boston.
1 fig.

*7. Meteorological register, Alaska territory, 1870–71, from observations at St. Paul's island, by Charles Bryant. pp. 100–108.

*8. The harbor of New York: its condition, May, 1873. Letter of Prof. Benjamin Peirce, superintendent United States Coast survey, to the Chamber of commerce of New York, with the report of Prof. Henry Mitchell on the physical survey of the harbor. pp. 109–133.
CONTENTS.—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.

*9. Report to Prof. Benjamin Peirce, superintendent United States Coast survey, concerning Nausett beach and the Peninsula of Monomoy, by Assistant Henry Mitchell. pp. 134–143.
Physical history of the neighborhood of Monomoy (sketch 35); recent movement of Chatham beach in detail; tables.

*10. Hints and suggestions upon the location of harbor-lines, by Henry Mitchell, United States Coast survey. pp. 144–153.
CONTENTS.—Value of tidal volume; encroachment on the channels; isodynamic lines (sketch 35); example; anchorage and winding room; requisite depths of frontage; length of slips; riparian rights; laws establishing harbor lines.
1 diag.

*11. Comparison of the methods of determining heights by means of leveling, vertical angles, and barometric measures, from observations at Bodega head and Ross mountain, Cal., by George Davidson and Charles A. Schott, assistants, United States Coast survey. pp. 154–170.
CONTENTS.—(1) result of the leveling operations. (2) results of hourly observations of reciprocal and simultaneous zenith distances for difference of height 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 height of the stations; diagrams.
Reprinted. Rept. 1876, app. 16, pp. 338–354.
5 fig.

* Exhausted.

*12. 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, Disborough, Stony hill, Mount Holly, and Pine hill, by Richard D. Cutts, assistant, Coast survey, in charge of secondary triangulation. pp. 171–175.

Tidal stations; instruments; field operations and records; Tables I to V.

*13. Report of observations of the total solar eclipse of December 22, 1870, by George W. Dean, assistant United States Coast survey. pp. 176–179.

Abstract of the chronographic record.

*14. Report of observation of the eclipse of the sun of December 22, 1870, by Dr. C. H. F. Peters, director of the Litchfield observatory of Hamilton college. pp. 180–184.

*15. On the adaptation of triangulations to the various conditions of configuration and character of the surface of country and other causes. Report to Prof. Benjamin Peirce, superintendent, February 20, 1873, by Charles A. Schott, assistant United States Coast survey. pp. 185–188.

Reprinted. Rept. 1876, app. 20, pp. 391–399.
2 fig.

*16. Description of a new form of mercurial horizon, in which vibrations are speedily extinguished, by J. Homer Lane, of Washington, D. C. pp. 189–192.

2 fig.
Directions for setting up and using.

*17. General index of professional and scientific papers contained in the United States Coast survey reports from 1851 to 1870. pp. 193–209.

*18. Errata from 1851 to 1870. pp. 210–219.

1872

Report of the Superintendent of the United States coast survey, showing the progress of the Survey during the year 1872. Washington: Government printing office. 1875.

xii, 267 pp. 7 fig., 3 pl., 21 maps and sketches, 4 diag. 30cm.

Benjamin Peirce, superintendent.
Also published as House ex. doc. 240, 42d Cong., 3d sess. In v. 12.

APPENDICES.

*1–5. [Field and office details.] pp. 55–68.

*6. Field and office work relating to the tides, by R. S. Avery. pp. 69–72.

*7. Maxima and minima of tides on the coast of New England for 1873, by William Ferrel. pp. 73–74.

*8. Report of the astronomical and meteorological observations made at Sherman, Wyoming territory, by Richard D. Cutts, assistant United States Coast survey, and Charles A. Young, professor of astronomy in Dartmouth college, New Hampshire, under the act of Congress of June 10, 1872. pp. 75–172.

CONTENTS.—Part I, report of R. D. Cutts (sketch 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. 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.
6 fig., 1 pl., 1 map, 2 diag.

*9. Astronomical observations on the Sierra Nevada, by George Davidson, esq., assistant in the United States Coast survey. pp. 173–176.

Description of the country adjacent to the station at Summit; the climate and opportunities for observing; the observations; Polaris, Saturn, Moon, etc.

*10. Harbors of Alaska and the tides and currents in their vicinity, by W. H. Dall, acting assistant in the United States Coast survey. pp. 177–212.

CONTENTS.—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.
Sketch 18.

*11. Voyage of the steamer Hassler from Boston to San Francisco, by L. F. Pourtales, esq., assistant in the United States Coast survey. pp. 213–221.

* Exhausted.

12. Determination of weights to be given to observations for determining time with portable transit-instruments, recorded by the chronographic method. Report to the Assistant in charge of the Coast survey office, by Charles A. Schott, assistant. pp. 222–226.

CONTENTS.—Relative weights to transits depending on the star's declination; relative weights to incomplete transit observations; reduction of observations for time.

*13. Preliminary report on the determination of transatlantic longitudes, by J. E. Hilgard, assistant. pp. 227–234.

CONTENTS.—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.

*14. Terrestrial magnetism. Notes on magnetical observations by means of portable instruments, prepared for the use of observers by C. A. Schott, assistant in the United States Coast survey. pp. 235–254.

CONTENTS.—(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.

*15. Correspondence relative to the preservation of New York harbor. pp. 255–256.

*16. The Middle-Ground shoal, New York harbor. By Henry Mitchell. pp. 257–261.

Tables of current observations.
Sketch 22.

*17. Report on shore-line changes at Edgartown harbor, Massachusetts, by H. L. Whiting, esq., assistant in the United States Coast survey. pp. 262–265.

Sketch 23.

*18. Improvement on the Hipp chronograph, by William Eimbeck. pp. 266, 267.

1 fig.

1873

Report of the Superintendent of the United States coast survey, showing the progress of the Survey during the year 1873. Washington: Government printing office. 1875.

xii, 180 pp. 2 fig., 18 maps and sketches, 3 diag. 30^{cm}.

Benjamin Peirce, superintendent.
Also published as House ex. doc. 133, 43d Cong., 1st sess. In v. 11.

APPENDICES.

*1–5. [Field and office details.] pp. 67–81.

*6. List of original topographical sheets registered in the archives of the United States Coast survey from June, 1865, to January, 1873. pp. 82–87.

*7. List of hydrographic sheets registered in the archives of the United States Coast survey from June, 1865, to January, 1873. pp. 88–93.

*8. Report on the physical survey of Portland harbor. By Henry Mitchell. pp. 94–102.

1 diag.

*9. Additional report concerning the changes in the neighborhood of Chatham and Monomoy. By Henry Mitchell. pp. 103–107.

1 diag.

*10. Note concerning changes in the submerged contours off Sandy Hook. By Henry Mitchell. pp. 108–110.

1 fig. Tables.

*11. Report of geographical and hydrographical explorations on the coast of Alaska, by W. H. Dall, assistant in the Coast survey. pp. 111–122.

CONTENTS.—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 17.

*12. Measurement of a primary base-line on Peach-Tree ridge, near Atlanta, Georgia, in 1872 and 1873, by C. O. Boutelle, assistant. Computed and reported by Charles A. Schott, assistant. pp. 123–131.

*Exhausted.

*12a. Description of the compensation base-apparatus of the U. S. Coast survey. By Lieut. E. B. Hunt, U. S. A.

CONTENTS.—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.

1 diag.

Reprinted from Rep. of 1854, pp. 132-136.

*13. Note on intervisibility of stations. By J. E. Hilgard. p. 137

1 fig.

14. A list of stars for observations of latitude. pp. 138–174.

15. Errata in the Heis catalogue of stars. pp. 175–180.

1874

Report of the Superintendent of the United States coast survey, showing the progress of the Survey during the year 1874. Washington: Government printing office. 1877.

xiv, 242 pp. 13 fig., 1 pl., 23 maps and sketches, 1 diag. 30cm.

C. P. Patterson, superintendent.

Also published as House ex. doc. 100, 43d Cong., 2d sess. In v. 14.

APPENDICES.

*1–5. [Field and office details.] pp. 49–61.

6. Geographical positions of prominent places in the United States determined astronomically or geodetically by the United States Coast survey. pp. 62–65.

7. Table of depths, showing the least water in the channels of certain harbors, rivers, and anchorages on the coasts of the United States. pp. 66–71.

*8. On the secular change of magnetic declination in the United States and other parts of North America: New discussion by Charles A. Schott, assistant Coast survey. pp. 72–108.

This is ed. 2 of the following series of editions: ed. 1, Rept. 1855, app. 48. Rept. 1856, app. 31, and Rept. 1859, app. 24; ed. 3, Separate pub. (1879); ed. 4, Rept. 1879, app. 9; ed. 5, Rept. 1882, app. 12; ed. 6, Rept. 1886, app, 12; ed. 7, Rept. 1888, app. 7; ed. 8, Rept. 1895, app. 1.

*9. Results of observations of terrestrial magnetism at Key West, Fla., made between 1860 and 1866, under the direction of Prof. W. P. Trowbridge and Mr. S. Walker; discussed and reported by Charles A. Schott, assistant United States Coast survey. pp. 109–130.

3 fig.

*10. Transit of Venus, 1769. Results of observations for determining positions occupied in Lower California and at Philadelphia, reported by Charles A. Schott, assistant, in charge of the computing division, Coast survey office. pp. 131–133.

1 map (sketch 22).

*11. Additional geographical positions determined astronomically by the Coast survey on and near the western coast. p. 134.

12. Report on an inspection of the terminal points of the proposed canals through Nicaragua and the Isthmus of Darien, by Professor H. Mitchell, United States Coast survey. pp. 135–147.

CONTENTS.—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.

*13. Economy in coal, as exemplified by the action of compound engines in the United States Coast survey steamer Hassler, reported by Charles E. Emery, consulting engineer. pp. 148–151.

General description of the "Hassler."

*14. Device for detaching from a line the heavy weight requisite in deep-sea soundings, by Lieut. Commander C. D. Sigsbee, U. S. N., assistant Coast survey. p. 152.

1 pl. (sketch 23).

*15. Improved clamp for the telescope of the theodolite. By George Davidson. p. 153.

1 fig.

*16. Description of an ocean salinometer, by J. E. Hilgard, assistant United States Coast survey. pp. 154, 155.

1 fig.

*17. Description of two forms of portable apparatus for the determination of personal equation, both relative and absolute, in observations of star transits, by J. E. Hilgard, assistant United States Coast survey. pp. 156–162.

1 fig., 1 diag.

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*Exhausted.

18. Transatlantic longitudes. Final report on the determination of 1872, with a review of previous determinations. By J. E. Hilgard, assistant. pp. 163–242.

CONTENTS.—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. Part II—Reduction of the observations made for the trans-Atlantic longitude determination of 1872; clock and instrumental corrections at Cambridge, Mass., at St. Pierre, Miquelon, Brest, Paris, and Greenwich; observations with the Gambey meridian transit; azimuths of the meridian mark; observations on α, δ, and λ Ursæ Minoris; coefficients employed; difference of longitude Paris-Brest; observations with the Gambey meridian transit and the Morse-Digney chronograph for difference of personal equation; difference of longitude, Paris-Greenwich; 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; differences of personal equations.

7 fig.

Errata, pp. 163, 164, 167, 168, 169, 172, 173, 177, 178, 180, 207, 237, 242.

Tidal researches, by William Ferrell. Stereotyped by Welsh, Bigelow & Co., Cambridge, Mass. Printed at Government printing office, Washington, D. C., 1874.

XIII, 268 pp., 13 fig.

Not numbered. Not bound with Report.

1875

Report of the Superintendent of the United States coast survey, showing the progress of the Survey during the year 1875. Washington: Government printing office. 1878.

XX, 414 pp. 15 fig., 6 pl., 24 maps and sketches, 9 diag. 30^{cm}.

C. P. Patterson, superintendent.

Also published as House ex. doc. 81, 44th Cong., 1st sess. In v. 11.

APPENDICES.

*1–5. [Field and office details.] pp. 73–86.

*6. Report upon electrotyping and photographing, by Dr. A. Zumbrock. pp. 87, 88.

*7. List of original topographic sheets, geographically arranged, registered in the archives of the United States Coast survey from January, 1834, to July, 1875. (Nos. 1 to 1378, inclusive.) pp. 89–114.

*8. List of hydrographic sheets, geographically arranged, registered in the archives of the United States Coast survey from January, 1835, to July, 1875. (Nos. 1 to 1244, inclusive.) pp. 115–138.

*9. Report on the telegraphic determination of the longitude of Key West, by Charles A. Schott, assistant in the Coast survey. pp. 139–156.

CONTENTS.—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; of clock and chronometer corrections; 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.

*10. Report on Mount St. Elias, Mount Fairweather, and some of the adjacent mountains, by William H. Dall, acting assistant in the United States Coast survey. pp. 157–188.

CONTENTS.—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 St. Elias, Cook, Crillon, Fairweather, and Vancouver; details of computations.

1 pl., 1 map.

*11. Report concerning recent observations at South Pass bar, Mississippi river, by Henry Mitchell, assistant in the United States Coast survey. pp. 189–193.

1 diag.

12. Discussion of tides in New York harbor, by William Ferrel. pp. 194–221.

CONTENTS.—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 inequalities; mean sea level; diurnal tide; Table VII; comparison of theory with observation; practcal application; directions for computing a tidal ephemeris. Appendix: Tables I to IV, for computing heights and times of high water; example.

*13. Report on the Transit of Venus expedition to Japan, by George Davidson, assistant in the United States Coast survey. pp. 222–230.

CONTENTS.—Station near Nagasaki, Japan; observers; telegraphic longitude work; details of observations of the transit; photographic work; observations at great elevations.

4 fig.

*14. Report on the Transit of Venus expedition to Chatham island, by Edwin Smith, sub-assistant in the United States Coast survey. pp. 231–248.

CONTENTS.—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.

1 map.

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* Exhausted.

*15. Description of an apparatus for recording the mean of the times of a set of observations, by C. S. Peirce, assistant in the United States Coast survey. pp. 249–253.
2 fig., 1 pl.

*16. Terrestrial magnetism. Instructions for magnetical observations. By Charles A. Schott, assistant in the United States Coast survey. pp. 254–278.
CONTENTS.—(1) Magnetic declination; adjustment of the declinometer; example of scale reading; adjustments of the theodolite; solar diurnal variation of declination at Toronto, Canada, Philadelphia, and Key West; (2) magnetic inclination; reversal of the poles of dipping needles; dip circle; magnetic dip; specimen of record for finding magnetic meridian (3) absolute and relative measures of the magnetic force; the magnetometer; deflections; oscillations; deflections for value of q of magnet H.
4 pl.
Reprinted with addition from appendix no. 14. Report of 1872.

*17. Method of closing a circuit of triangulation under certain given conditions, by Charles A. Schott, assistant, and M. H. Doolittle, United States Coast survey. pp. 279–292.
5 fig.

*18. Observations on certain harbor and river improvements collected on a voyage from Hongkong via Suez, to New York, by George Davidson, assistant in the United States Coast survey. pp. 293–314.
CONTENTS.—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; Wilhelmshaven; Amsterdam canal; entrance locks and sluices; the béton blocks; North Sea harbor breakwater; dam at Schellingwonde, eastern extremity of the Amsterdam canal; Cherbourg; docks; breakwater: Brest; docks; Admiralty pier, Dover; Portland breakwater; ripraps; Holyhead breakwater; Alderney breakwater; fascinage for breakwater foundations; river improvements.
1 diag.

*19. Formulæ and factors for the computation of geodetic latitudes, longitudes, and azimuths. pp. 315–368.
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 $\log \frac{1}{\cos \frac{1}{2} d\,L}$; 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.
2 fig.
Errata, pp. 316, 317, 318, 367.
For ed. 1, see Rept. 1860, app. 36.

*20. Meteorological researches for the use of the Coast pilot; preface and part 1, by William Ferrel. pp. 369–412.
CONTENTS.—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. 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; Chapter III, the general motion of the atmosphere; Table XI, velocities; Table VII, direction and velocities.
2 fig., 7 diag.
Errata, §§ 8, 9, 13, 15, 42.

1876

Report of the Superintendent of the United States coast survey, showing the progress of the work for the fiscal year ending with June, 1876. Washington: Government printing office. 1879.
xxii, 418 pp. 28 fig., 25 maps and sketches, 13 diag. 30^{cm}.
C. P. Patterson, superintendent.
Also published as Senate ex. doc. 37, 44th Cong., 2d sess. In v. 4.

APPENDICES.

*1–5. [Field and office details.] pp. 67–80.

6. A new system of binary arithmetic, by Benjamin Peirce, consulting geometer, United States Coast survey. pp. 81, 82.

7. A catalogue of stars for observations of latitude. J. E. Hilgard. pp. 83–129.

*8. Methods of registering tidal observations, by R. S. Avery. pp. 130–142.
CONTENTS.—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.
10 fig.

*9. Changes in the harbor of Plymouth, Mass., by Henry Mitchell. pp. 143–146.
CONTENTS.—Champlain (1605); Blaskowitz (1774); general conclusions and remarks.
Sketch 22.

*10. Report upon the physical survey of New York harbor, 1876. Henry Mitchell, United States Coast survey. pp. 147–185.
Positions of origins and termini of sections examined in 1872–73–74–75; transverse curves of velocity and perimeters.

*Exhausted.

11. Report concerning the location of a quay or pier line in the vicinity of the United States Navy-yard at New York. Henry Mitchell. pp. 186–189.

Sketch 23.

12. Review of the characteristics of the South pass, Mississippi river. Henry Mitchell. pp. 190–191.

*13. On marine governors. Charles E. Emery, consulting engineer, United States Coast survey. pp. 192, 196.

*14. Note on the theory of the economy of research, by Assistant C. S. Peirce. pp. 197–201.

Referring to laws of errors.
1 fig.

*15. Measurements of gravity at initial stations in America and Europe. C. S. Peirce, assistant. pp. 202–337.

CONTENTS.—Stations: Geneva, Paris, Berlin, Kew, Hoboken; instruments; duration of an oscillation; correction for rate of timekeeper; correction for arc; arc measures; times of amplitudes; reduction to a vacuum; coefficient of expansion; comparison of meters "A" and "49;" corrections; length of the pendulum; value of the screw revolutions of microscopes; observations of length; comparison of lengths of pendulum standards, concluded length of the pendulum; center of mass; periods of oscillation and values of gravity; length of seconds pendulum at Geneva; tables of experiments.
1 map, 12 diag. For addendum see pp. 410–416.

16. Comparison of the methods of determining heights by means of leveling, vertical angles and barometric measures, from observations at Bodega head and Ross mountain, Cal., by George Davidson and Charles A. Schott, assistants, United States Coast survey. pp. 338–354.

2 fig.
Reprinted from Report of 1871, app. 16.

17. Observations of atmospheric refraction—Contribution No. II. Determination of several heights by the spirit-level, and measures of refraction by zenith-distances, also observations of the barometer at Ragged mountain, Maine, in July, August, and September, 1874, by F. W. Perkins, subassistant. Results deduced and reported by Charles A. Schott, assistant. pp. 355–367.

CONTENTS.—(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; meteorological observations; (C) meteorological observations at Ragged mountain, at Mount Desert, and at White Head light; two short simultaneous sets; resulting differences of height.
1 fig.

18. On atmospheric refraction and adjustment of hypsometric measures—Contribution No. III. 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 differences of heights by application of the method of least squares. Discussion and report by Charles A. Schott, assistant. pp. 368–387.

CONTENTS.—(1) Zenith distances; coefficient of refraction from observed zenith distances; resulting values for coefficient of refraction; (2) heights of stations from measured difference of height, with application of the method of least squares; heights above mean sea level; equations; probable error of resulting heights; 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.
2 fig.

19. Hypsometric formula based upon thermodynamic principles, by Chas. A. Schott. pp. 388–390.

20. On the adaptation of triangulations to various conditions, depending on the configuration or orographic 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. By Charles A. Schott, assistant United States Coast and geodetic survey. pp. 391–399.

12 fig.
Reprinted, with additions, from the Report for 1871, appendix no. 15.

21. On a chart of the magnetic declination in the United States, constructed by J. E. Hilgard, assistant United States Coast and geodetic survey. pp. 400, 401.

1 map.

22. A statement concerning the relation of the lawful standards of measure of the United States to those of Great Britain and France. By J. E. Hilgard, assistant United States Coast and geodetic survey. pp. 402–406.

CONTENTS.—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.

*23. 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. pp. 407–409.

*Addendum to appendix 15. Table showing the mode of reducing the experiments. pp. 410–416.

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*Exhausted.

1877

Report of the Superintendent of the United States coast survey, showing the progress of the work for the fiscal year ending with June, 1877. Washington: Government printing office. 1880.

xxiii, 192 pp. 7 fig., 25 maps and sketches. 30^{cm}.

C. P. Patterson, superintendent.
Also published as Senate ex. doc. 12, 45th Cong., 2d sess. In v. 4.

APPENDICES.

*1–5. [Field and office details.] pp. 71–83.

6. 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. Report by Charles A. Schott, assistant. pp. 84–95.

CONTENTS.—Base lines; latitudes; azimuths; combination of arcs of the meridian; equations; 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.

*7. The magnetic observatory at Madison, Wis. Report by Charles A. Schott, assistant. pp. 96, 97.

*8. Notes concerning alleged changes in the relative elevations of land and sea. Report by Henry Mitchell, assistant. pp. 98–103.

CONTENTS.—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.

9. Description of an apparatus devised for observing currents in connection with the physical survey of the Mississippi river. Report by H. L. Marindin, assistant. pp. 104–107.

2 fig.

10. Description of an optical densimeter for ocean water. J. E. Hilgard, assistant. pp. 108–113.

1 fig.

11. An examination of three new 20-inch theodolites. Report by J. E. Hilgard, assistant. pp. 114–147.

1 fig.

12. Comparison of American and British standard yards. Report by J. E. Hilgard, assistant. pp. 148–181.

13. Description of an improved open vertical clamp for the telescopes of theodolites and meridian instruments, devised by George Davidson, assistant United States Coast survey. pp. 182–183.

1 fig.

14. Observations of the density of the waters of Chesapeake bay and its principal estuaries. Report by Lieut. Frederick Collins, United States Navy, assistant Coast survey. pp. 184–190.

CONTENTS.—Instruments employed; specific gravity; method of working; explanation of tables in the full report.
2 fig.

15. A quincuncial projection of the sphere, by C. S. Peirce, assistant. pp. 191, 192.

Tables I, II, of rectangular coordinates.
1 map.

1878

Report of the Superintendent of the U. S. coast and geodetic survey showing the progress of the work during the fiscal year ending with June, 1878. Washington: Government printing office. 1881.

xxiii, 306 pp. 1 fig., 1 pl., 30 maps and sketches, 9 diag. 30^{cm}.

C. P. Patterson, superintendent.
Also published as Senate ex. doc. 13, 45th Cong., 3d sess. In v. 2.

APPENDICES.

*1–5. [Field and office details.] pp. 67–80.

6. Observations of the transit of Mercury, May 6, 1878, made at Summit station, Central Pacific railroad. Report by B. A. Colonna, assistant. pp. 81–87.

CONTENTS.—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.
1 pl., 1 sketch (27).

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*Exhausted.

7. Observations made at Washington, D. C., of the transit of Mercury, May 6, 1878. Report of Charles A. Schott, assistant. pp. 88–91.

Observations by R. D. Cutts, William Eimbeck, and O. H. Tittmann, assistants.

8. Adjustment of the primary triangulation between the Kent island and Atlanta base-lines.—Charles A. Schott. pp. 92–120.

CONTENTS.—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.

1 fig.

9. On a physical survey of the Delaware river in front of Philadelphia, by Henry Mitchell, assistant. pp. 121–173.

CONTENTS.—The channel; form of cross section; section 7½, Southwest pass, Mississippi river; the Delaware; location of the channel; cross section; transverse curves of velocity.

4 diag.

*10. Meteorological researches, Part II. By William Ferrel. pp. 175–267.

CONTENTS.—Chapter I. The theory of cyclones. Chapter II. Practical application of the theory and comparison with observation. Chapter III. Tornadoes, hailstorms, and waterspouts.

1 map, 5 diag. (Sketches 33 to 38.)

11. Discussion of tides in Penobscot bay, Maine, by William Ferrel. pp. 268–304.

CONTENTS.—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 observation with theory; IV, p. 299, practical application.

1 map.

1879

Report of the Superintendent of the U. S. coast and geodetic survey showing the progress of the work during the fiscal year ending with June, 1879. Washington: Government printing office. 1881.

xxv, 214 pp. 2 fig., 2 pl., 34 maps and sketches, 15 diag. 30^{cm}.

C. P. Patterson, superintendent.
Also published as Senate ex. doc. 17, 46th Cong., 2d sess. In v. 2.

APPENDICES.

*1–5. [Field and office details.] pp. 77–94.

*6. Letter to Carlile P. Patterson, superintendent United States Coast and geodetic survey, Washington, D. C., from Alexander Agassiz, on the dredging operations carried on from December, 1878, to March 10, 1879, by the United States Coast survey steamer Blake, Commander J. R. Bartlett, U. S. N. pp. 95–102.

1 map.

7. Description of the Davidson meridian instrument, by George Davidson, assistant United States Coast and geodetic survey. pp. 103–109.

1 pl.

8. Comparison of local deflections of the plumb-line in latitude, longitude, and azimuth, at stations of the oblique arc along our Atlantic coast, as developed on Bessel's and Clarke's spheroids. By C. A. Schott, assistant Coast and geodetic survey. pp. 110–123.

1 diag.

*9. On the secular change of magnetic declination in the United States and at some foreign stations. By Charles A. Schott, assistant Coast and geodetic survey. pp. 124–174.

Fourth edition, June, 1881.
CONTENTS.—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; United States; France; Canada; Cuba; Jamaica; Panama; New Granada; Brazil; Mexico; Sandwich islands; Alaska; Kamtchatka; Bermuda islands; Table I, formula for magnetic declination at various places; Table II, comparison of observed and computed magnetic declinations; sketch 38; Table III, number of observations; apparent probable error of observation; sketch 37; sketch 39; Table IV, decennial value of the magnetic declination computed from preceding equations.
2 maps, 1 diag.
For other editions see ed. 1, Rept. 1855, app. 48; Rept. 1856, app. 31, and Rept. 1859, app. 24. Ed. 2, Rept. 1874, app. 8. Ed. 3, Sep. pub. (1879). Ed. 5, Rept. 1882, app. 5. Ed. 6, Rept. 1886, app. 12. Ed. 7, Rept. 1888, app. 7. Ed. 8, Rept. 1895, app. 1.

10. Physical hydrography of the Gulf of Maine, by Henry Mitchell, assistant United States Coast and geodetic survey. pp. 175–190.

CONTENTS.—General description; tides and tidal currents; tables 1 to 7; Georges bank; tables 8, 9.
1 fig., 2 diag.

*11. Report on the preparation of standard topographical drawings, by Edwin Hergesheimer, assistant United States Coast and geodetic survey. p. 191.

This paper was afterwards republished as the first part of appendix 14 Rept. 1883.
8 diag. (Illus. 42 to 49, inclusive.)

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*Exhausted.

*12. On the reconstruction of the dividing engine of the Coast and geodetic survey. A report to the Assistant in charge of the office, by G. N. Saegmuller, chief mechanician. pp. 192–198.

CONTENTS.—Table of corrected screw readings for every degree; Table I, residual errors of graduation of theodolites nos. 5, 118, 133; Table II.
1 diag.

13. Addendum to a report on a physical survey of the Delaware river, by Henry Mitchell, assistant United States Coast and geodetic survey. pp. 199, 200.

1 diag.

14. On the internal constitution of the earth. By Benjamin Peirce. p. 201.

15. On instruments and methods used for precise leveling in the Coast and geodetic survey. Report by O. H. Tittmann, assistant. pp. 202–211.

CONTENTS.—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.
1 fig., 1 pl., 1 diag.

16. Observations to determine the refraction on lines passing near a surface of water, made at different elevations across the Potomac river. Report by Andrew Braid, assistant. pp. 212, 213.

1880

Report of the Superintendent of the U. S. coast and geodetic survey showing the progress of the work during the fiscal year ending with June, 1880. Washington: Government printing office. 1882.

xxii, 419 pp. 4 fig., 12 pl., 48 maps and sketches, 28 diag. 30^{cm}.

C. P. Patterson, superintendent.
Also published as Senate ex. doc. 12, 46th Cong. 3d sess. In v. 2.

APPENDICES.

*1–5. [Field and office details.] pp. 63–80.

6. Report on the results of the longitudes of the Coast and geodetic survey determined up to the present time by means of the electric telegraph, together with their preliminary adjustment by the method of least squares. By Charles A. Schott, assistant. pp. 81–92.

CONTENTS.—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 33, conditional equations; resulting adjusted longitudes (west of Greenwich).
1 diag.

7. Explanation of apparatus for observation of telegraphic longitudes, with directions for its use. By Edwin Smith, assistant. pp. 93–95.

CONTENTS.—Description; adjustments; interchange of signals.
2 diag. (34 and 35).

8. Report on geodesic night signals, by Chas. O. Boutelle, assistant. pp. 96–109.

CONTENTS.—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; expense.
1 fig., 1 pl., 1 diag. (36 and 37).

9. Comparison of the surveys of Delaware river in front of Philadelphia, 1843 and 1878. By H. L. Marindin, assistant. pp. 110–125.

6 diag.
Tables 1, 2. Supplement, p. 116; tables 3 to 10.

10. Report on comparison of surveys of Mississippi river in the vicinity of Cubitt's gap. By H. L. Marindin, assistant. pp. 126–134.

1 diag. (44).
Tables I to V.

11. Report on geodesic leveling on the Mississippi river. By Andrew Braid, assistant. pp. 135–144.

CONTENTS.—Bench marks; instrument; rods; method of observing; specimen of record; probable and mean error; abstract of results.
3 diag. (Sketches 45, 46, 47.)

12. Report on the blue clay of the Mississippi river. By George Little, Ph. D. pp. 145–171.

CONTENTS.—List of authorities; geological history of the Mississippi river; southern drift; bluff or loess; loess or loam; the Mississippi bottoms; Port Hudson; water; analysis.
Sketch 48.

*13. A treatise on the plane-table and its use in topographical surveying. By E. Hergesheimer, assistant. pp. 172–200.

CONTENTS.—Description; alidade; 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; determining 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; heights by a vertical angle and distance; comparison of feet and metres; method of determining curves; adjustment of the new alidade for observation of altitudes; distance; stadia; composed of two parts, rod and telescope with vertical arc; focal distance; reduction of hypothenuse to base; projection for field sheets.
1 pl., 12 diag. (49 to 61.)

* Exhausted.

*14. On the determination of time, longitude, latitude, and azimuth. By Charles A. Schott, assistant. pp. 201–286.

CONTENTS.—Part I—Determination of time. 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. Part II—Determination of longitude: (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; reductions of observations for time; (4) disposition of telegraphic instruments in the observatory; arrangements I to VI; (5) concluding remarks. Part III—Latitude determination: (1) 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. Part IV—Astronomical azimuth: [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; line of collimation by reversal on star; table of local time of elongation and culmination of four circumpolar stars for 1885, latitude 40°, longitude 6h. west of Greenwich.

3 fig., 10 pl., 1 diag.

*15. A comparison of the relative value of the polyconic projection used on the Coast and geodetic survey, with some other projections. Prepared by Charles A. Schott, assistant. pp. 287–296.

CONTENTS.—Map projections classified and defined: 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—Flamstead'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; formulæ 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.

7 sketches.

*16. Report on the currents and temperatures of Bering sea and the adjacent waters. By Wm. H. Dall, assistant U. S. C. and G. survey. pp. 297–340.

CONTENTS.—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.

2 maps.

17. An account of a perfected form of the contact-slide base apparatus used in the Coast and geodetic survey. By J. E. Hilgard, assistant. pp. 341–345.

1 diag. (Sketch 82, fig. 1 to 8.)

18. An attempt to solve the problem of the first landing place of Columbus in the New world, by Captain G. V. Fox. pp. 346–411.

CONTENTS.—Introduction; narrative and discussion; the track of Navarrete; of Varnhagen; of Washington Irving; of Capt. Becher; according to G. V. Fox; conclusion; summary. A, age of Columbus; B, mile and league of Columbus; C, variation of the compass in 1492; D, the log of Columbus across the Atlantic ocean, 1492; E, the vessels of Columbus.

1 map (no. 83).

19. An inquiry into the variation of the compass off the Bahama islands, at the time of the landfall of Columbus in 1492. By Charles A. Schott, assistant. pp. 412–417.

CONTENTS.—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.

1 map. (Sketch 84.)

1881

Report of the Superintendent of the U. S. coast and geodetic survey showing the progress of the work during the fiscal year ending with June, 1881. Washington: Government printing office. 1883.

xxiii, 471 pp. 12 fig., 11 pl., 40 maps and sketches, 16 diag. 30^{cm}.

J. E. Hilgard, superintendent.

Also published as Senate ex. doc. 49, 47th Cong., 1st sess. In v. 3.

APPENDICES.

*1–5. [Field and office details.] pp. 67–90.

*6. General index of scientific papers, methods, and results contained in the appendices of the annual reports of the United States Coast and geodetic survey, from 1845 to 1880 inclusive. By C. H. Sinclair, subassistant. pp. 91–123.

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*Exhausted.

7. Type forms of topography, Columbia river. By E. Hergesheimer, assistant. pp. 124–125.
   Discussion of the forms of the hills and mountains of the basin of the Columbia river below Wallula, with diagrams.
   7 fig., 1 map.

8. Terrestrial magnetism. Directions for magnetic observations with portable instruments. By Charles A. Schott, assistant Coast and geodetic survey. pp. 126–158.
   Third and enlarged edition. For ed. 1 see Rept. 1872, app. 14; ed. 2 see Rept. 1875, app. 16.
   CONTENTS.—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; reductions from sun observations and from observations on Polaris; adjustment of the declinometer and magnetometer; magnetic axis and scale values; solar diurnal variation of the declination at Toronto, Canada, at Philadelphia, Pa., and at Key West, Fla.; times and azimuths of Polaris at elongation for the use of surveyors in determining the true meridian; magnetic declination. II, determination of the magnetic inclination; instrument; dip circle; reversal of poles of dipping needles; dip by means of a loaded needle (the Mayer method); relative total intensity by means of the dip circle. III, absolute and relative measures of the magnetic force; units of measure of the magnetic force; the magnetometer; deflections; magnetic constants; oscillations; inequality of temperature; 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; forms of magnetometers, Kew dip circle.
   Illustrations 34–37.

9. Terrestrial magnetism. Collection of results for declination, dip and intensity, from observations made by the United States Coast and geodetic survey between 1833 and 1882, July. By Charles A. Schott, assistant. pp. 159–224.
   CONTENTS.—Introductory remarks; explanation of the tables of magnetic results; tables of magnetic results arranged alphabetically by countries, description of stations arranged in same order.

10. Meteorological researches. By William Ferrel. Part III.—Barometric hypsometry and reduction of the barometer to sea-level. pp. 225–268.
    CONTENTS.—Chapter I, theory of barometric hypsometry. Chapter II, applications of the theory. Chapter III, reduction of the barometer to the sea level; hypsometrical tables. Errata in Part II.
    Illustration 38.

11. 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. Navy, assistant Coast and geodetic survey, commanding schooner Palinurus. pp. 269–353.
    CONTENTS.—Methods of conducting the investigation; (1) delineation of the beds; tides; 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; description of the oyster beds; densities; comparison of densities—Tangier; currents; deposit; effect of gales and ice; Pocomoke sound; beds; densities; comparison of densities—Pocomoke; currents; deposits; effect of ice and gales; general information given by oystermen; conclusion; tables giving statistics of output and oyster fleet; destruction of oyster beds; their preservation; investigation of the Chesapeake bay west of Tangier and Smiths island; cluster of oysters and sponge from unworked beds of the Chesapeake; dredging results—Chesapeake bay; fecundity of the beds in the sounds; success of spatting at different seasons; also investigation of temperatures; changes in density of the water; area of oyster beds; description by Assistant Dall of "drill" or *astyris*; form of questions used in collecting information from oystermen; analysis of water from Tangier and Pocomoke sounds and Chesapeake bay, by Prof. Moore, U. S. Naval academy; curves showing difference of density of water at bottom; chart of James river, showing approximate limits of oyster beds; Tangier sound, charts showing approximate position of oyster beds.
    7 pl, 3 maps, 15 diag. (Illustrations, 39–63.)

12. On the length of a nautical mile. By J. E. Hilgard. pp. 354, 356.

13. On a method of readily transferring the underground terminal marks of a base line. By O. H. Tittmann, assistant. pp. 357, 358.

14. On the flexure of pendulum supports. By C. S. Peirce, assistant. pp. 359–441.

15. On the deduction of the ellipticity of the earth from pendulum experiments. By C. S. Peirce, assistant. pp. 442–456.
    1 fig.

16. On a method of observing the coincidence of vibration of two pendulums. By C. S. Peirce, assistant. pp. 457–460.
    3 fig.

17. On the value of gravity at Paris. By C. S. Peirce, assistant. pp. 461–463.

18. Report on a new rule for currents in Delaware bay and river. By Henry Mitchell, assistant Coast and geodetic survey, in charge of physical hydrography. pp. 464–469.
    CONTENTS.—Proposed new rule for the currents of Delaware river; currents of Delaware bay; "Station no. 4," outside of Cape Henlopen—light-house bearing nearly west by compass; manner of computing middle line; rule; currents of Delaware bay; currents of Delaware river; lines of high and low water in Delaware bay and river; progress of tide in Delaware bay and river.
    1 fig.

1882

Report of the Superintendent of the U. S. coast and geodetic survey showing the progress of the work during the fiscal year ending with June, 1882. Washington: Government printing office. 1883.

xxiii, 565 pp. 27 fig, 32 maps and sketches, 17 diag. 30^{cm}.

J. E. Hilgard, superintendent.
Also published as Senate ex. doc. 77, 47th Cong., 2d sess. In v. 4.

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*Exhausted.

APPENDICES.

*1–6. [Field and office details.] pp. 71–106.

7. Description and construction of a new compensation primary base apparatus, including the determination of the length of the corresponding five-metre standard bars. By Charles A. Schott, assistant. pp. 107–138.

10 fig., 2 diag.

8. Report of the measurement of the Yolo base, Yolo county, California. By George Davidson, assistant. pp. 139–149.

1 fig., 1 sketch, 2 diag.

*9. Field-work of the triangulation. By Richard D. Cutts, assistant. pp. 151–197.

Edition 3. Reprinted, with additions, from the Coast survey Report of 1868, app. 7, and from edition 2 Separate publication (1877).
11 fig.

10. On the construction of observing tripods and scaffolds. By C. O. Boutelle, assistant. pp. 199–208.

2 diag.

*11. Results of the transcontinental line of geodetic spirit-leveling near the parallel of 39°, executed by Andrew Braid, assistant United States Coast and geodetic survey. By Charles A. Schott, assistant. Part I.—From Sandy Hook. N. J., to Saint Louis, Mo. p. 209.

CONTENTS.—Determination of the mean tidal level at Sandy Hook; instrumental constants; probable error of results from geodetic spirit leveling; tables of results and descriptions of primary and secondary bench marks between Sandy Hook, N. J., and Hagerstown, Md.; sketch showing the position of the principal bench marks from Sandy Hook, N. J., to St. Louis, Mo.
2 fig., 1 diag. (Illustration 32½.)
Appears on p. 209 by title only. Printed in full on pp. 517–556.

*12. On the secular variation of the magnetic declination in the United States and at some foreign stations. By Charles A. Schott, assistant Coast and geodetic survey. pp. 211–276.

Fifth edition, November, 1882.
CONTENTS.—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; Table I, formulæ expressing the magnetic declination at various places; Table II, comparison of observed and computed magnetic declinations; Table III, annual change of the declination and other data; secular variation at Baltimore, Md., San Francisco, Cal., and at Paris, France; graphically represented for 1790 and 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.
2 maps, 2 diag. (Illustrations 33–36.)
Other editions: Ed. 1, Rept. 1855, app. 48; Rept. 1856, app. 31; and Rept. 1859, app. 24. Ed. 2, Rept. 1874, app. 8. Ed. 3, Sep. pub. (1879). Ed. 4, Rept. 1879, app. 9. Ed. 6, Rept. 1886, app. 12. Ed. 7, Rept. 1888, app. 7. Ed. 8, Rept. 1895, app. 1.

*13. Distribution of the magnetic declination in the United States at the epoch January, 1885, with three isogonic charts. By Charles A. Schott, assistant. pp. 277–328.

CONTENTS.—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.
3 maps, 1 diag.

14. Records and results of magnetic observations made at the charge of the "Bache fund" of the National academy of sciences, from 1871 to 1876. Under the direction of J. E. Hilgard, M. N. A. S., by H. W. Blair. pp. 329–426.

CONTENTS.—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; declination, local time, dip, horizontal intensity, general results for 1873.

15. Comparison of the survey of Delaware river of 1819, between Pettys and Tinicum islands, with more recent surveys. By Henry L. Marindin, assistant. pp. 427–432.

Different cross sections compared and changes noted.
3 diag. (sketches 41, 42, and 43).

16. Study of the effect of river bends in the Lower Mississippi. By Henry Mitchell, assistant. pp. 433–436.

CONTENTS.—Inductions; Table I, a comparison of air-line and river distances with mean depths, mean widths, and mean areas; Table II, bend effects in the Mississippi river; inferences; authority for data.
1 diag. (Sketch 44.)

17. Discussion of the tides of the Pacific coast of the United States. By William Ferrel. pp. 437–450.

CONTENTS.—Tides of Port Townsend, Astoria, San Diego; determination of the general constants.
3 diag. (Sketches 45, 46, 47.)

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*Exhausted.

18. Report on the Siemens electrical deep-sea thermometer. By Commander J. R. Bartlett, U. S. N., assistant Coast and geodetic survey. (Accompanied by a description of the apparatus, by Werner Suess.) pp. 451–457.
3 fig., 2 diag. (nos. 48, 49).

*19. Recent deep-sea soundings off the Atlantic coast of the United States. By Lieutenant J. E. Pillsbury, U. S. N., assistant Coast and geodetic survey. pp. 459–461.
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.

20. The total solar eclipse of January 11, 1880, observed at Mount Santa Lucia, California. By George Davidson, assistant. pp. 463–468.
2 diag.

21. A new reduction of La Caille's observations, made at the Cape of Good Hope and at Paris 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. pp. 469–502.
CONTENTS.—Prefatory note by J. E. Hilgard; 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.

22. Report of a conference on gravity determinations, held at Washington, D. C., in May, 1882. pp. 503–516.
For pp. 517–556 see app. 11.

*23. Experimental researches on the force of gravity. By Charles S. Peirce, assistant. p. 557.
Title only. Printed in full in Rept. 1883 app. 19. pp. 473–487.

24. Tribute to the memory of Carlile P. Patterson, superintendent of the coast and geodetic survey from 1874 to 1881. pp. 559–563.

1883

Report of the Superintendent of the U. S. coast and geodetic survey showing the progress of the work during the fiscal year ending with June, 1883. Washington: Government printing office. 1884.

xxvi, 488 pp. 11 fig., 26 maps and sketches, 24 diag. 30^{cm}.
J. E. Hilgard, superintendent.
Also published as Senate ex. doc. 29, 48th Cong., 1st sess. In v. 3.

APPENDICES.

*1–5. [Field and office details.] pp. 77–119.

6. Descriptive catalogue of publications relating to the Coast and geodetic survey and to Standard measures. Compiled by Edward Goodfellow, assistant. pp. 121–135.

7. A table of depths for the harbors on the coasts of the United States. pp. 137–237.
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.

8. The estuary of the Delaware. A report by Henry Mitchell, assistant. pp. 239–245.
CONTENTS.—Introductory remarks; term estuary defined; table of half-tide dimensions of the estuary of the Delaware; mean depths, widths, and sectional areas for each nautical mile; 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.
1 fig., 1 diag. (no. 25.)

9. Report on the harmonic analysis of the tides at Sandy Hook, by William Ferrel. pp. 247–251.
Introductory letter; results of the harmonic analysis of the tides at Sandy Hook.
1 map. (Sketch 26.)

10. Description of a maxima and minima tide-predicting machine. By William Ferrel. pp. 253–272.
CONTENTS.—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.
5 diag. (Sketches 27, 28, 29, 30, 31.)

11. Results for the length of the primary base-line in Yolo county, California, measured in 1881 by the party of George Davidson, assistant. Computation and discussion of results, by Charles A. Schott, assistant. pp. 273–288.
1 diag.

*Exhausted.

12. 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 the barometer, made in March and April, 1880, by George Davidson, assistant. Reported by Charles A. Schott, assistant. pp. 289–321.

CONTENTS.—Introduction; observations of double zenith distances for the measure of refraction and of differences of height; zenith distances; hourly mean values; diurnal variation in angle of refraction, in the coefficient of refraction, and in error of computed differences of height; atmospheric pressure; atmospheric temperature; observations of atmospheric humidity; barometric differences of height; Dr. Jordan's formula; values of Δh, computed from Jordan and Rühlmann's formulæ, with apparent error in mean temperature t; comparison of Bauernfeind's theory of refraction with observations; comparison of Jordan's theory of refraction with observations; rate of change of temperature with altitude for the stratum of air; direction and force of the wind and state of the sky; diagram of the hypsometric measures.

1 diag.

13. Account and results of magnetic observations made under the direction of the United States Coast and geodetic survey in cooperation with the United States Signal office, at the United States Polar station Ooglaamie, Point Barrow, Alaska; Lieut. P. Henry Ray, A. S. O., commanding post. Reduction and discussion by Charles A. Schott, assistant, Coast and geodetic survey. pp. 323–365.

CONTENTS.—Part I, introduction; instructions for observers 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 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; separation of the larger magnetic variations or so-called disturbances and their discussion; the bifilar magnetometer.

10 fig., 1 map. (Illustration 34.)

*14. Report on the preparation of standard topographical drawings, by Edwin Hergesheimer, assistant, Coast and geodetic survey Second series. pp. 367, 368.

List of drawings which represent various special types of topography, with topographical drawings to be used as guides for inking original plane-table sheets.

16 diag. (Illustrations 35 to 50.)

*15. The transit of Mercury of November 7, 1881, as observed at Yolo base, California, by George Davidson and J. J. Gilbert, assistants. pp. 369, 370.

CONTENTS.—Point of observation; instruments used; geographical position of station; progress of transit; condition of atmosphere at time of transit; topography of surrounding country; sun's disk, at time of ingress; atmospheric disturbances; similar disturbances of signals in the day-time observations of geodetic work; intense blackness of planet's disk; problematical planet Vulcan.

16. Observations of the transit of Venus of December 6, 1882, at Washington, D. C., and at Tepusquet station, California, and at Lehman's ranch, Nevada. By C. A. Schott, B. A. Colonna, William Eimbeck, and J. S. Lawson, assistants. pp. 371–378.

CONTENTS.—Location of station at Washington; instruments and observers; contacts; errors of chronometer.

*17. Determinations of gravity and other observations made in connection with the Solar eclipse expedition, May, 1883, to Caroline island, South Pacific ocean. A report by E. D. Preston. pp. 379–381.

18. Field catalogue of 1278 time and circumpolar stars. Mean places for 1885.0. By George Davidson, assistant. pp. 383–471.

19. Determinations of gravity at Allegheny, Ebensburgh, and York, Pa., in 1879 and 1880. By Charles S. Peirce, assistant. pp. 473–487.

1884

Report of the Superintendent of the U. S. coast and geodetic survey, showing the progress of the work during the fiscal year ending with June, 1884. Washington: Government printing office. 1885.

xxviii, 622 pp. 8 fig., 23 maps and sketches, 3 diag. 30^{cm}.

J. E. Hilgard, superintendent.

Also published as House ex. doc. 43, 48th Cong., 2d sess. In v. 22.

APPENDICES.

*1–5. [Field and office details.] pp. 87–134.

4 fig.

*6. Tables for the projection of maps, based upon a polyconic development of the Clarke spheroid, and computed from the equator to the pole. pp. 135–321.

CONTENTS.—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.

Second edition printed as Special Pub. 5.

*Exhausted.

*7. Formulæ and factors for the computation of geodetic latitudes, longitudes, and azimuths. pp. 323–375.

Third edition.

CONTENTS.—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 $\log \frac{1}{\cos \frac{1}{2} dL}$; table of log F; formula and table for computing the spherical excess of triangles, based on the Clarke spheroid of 1866.

2 fig.

For ed. 1, see Rept. 1860, app. 36; ed. 2, Rept. 1875, app. 19.

8. The run of the micrometer. By George Davidson, assistant. pp. 377–385.

CONTENTS.—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 correction for the "run of microscope micrometers."

9. 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. pp. 387–390.

CONTENTS.—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.

1 map. (Ilustration 20.)

10. Results of a trigonometrical determination of the heights of the stations forming the Davidson quadrilaterals. California. Observations by George Davidson, assistant, 1876–1882. Discussion by Charles A. Schott, assistant, 1884. pp. 391–405.

CONTENTS.—Accommodation of observations to Jordan's formulæ with auxiliary tables; vertical measures and computations of heights of stations; 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; probable error of the resulting Δh and their adjustment; adjustment of the measured differences of heights of stations forming the connection of the Yolo base with the principal triangulation; recapitulation of measures.

2 fig.

11. 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. pp. 407–430.

CONTENTS.—Comparison of longitude work of the survey in 1890 with that of 1885; growth of the work; table of results; Table I, differences of longitude of stations, determined by the U. S. Coast and geodetic survey telegraphically between 1846 and 1884; Table II, differences of longitude, errors, and corrections; accuracy attained by the Survey of late years; adjustment of results by least squares; equations, coefficients, values of C_1 and of δ_1; final values, λ, of longitudes from Greenwich, in accordance with decision of the International meridian conference, held at Washington, October, 1884; comparison with adjustment of 1880; tables of longitudes, λ, of the remaining stations, probable errors of adjusted longitudes; 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.

1 diag. (illus. 21).

12. Physical hydrography of Delaware river and bay. Comparison of recent with former surveys. By H. L. Marindin, assistant. pp. 431–434.

CONTENTS.—Comparison of cross sections; changes in Delaware river between 1841 and 1881, and between 1840 and 1882.

2 diag. (Sketches 22, 23.)

*13. Geology of the sea bottom in the approaches to New York bay. By A. Lindenkohl, Coast and geodetic survey. pp. 435–438.

CONTENTS.—Prefatory remarks; characteristics of sea bottom; (1) submarine valley; (2) clay bottom extending about 100 miles seaward; (3) 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.

1 map. (Illustration 24.)

14. Determinations of gravity with the Kater pendulums at Auckland, New Zealand; Sydney, New South Wales; Singapore, British India, Tokio, Japan; San Francisco, Cal., and Washington, D. C. By Edwin Smith, assistant. pp. 439–473.

15. On the use of the noddy for measuring the amplitude of swaying in a pendulum support. By C. S. Peirce, assistant. pp. 475–482.

16. Note on the effect of the flexure of a pendulum upon its period of oscillation. By C. S. Peirce, assistant. pp. 483–485.

17. 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. pp. 619–621.

CONTENTS.—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.

1 map. (Illustration 25.)

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*Exhausted.

*18. Brief account of the exhibit made by the Coast and geodetic survey at the Southern exposition, Louisville, Ky. By H. W. Blair, assistant. pp. 489–493.

*19. History of discovery and exploration on the coasts of the United States. By J. G. Kohl, Ph. D. pp. 493–617.

CONTENTS.—(1) Discovery and exploration on the Atlantic coast from the time of the Northmen to De Vries in 1632; maps of the Atlantic coast of North America, or parts thereof, published between 1500–1770; (2) discovery and exploration of the Gulf of Mexico from Columbus, 1492–1502, to Charlevoix, 1722; titles and copies of maps illustrating Dr. Kohl's history of the discovery and exploration of the Gulf of Mexico; (3) discovery and exploration of the Pacific coast of the United States from 1532 to and including the United States exploring expeditions of the present century; titles of copies of maps of the Pacific coast of North America, or parts thereof.

1885

Report of the Superintendent of the U. S. coast and geodetic survey showing the progress of the work during the fiscal year ending with June, 1885. Washington: Government printing office. 1886.

xxiii, 516 pp. 4 fig., 1 pl., 26 maps and sketches, 19 diag. 30^{cm}.

Frank M. Thorn, superintendent.
Also published as House ex. doc. 18, 49th Cong., 1st sess. In v. 23.

APPENDICES.

*1–5. [Field and office details.] pp. 81–128.

6. The geographical distribution and secular variation of the magnetic dip and intensity in the United States. By Charles A. Schott, assistant. pp. 129–274.

CONTENTS.—Part I, explanation of the general table; magnetic dips and horizontal and total magnetic intensities in the United States and adjacent regions. Part II, secular variation of the magnetic dip; discussion of dip by least squares; annual values of magnetic dip at prominent stations and comparisons; changes in dip from 1830 to 1885; secular variation of the dip. Part III, secular variation of the horizontal component of the magnetic force and of the total intensity; annual values of magnetic horizontal force; secular variation of the horizontal intensity for northeastern United States, eastern United States, and for the western coast; secular variation of the total intensity of the magnetic force; secular variation of the direction of a freely suspended magnetic needle 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.
3 maps, 3 diag. (Illustrations 19–24.)

7. Collection of some magnetic variations off the coasts of California and Mexico, observed by Spanish navigators in the last quarter of the eighteenth century. Communicated by George Davidson, assistant. pp. 275–284.

CONTENTS.—Results obtained during the voyage of the frigate "Santiago" for discovery of north coast of California; frigate "Santiago" and schooner "Sonora;" Sr. Virey and Antonio Bucareli, commanding two frigates in expedition of 1779; voyage of 1788, vessels "Princessa" and "San Carlos," northern coast of California; voyage of the packet "San Carlos" from Ounalaska to San Blas (coincidently with frigate "Princessa"); 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, Cook's 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.

8. Geographical positions of trigonometrical points in the states of Massachusetts and Rhode Island, determined by the United States 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. pp. 285–439.

CONTENTS.—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.
2 maps. (Illustrations 25, 26.)

9. 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. pp. 441–467.

CONTENTS.—Sketch of Yolo base connections; instruments used and method of observation; 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 of 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; 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; 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.
1 fig.

10. On geodetic reconnaissance. By Charles O. Boutelle, assistant. pp. 469–481.

CONTENTS.—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.
3 fig., 2 diag. (Illustrations 27, 28.)

*Exhausted.

11. A plea for a light on Saint George's bank. By Henry Mitchell, assistant. pp. 483–485.

CONTENTS.—Exact position unknown in early times; position now accurately known, but unmarked; its position with reference to important surrounding points; benefit to be derived 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.

12. 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. pp. 487, 488.

Explanation of sketches 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.

13. On the harmonic analysis of the tides at Governor's island, New York harbor. By William Ferrel. pp. 489–493.

Results of analysis with sketch showing positions of tide gauges at Governor's island and Sandy Hook; determination of general constants.
1 map. (Illustration 35.)

14. Report on deep-sea current work in the Gulf Stream. By Lieut. J. E. Pillsbury, U. S. N., assistant. pp. 495–501.

CONTENTS.—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 position of current stations, cross section A, Gulf stream; illustrations 39 to 46, giving a graphic picture of the deep-sea current work.
1 pl., 2 maps, 8 diag.

15. Note on a device for abbreviating time reductions. By C. S. Peirce, assistant. pp. 503–508.

16. On the influence of a noddy on the period of a pendulum. By C. S. Peirce, assistant. pp. 509, 510.

17. On the effect of unequal temperature upon a reversible pendulum. By C. S. Peirce, assistant. pp. 511, 512.

*18. Tribute to the memory of Henry W. Blair, assistant. p. 513.

1886

Report of the Superintendent of the U. S. coast and geodetic survey, showing the progress of the work during the fiscal year ending with June, 1886. Washington: Government printing office. 1887.

xl, 435 pp. 4 fig., 2 maps and sketches, 1 diag. 30cm.

Frank M. Thorn, superintendent.
Also published as House ex. doc. 40, 49th Cong., 2d sess. In v. 22.

APPENDICES.

*1–5. [Field and office details.] pp. 97–151.

*6. The solar (annular) eclipse of March 5, 1886. Times of observation at San Francisco, Cal. Reported by George Davidson, assistant. p. 153.

CONTENTS.—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.

7. An examination of some of the early voyages of discovery and exploration on the Northwest coast of America from 1539 to 1603. By Prof. George Davidson, A. M., Ph. D., assistant U. S. Coast and geodetic survey. pp. 155–253

CONTENTS.—Introduction; 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.
1 map. (Illustration 18.)

8. A report on Monomoy and its shoals. By Henry Mitchell, assistant, and Charles O. Boutelle, assistant. pp. 255–261.

CONTENTS.—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. Report concerning the earliest topographical survey of Monomoy, with sketch.
2 maps.

9. Report of changes in the shore line and beaches of Marthas Vineyard as derived from comparisons of recent with former surveys. By Henry L. Whiting, assistant. pp. 263–266.

Changes discussed; map showing changes in Cotamy beach, from surveys made in 1846, 1856, 1871, and 1886.
1 map. (Illustration 21.)

*Exhausted.

10. A report on the delta of the Delaware. By Henry Mitchell, assistant. pp. 267–279.

CONTENTS.—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.
1 fig. (Illustration 22.)

11. A report of Gulf Stream explorations—Observations of currents, 1886. By Lieut. J. E. Pillsbury, U. S. N., assistant. pp. 281–290.

CONTENTS.—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.
6 diag. Plates (23 to 28) presenting curves of observations of currents in the Gulf Stream during 1885 and 1886.

12. The secular variation of the magnetic declination in the United States and at some foreign stations. (New and greatly enlarged edition.) By Charles A. Schott, assistant Coast and geodetic survey. pp. 291–407.

Sixth edition, April, 1887.
CONTENTS.—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; Atlantic coast and region east of the Appalachian range, 43 stations, with results and comparisons; central part of the United States, between the Appalachian and Rocky mountain ranges, 24 stations; results and comparisons; 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; thirty-nine magnetic stations, mainly on the Pacific coast and in the region west of the Rocky mountains; results and comparisons; graphical illustration of the secular variation (illustration 31); secular change in the position of the agonic line of North Atlantic between 1500–1900 (illustration 33); progressive change in the secular variation, with a discussion of the subject; probable errors of some of the early observations.
3 maps, 2 diag. (Illustrations 29–33.)
Other editions: Ed. 1, Rept. 1855, app. 48; Rept. 1856, app. 31, and Rept. 1859, app. 24. Ed. 2, Rept. 1874, app. 8. Ed. 3, sep. pub. (1879). Ed. 4, Rept. 1879, app. 9. Ed. 5, Rept. 1882, app. 12. Ed. 7, Rept. 1888, app. 7. Ed. 8, Rept. 1895, app. 1.

13. On the circulation of the sea through New York harbor. A report by Henry Mitchell, assistant. pp. 409–432.

CONTENTS.—Types of the tidal profiles; field work of 1885; current observations; East river tides and tidal currents; East river tides; 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, maximum and minimum slopes; comparison of restorations of level; maximum slope (by reaches) of the East river; 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); currents; tables of variations of slope and velocity; decomposition of tides; comparison of mean levels, Governor's island and Willet's Point.
3 fig., 3 diag. (Illustrations 34–39.)

1887

Report of the Superintendent of the U. S. coast and geodetic survey showing the progress of the work during the fiscal year ending with June, 1887. Washington: Government printing office. 1889.

xxxvii, 514 pp. 1 fig., 34 maps and sketches, 15 diag. 30^{cm}.

Frank M. Thorn, superintendent.
Also published as House ex. doc. 17, 50th Cong., 1st sess. In v. 24.

APPENDICES.

*1–5. [Field and office details.] pp. 95–157.

6. On the movements of the sands at the eastern entrance to Vineyard sound. By Henry Mitchell, assistant. pp. 159–163.

CONTENTS.—Changes among the Monomoy shoals; tides and currents at the entrance of Vineyard sound; composition of tidal forces; tides at entrance of Vineyard sound graphically represented.
1 map, 1 diag. (Illustrations 31, 32.)

7. Fluctuations in the level of Lake Champlain and average height of its surface above the sea. A preliminary report by Charles A. Schott, assistant. pp. 165–172.

CONTENTS.—Fluctuations of the level of Lake Champlain, from observations by the United States Engineers at Fort Montgomery, N. Y., 1871 to 1882; fluctuations in the level of Lake Ontario, from observations at Charlotte harbor, 1859 to 1881; comparison of the state of Lake Champlain with the amount of rain (and melted snow) during the years 1871–1882; effect of wind; secular variation in the level of Lake Champlain; annual variation in the level of Lake Champlain and Lake Ontario, with annual variation in rainfall; secular variation in the levels of the two lakes; absolute height of Lake Champlain above the ocean; probable uncertainty of this result.
1 diag. (Illustration 33.)

* Exhausted.

8. Gulf Stream explorations—observations of currents—1887. A report by Lieut. J. E. Pillsbury, U. S. N., assistant. pp. 173–184.

CONTENTS.—Detailed report of season's work between Rebecca shoal and Cuba; between Cape San Antonio, Cuba, and Yucatan and Cape Hatteras shoal in a direction nearly southeast; (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.

2 maps, 7 diag. (Illustrations 34–42.)

9. Heights from spirit-levelings of precision between Mobile, Ala., and Carrollton (New Orleans), La., by J. B. Weir, assistant, in 1885–'86. Report by Charles A. Schott, assistant. pp. 185–205.

CONTENTS.—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; individual results and the necessary data to enable one to judge of the accuracy of the measures; 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; the resulting heights and probable uncertainties of the line Biloxi to Mobile; description of bench marks.

10. The magnetic work of the Greely Arctic expedition. Abstract of a report by Charles A. Schott, assistant. pp. 207–210.

CONTENTS.—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.

*11. Instructions and memoranda for descriptive reports to accompany original sheets, by F. M. Thorn, superintendent. pp. 211–215.

*12. 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. pp. 217–268.

13. Addendum to a report on the estuary of the Delaware. By Henry Mitchell, assistant. pp. 269–273.

Table giving physical elements of the estuary of the Delaware, with introductory letter.
Supplementary to Rept. 1883, app. 8, pp. 269–273.

14. Report of the results of spirit-leveling of precision about New York bay and vicinity in 1886 and 1887. Observations by Assistant John B. Weir and Subassistant J. E. McGrath. Discussion by Charles A. Schott, assistant. pp. 275–300.

CONTENTS.—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; bench marks in the main line and branches of spirit levels, Sandy Hook to Dobbs Ferry.

1 map. (Illustration 43.)

15. Report on the results of the physical surveys of New York harbor. By Henry Mitchell, assistant. pp. 301–311.

CONTENTS.—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; densities at different depths, from observations taken in the summer of 1885; currents at different depths in various localities; currents at different depths, from observations for 1885; currents on the outer slope of New York harbor, 1885; depth of neutral plane below surface; limit of the tide, as affecting the scour of the channels in New York harbor. Part 2.—Courses of the Hudson tides through New York harbor; table of slopes of the Hudson and East rivers; tides (synchronous) in the tract of the Hudson.

1 fig., 6 diag. (Illustrations, 44–49.)

16. A bibliography of geodesy. By J. Howard Gore, B. S., Ph. D. pp. 313–512.

1888

Report of the Superintendent of the U. S. coast and geodetic survey showing the progress of the work during the fiscal year ending with June, 1888. Washington: Government printing office. 1889.

xxviii, 566 pp. 4 fig., 12 pl., 42 maps and sketches, 7 diag. 30^{cm}.

Frank M. Thorn, superintendent.
Also published as House ex. doc. 22, 50th Cong., 2d sess. In v. 22.

APPENDICES.

*1–5. [Field and office details.] pp. 97–166.

*6. Part I. 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. pp. 167–170.

2 maps.

Part II. Historical review of the work of the Coast and geodetic survey in connection with terrestrial magnetism. By Charles A. Schott, assistant. pp. 171–176.

4 fig.

* Exhausted.

7. The secular variation of the magnetic declination in the United States and at some foreign stations. By Charles A. Schott, assistant Coast and geodetic survey. pp. 177–312.

Seventh edition, June, 1889.

CONTENTS.—The magnetic declination; secular variation of the magnetic declination at Paris, France; magnetic disturbances or storms; 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.

4 maps, 2 diag.

Footnote to first page.—This article originally appeared in the Coast survey Report for 1855, appendix 48, and was continued in reports of 1856, 1858, and 1859, appendix 24, pp. 296–305. In the second edition, in Coast survey Report for 1874, appendix 8, pp. 72–108, the investigation appears greatly extended; the substitution of a sine for a cosine function was made, and the epoch was changed from 1830 to 1850; also some use was made of Cauchy's method of interpolation for the establishment of some second periodic terms. The third edition, issued in June, 1879, appeared in pamphlet form, and is not contained in any annual Report of the Coast and geodetic survey. The geographical range of the investigation was much enlarged, and the paper was illustrated by two plates. The next or fourth edition was brought out in June, 1881, and forms appendix 9, Coast and geodetic survey Report for 1879; it was illustrated with three plates. In the fifth edition, of November, 1882, appendix 12, Report for 1882, there were discussed 837 declinations, observed at 82 stations, situated in the United States and a few in Europe, South America, Asia, and Polynesia, the latter for the purpose of extending our knowledge of magnetic changes beyond our immediate seacoast. The sixth edition forms appendix 12, annual Report for 1886; it is distinguished by a more systematic arrangement of its contents and by a more liberal introduction of observations made at sea near our coasts; besides the number of stations to which the record and discussion extends is increased to 94, with an available material of 1,071 observed declinations. In the seventh edition the stations are increased to 102 and the number of declinations to 1,245. The Report for 1895, appendix 1, contains the eighth edition.

8. 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. pp. 313–403.

CONTENTS.—Standard geodetic data of the survey; the unit of length; the geodetic surface of reference; the standard latitude; the standard longitude; the standard azimuth; descriptions of stations; positions of stations and connecting lines shown on map; reduction of observations; method used; table of logarithmic factors for the computation of geodetic positions, between latitudes 40° 55′ and 42° 55′; position computation; length of arc of one minute in meridian and in parallel; 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 stations in Connecticut.

map.

9. Tide levels and flow of currents in New York bay and harbor. Report by Henry L. Marindin, assistant. pp. 405–408.

12 maps.

Abstract of this appendix was printed as Bulletin 3, with 2 illustrations.

10. Heights from spirit-leveling of precision between Mobile, Ala., and Okolona, Miss. Observations by J. B. Wier, assistant, and J. E. McGrath, subassistant, in 1884, 1886, and 1887. Report by Charles A. Schott, assistant. pp. 409–426.

11. Heights from spirit-leveling of precision between New Orleans, La., and Wilkerson's landing, Miss., opposite Arkansas City, Ark. Report on reduction of observations and results by Charles A. Schott, assistant. pp. 427–453.

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.

12. Heights from spirit-leveling of precision between Arkansas City (on the Mississippi river) and Little Rock, Ark. Observations by J. E. McGrath, subassistant, in 1887–88. Report by Charles A. Schott, assistant. pp. 455–464.

13. Differential method of computing the apparent places of stars for determinations of latitude. By E. D. Preston, assistant. pp. 465–470.

14. Determinations of latitude and gravity for the Hawaiian government. By E. D. Preston, assistant. pp. 471–563.

CONTENTS.—Hawaiian pronunciation; instruments; journey and work accomplished; triangulation connections between the trigonometrical and astronomical stations, and geodetic latitudes of the latter (with sketch of triangulation); connection between latitude and gravity stations on the island of Maui; latitude; micrometer; level; results; observations and reductions for Honolulu; star catalogues consulted; mean places of Hawaiian latitude stars; gravity; description of stations; methods of observation; methods of reduction; island of Maui; contour lines and compartments; pendulum observations; density of the surface rock; reduction of the time observations; Caroline islands; gravity station of 1883; description of stations; pendulums; relative times of star observations and pendulum swings; instrumental constants and chronometer corrections; star residuals; pendulum observations; reductions to standard temperature and pressure; periods of oscillation.

12 pl., 5 maps, 5 diag.

Abstract printed as Bulletin 11.

1889

Report of the Superintendent of the U. S. coast and geodetic survey showing the progress of the work during the fiscal year ending with June, 1889. Washington: Government printing office. 1890.

xxx, 506 pp. 3 fig., 34 maps and sketches, 18 diag. 30^{cm}.

T. C. Mendenhall, superintendent.

Also published as House ex. doc. 55, 51st Cong., 1st sess. In v. 27.

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* Exhausted.

APPENDICES.

*1–5. [Field and office details.] pp. 103–177.

*6. 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. pp. 179–197.

CONTENTS.—Committee metre; Repsold metre of 1876; Berlin metre no. 49, Toise du Pérou; 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.; places of observation; general adjustments; results; 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.); 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.

2 fig., 1 diag.

*7. The need of a remeasurement of the Peruvian arc. By Erasmus D. Preston, assistant. pp. 199–208.

*8. Telegraphic determination of the longitude of a station on Mount Hamilton, California, and its trigonometrical connection with the Lick observatory. Field work by C. H. Sinclair, assistant, and R. A. Marr, subassistant. Reported by Charles A. Schott, assistant. pp. 209–212.

*9. Description of two new portable transit instruments for longitude work. Constructed at the office of the Survey from designs by Edwin Smith, assistant. pp. 213–216.

1 diag.
Published also as Bulletin 16.

10. Report on the measurement of the Los Angeles base line, Los Angeles and Orange counties, California. By George Davidson, assistant. pp. 217–231.

CONTENTS.—Previous base measurements at Los Angeles; base monuments; desirability of new base measurements; reconnaissance; location of the Los Angeles base line; base piers; marking 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; the comparators; the the operations of a day's measurement; first measurement; second measurement; third measurement; summary of the three measurements.

1 map, 3 diag.

11. The distribution of the magnetic declination in the United States for the epoch 1890. (Second edition.) By Charles A. Schott, assistant. pp. 233–402.

CONTENTS.—Work done by the Coast and geodetic survey relating to magnetic declinations; local disturbances in the distribution of the declinations, dip, and intensity; collection and arrangement of magnetic declinations; general distribution of data; declinations and values reduced to the year 1890; isogonic curves for the United States (exclusive of Alaska); distribution of the declination in Alaska and adjacent regions; analytical expression for the distribution in Alaska; isogonic curves for Alaska; magnetic meridians and parallels; construction of magnetic meridians for the United States (exclusive of Alaska).

3 maps, 1 diag. 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.

12. Encroachment of the sea upon the coast of Cape Cod, Massachusetts, as shown by comparative surveys. A report by Henry L. Marindin, assistant. pp. 403–407.

1 map.

13. Cross-sections of the shore of Cape Cod between Chatham and the Highland light-house. Report by Henry L. Marindin, assistant. pp. 409–457.

1 map.

14. Recent changes in the south inlet into Edgartown harbor, Marthas Vineyard. A report by Henry L. Whiting, assistant. pp. 459, 460.

1 map.

15. Results 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. Reported by C. A. Schott, assistant. pp. 461–466.

16. Gulf stream explorations. Observations of currents, 1888 and 1889. A report by Lieut. J. E. Pillsbury, U. S. N., assistant. pp. 467–477.

8 maps, 12 diag.

17. Report on the resulting length and probable uncertainty of five principal base-lines, measured with the compensation base apparatus, Bache-Würdemann, of the Coast survey, between the years 1847 and 1855, inclusive. Submitted by Charles A. Schott, assistant, Coast and geodetic survey. pp. 479–491.

CONTENTS.—Introductory remarks: Resulting length and probable uncertainty of the base lines measured on Dauphin island, Alabama, in 1847; on Bodies island, North Carolina, in 1848; on Edisto island, South Carolina, in 1850; on Key Biscayne, Cape Florida, in 1855; at Cape Sable, Florida, in 1855.

* Exhausted.

18. Report of George Davidson, assistant U. S. Coast and geodetic survey, appointed by the President of the United States as the delegate to the Ninth conference of the International geodetic association held at Paris, October, 1889. pp. 493–503.
1 fig.

1890

Report of the Superintendent of the U. S. coast and geodetic survey showing the progress of the work during the fiscal year ending with June, 1890. Washington: Government printing office. 1891.

xxix, 780 pp. 29 fig., 17 pl., 35 maps and sketches, 20 diag. 30cm.
T. C. Mendenhall, superintendent.
Also published as House ex. doc. 80, 51st Cong., 2d sess. In v. 30.

APPENDICES.

*1–7. [Field and office details.] pp. 107–197.

8. Results of the observations made at the U. S. Coast and geodetic survey magnetic observatory, at Los Angeles, California, in charge successively of Marcus Baker, acting assistant, Carlisle Terry, jr., subassistant, and Richard E. Halter, assistant, between the years 1882 and 1889. Part I.—Results of the absolute measures of the direction and intensity of the earth's magnetic force. Discussion and report by Charles A. Schott, assistant. pp. 199–241.

9. 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 and 1889. Part II.—Results of the differential measures of the magnetic declination. Discussion and report by Charles A. Schott, assistant. pp. 243–457.
9 diag.

10. The Gulf Stream—A description of the methods employed in the investigation, and the results of the research. By John Elliott Pillsbury, lieutenant, U. S. Navy, assistant U. S. Coast and geodetic survey. pp. 459–620.
CONTENTS.—Preface; introduction; I, general historical account of the Gulf Stream and its investigations up to the time of Franklin; II, Gulf Stream investigations from the time of Franklin to those made by the U. S. Coast survey; III, Gulf Stream investigations made by the U. S. Coast survey until 1884, and those contemporary with them; IV, outfit of the "Blake" for anchoring at sea and observing the currents; V, characteristics of the Gulf Stream in the Straits of Florida and in the Yucatan passage; VI, Gulf Stream off Jupiter inlet, and off Cape Hatteras—the equatorial current; VII, causes of the Gulf Stream and of Atlantic currents; VIII, conclusions.
12 fig., 6 pl., 10 maps, 9 diag.

11. Report in relation to a portion of boundary line in dispute between the states of Maryland and Virginia. [By Henry L. Whiting, assistant.] pp. 621–623.
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.

12. 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. pp. 625–684.
16 fig., 10 pl., 1 map.
Includes observations on some islands in the North and South Atlantic ocean.

13. On an approximate method for computing probable error. By Chas. H. Kummell, computing division, U. S. Coast and geodetic survey, pp. 685–687.

13. The determination, by the method of least squares, of the relation between two variables, connected by the equation $Y=AX+B$, both variables being liable to errors of observation. By Mansfield Merriman, Ph. D., professor of civil engineering in Lehigh university, late acting assistant U. S. Coast and geodetic survey. pp. 687–690.

14. On the use of observations of currents for prediction purposes. Report by John F. Hayford, tidal division, U. S. Coast and geodetic survey. pp. 691–703.

15. Comparison of the predicted with the observed times and heights of high and low water at Sandy Hook, New Jersey, during the year 1889. A report by Alex. S. Christie, in charge of the tidal division, U. S. Coast and geodetic survey office, of the results of an investigation made under his direction by John F. Hayford, tidal computer. pp. 705–714.
2 diag.

16. On the relation of the yard to the metre. By O. H. Tittmann, assistant. pp. 715–720.
This paper is a second edition of Bulletin 9, revised by the author, with statement of later comparisons, confirming his results.

17. International geodetic association. Ninth conference. Paris, October 3–12, 1889. Address of George Davidson, assistant U. S. Coast and geodetic survey, appointed as delegate to the association on the part of the United States. pp. 721–733.

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*Exhausted.

18. 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 the 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. Compiled by O. H. Tittmann, assistant, in charge of the office of weights and measures. pp. 735–758.
1 fig., 1 pl.

19. Notes on an original manuscript chart of Bering's expedition of 1725–1730, 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 Healey Dall. pp. 759–774.
2 maps.

20. Notes on an early chart of Long Island sound and its approaches. By Charles Hervey Townshend. pp. 775–777.
1 map.

1891

Report of the Superintendent of the U. S. coast and geodetic survey showing the progress of the work during the fiscal year ending with June, 1891. In two parts. Washington: Government printing office. 1892.

T. C. Mendenhall, superintendent.
Also published as House ex. doc. 43, 52d Cong., 1st sess. In v. 31 and v. 32.

Part I. [Report.]

xxxiii, 187 pp. 20 maps and sketches. 30cm.

Part II. Appendices relating to the methods, discussions, and results of the Coast and geodetic survey. Washington: Government printing office. 1892.

746 pp. 26 fig., 6 pl., 5 maps, 23 diag. 23cm.

APPENDICES.

1. Approximate times of culminations and elongations and the azimuths at elongation of Polaris for the years between 1889 and 1910. Submitted for publication as a Bulletin November 21, 1889, by Charles A. Schott, assistant, and chief of the computing division, and first published February 18, 1890. pp. 7–13.
Reprinted from Bulletin 14.

2. 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 eye-piece micrometer. Submitted for publication as a Bulletin December 12, 1890, and first published February 26, 1891. Report on method and example of computation by Charles A. Schott, assistant, and chief of the computing division. Observations by A. T. Mosman, assistant. pp. 15–19.
Reprinted from Bulletin 21.

3. 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 1889–90, in charge of Prof. D. P. Todd. Discussion and report by C. A. Schott, assistant, and chief of the computing division. Submitted for publication March 16, 1891. pp. 21–39.

4. 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 and 1889. Part III.—Results of the differential measures of the horizontal intensity. Discussion and report by Charles A. Schott, assistant. pp. 41–267.
10 diag.

5. On the magnetic observations made during Bering's first voyage to the coasts of Kamchatka and eastern Asia in the years 1725 to 1730. Submitted for publication as a bulletin, December 12, 1890, and first published February 26, 1891. Discussion by C. A. Schott, assistant, and chief of the computing division. pp. 269–273.
Reprinted from Bulletin 20.

6. On the reduction of hydrometer observations of salt-water densities. Submitted for publication, February 18, 1890, by O. H. Tittmann, assistant, in charge of the Office of standard weights and measures. Revised for republication, February 1, 1892. pp. 275–277.
Second edition. First edition was printed as Bulletin 18.

*7. 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 coöperation of the U. S. Coast and geodetic survey. By William Libbey, jr., U. S. Fish commission. pp. 279–281.

8. On the changes in the shore lines and anchorage areas of Cape Cod (or Provincetown) harbor as shown by a comparison of surveys made between 1835, 1867, and 1890. A report by Henry L. Marindin, assistant. pp. 283–288.
2 maps.

*Exhausted.

9. Cross-sections of the shore of Cape Cod, Massachusetts, between the Cape Cod and Long Point light-houses. A report by Henry L. Marindin, assistant. pp. 289–341.

10. On observations of currents with the direction-current meter in the Straits of Florida and in the Gulf of Mexico, 1891. A report by E. E. Haskell, assistant. pp. 343–364.
    1 pl., 1 map., 7 diag.

11. Descriptive catalogue of publications relating to the U. S. Coast and geodetic survey, 1807–1890, and to U. S. Standard weights and measures, 1790–1890. Compiled by Edward Goodfellow, C. H. Sinclair, and J. B. Baylor, assistants. pp. 365–474.
    Republished as Special Pub. 2, 1898.

12. The transit of Mercury of May 9, 1881, as observed at Waikiki, Hawaiian islands. A report by E. D. Preston, assistant. pp. 475–477.

13. On observations for the variations of latitude made near Honolulu, Oahu, Hawaiian islands in coöperation with the work of the International geodetic association, and on determinations of gravity and the magnetic elements. A preliminary report by E. D. Preston, assistant. pp. 479–485.

14. Report of an expedition to Muir glacier, Alaska, with determinations of latitude and the magnetic elements at Camp Muir, Glacier bay. By Harry Fielding Reid, professor of physics at the Case school of applied science, Cleveland, Ohio. pp. 487–501.
    1 map.

15. 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, superintendent. pp. 503–564.
    1 fig., 3 pl., 1 diag.

16. Proceedings of the Topographical conference held at Washington, D. C., January 18 to March 7, 1892. pp. 565–746.
    25 fig., 2 pl., 1 map, 5 diag.

1892

Report of the Superintendent of the U. S. coast and geodetic survey, showing the progress of the work during the fiscal year ending with June, 1892. In two parts. Washington: Government printing office. 1893.

T. C. Mendenhall, superintendent.
Also published as Senate ex. doc. 37, 52d Cong., 2d sess. In v. 3 and v. 4.

Part I. [Report.]

xxxiv, 199 pp. 17 maps and sketches. 30cm.

Part II. Appendices relating to the methods, discussions, and results of the Coast and geodetic survey. Washington: Government printing office. 1894.

viii, 552 pp. 10 fig., 7 pl., 6 maps, 22 diag. 23cm.

APPENDICES.

1. On the variation of latitude at Rockville, Md., as determined from observations made in 1891 and 1892 in coöperation with the International geodetic association, by C. A. Schott. pp. 1–51.
   Preface by T. C. Mendenhall. pp. 1, 2. Descriptions of instruments, etc., by Edwin Smith. pp. 2–17.
   2 fig., 2 pl., 2 diag.

2. On the variation of latitude at Waikiki, near Honolulu, Hawaiian islands, as determined from observations made in 1891 and 1892 in coöperation with the International geodetic association. A report by E. D. Preston, assistant. pp. 53–159.
   1 fig., 3 pl., 2 maps, 9 diag.

3. 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. A report by Charles A. Schott, assistant, and chief of the computing division. pp. 161–203.
   1 fig., 1 map.

4. 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. A report by Charles A. Schott, assistant and chief of the computing division. pp. 205–224.

5. On the tides and currents in the harbor of Edgartown and in Katama bay, Marthas Vineyard. A report by Henry L. Marindin, assistant. pp. 225–241.
   1 map, 3 diag.

6. On the changes in the ocean shore lines of Nantucket island, Massachusetts, from a comparison of surveys made in the years 1846 to 1887 and in 1891. A report by Henry L. Marindin, assistant. pp. 243–252.
   1 map, 3 diag.

7. 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 and 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 Charles A. Schott, assistant. pp. 253–327.
   2 diag.

8. On the measurement of the Holton base, Holton, Ripley county, Indiana, and the St. Albans base, Kanawha county, West Virginia. pp. 329–503.
   CONTENTS.—Measurement of the Holton base: I, extracts from the records and from the reports of A. T. Mosman, assistant; 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, assistant; III, the new secondary base apparatus of the Coast and geodetic survey as used in the measurement of the Holton base, Indiana. A report by O. H. Tittmann, assistant.
   2 fig., 2 pl., 2 diag.

9. Measure of the irregularity in one turn of the micrometer screw, and the relative value of each turn. A report by George Davidson, assistant. pp. 505–513.
   1 diag.

10. On the least 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 John F. Hayford. pp. 515–527.

11. 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. Henry Turner, assistants, U. S. Coast and geodetic survey, in the years 1889, 1890, and 1891. Discussion of results and comparison with other stations by Charles A. Schott, assistant. pp. 529–533.
   1 map.

12. On the direct synthetical method of adjusting a triangulation. By Chas. H. Kummell, computing division, U. S. Coast and geodetic survey. pp. 535–552.
   4 fig.

1893

Report of the Superintendent of the U. S. coast and geodetic survey, showing the progress of the work during the fiscal year ending with June, 1893. In two parts. Washington: Government printing office. 1894.

T. C. Mendenhall, superintendent.
Also published as Senate ex. doc. 19, 53d Cong., 2d sess. In v. 2.

Part I. [Report.]

xxix, 169 pp. 19 maps and sketches. 30^{cm}.

Part II. Appendices relating to the methods, discussions, and results of the Coast and geodetic survey. Washington: Government printing office. 1895.

v, 639 pp. 48 fig., 18 pl., 6 maps, 2 facsim., 11 diag. 23^{cm}.

APPENDICES.

1. State laws authorizing officers of the United States Coast and geodetic survey to enter upon lands within state limits for the purposes of the Survey. pp. 1–18.

2. On the resulting heights from geodetic leveling along the transcontinental line of levels between St. Louis and Jefferson City, Mo., executed in the years 1882 and 1888, by Andrew Braid and Gershom Bradford, assistants, and Isaac Winston, subassistant. Discussion and report by Charles A. Schott, assistant and chief of the computing division. pp. 19–36.
   1 fig., 1 diag.

3. 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, assistant. pp. 37–116.
   30 fig., 2 pl.

4. On photography as applied to obtain an instantaneous record of lunar distances for determinations of longitude. By C. Runge. pp. 117–124.
   Translated by J. A. Flemer.

5. On the measurement of base line with steel tapes and with steel and brass wires. By Edw. Jäderin. pp. 125–164.
   1 pl., 1 diag.
   Translated by J. H. Gore.

6. Fundamental standards of length and mass. pp. 165–172.
   This paper was first published as Bulletin 26, and was republished 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.

7. Units of electrical measure. pp. 173–176.

8. Part I.—A historical account of the boundary line between the states of Pennsylvania and Delaware. Part II.—Detailed account of work on the Pennsylvania and Delaware boundary. By W. C. Hodgkins, assistant. pp. 177–222.
   1 fig., 3 maps, 2 facsim.

9. Proceedings of the Geodetic conference, held at Washington, D. C., January 9 to February 28, 1894. pp. 223–424.
   4 fig., 7 pl., 1 map, 1 diag.

10. On the preparation and arrangement of the exhibit of the United States Coast and geodetic survey at the World's columbian exposition. Report by D. B. Wainwright, assistant. pp. 425–439.

11. The variation of latitude at San Francisco, Cal., as determined from observations made by George Davidson, assistant Coast and geodetic survey, between May, 1891, and August, 1892. Discussion of results and report by Chas. A. Schott, assistant. pp. 441–508.
   2 diag.

12. Determinations of latitude, gravity, and the magnetic elements at stations in the Hawaiian islands, including a result for the mean density of the earth. 1891, 1892. A report by E. D. Preston, assistant. pp. 509–639.
   12 fig., 8 pl., 2 maps, 6 diag.

1894

Report of the Superintendent of the U. S. coast and geodetic survey showing the progress of the work during the fiscal year ending with June, 1894. In two parts. Washington: Government printing office. 1895.

W. W. Duffield, superintendent.
Also published as Senate ex. doc. 8, 53d Cong., 3d sess. In v. 3 and v. 4.

Part I. [Report.]

xvi, 165 pp. 20 maps and sketches. 30cm.

Part II. Appendices relating to the methods, discussions, and results of the Coast and geodetic survey. Washington: Government printing office. 1895.

615 pp. 10 fig., 4 pl., 5 maps, 5 diag. 30cm.

APPENDICES.

1. Relative determinations of gravity with half-second pendulums, and other pendulum investigations. By G. R. Putnam, assistant; and a report on a geologic examination of some Coast and geodetic survey gravity stations. By G. K. Gilbert, geologist United States Geological survey. pp. 7–55.
   6 fig., 1 diag.

2. Telegraphic determination of the force of gravity at Baltimore, Md., from simultaneous pendulum observations at Washington and Baltimore. By E. D. Preston, assistant. pp. 57–70.
   1 fig.

*3. Standard geodetic positions in southeastern Alaska, depending on astronomical observations made during 1892, 1893, and 1894. By C. A. Schott, assistant. pp. 71–85.
   1 diag.

4. 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, assistant. pp. 87–100.
   2 maps.

*5. 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 Charles A. Schott, assistant. pp. 101–116.

*6. 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 Charles A. Schott, assistant. pp. 117–123.

7. Manual of tides. Part III. Some connections between harmonic and nonharmonic quantities, including applications to the reduction and prediction of tides. By Rollin A. Harris. pp. 125–262.
   CONTENTS.—Preface; I, properties of compound wave having a predominating component; II, computation of nonharmonic quantities from harmonic tidal constants; III, reductions of observations made upon high and low waters; IV, to reduce results to their mean values; V, on the classification of tides; VI, prediction of tides; tables.
   1 fig., 3 diag.

* Exhausted.

8. Notes on some instruments recently made in the instrument division of the Coast and geodetic survey office. Prepared by Edwin Smith, assistant, United States Coast and geodetic survey, and chief of the instrument division. pp. 263–275.
   4 pl.

9. Formulæ and tables for the computation of geodetic positions. (Fourth edition.) pp. 277–348.
   CONTENTS.—Formulæ and factors for the computation of geodetic latitudes, longitudes, and azimuths; for primary triangulation; for subordinate triangulation; for inverse problem; corrections to longitude for differences of arc and sine; values of log sec. ½ ($\Delta\phi$); converting meters to feet and feet to meters; converting kilometers to statute miles, and statute miles to kilometers; spherical excess of triangles; tables for M computed for the Clarke spheroid; 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°.—C. A. Schott.
   2 fig.
   For ed. 1 see Rept. 1860, app. 36; ed. 2, Rept. 1875, app. 19; ed. 3, Rept. 1884, app. 7.

10. Geographic positions of trigonometric points in the State of Massachusetts, determined by the United States 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. pp. 349–615.
    CONTENTS.—Introduction and explanation of the table of positions; log factors for the computation of geodetic positions; position computation for secondary and tertiary triangulation; form for inverse solution; tabular arc values expressed in metres; spherical excess log M.; 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.
    3 maps.

1895

Report of the Superintendent of the U. S. coast and geodetic survey showing the progress of the work during the fiscal year ending with June, 1895. Washington: Government printing office. 1896.

xx, 516 pp. 10 fig., 4 pl., 5 maps and sketches, 5 diag. 30^{cm}.
Parts I and II in one volume.
W. W. Duffield, superintendent.
Also published as Senate doc. 25, 54th Cong., 1st sess. In v. 2.

APPENDICES.

1. The secular variation in direction and intensity of the earth's magnetic force in the United States and in some adjacent foreign countries. By Charles A. Schott, assistant Coast and geodetic survey. Eighth edition. pp. 167–320.
   1 map, 3 diag.
   Printed previously as Ed. 1, Rept. 1855, app. 48; 1856, app. 31, and 1859, app. 24. Ed. 2, 1874, app. 8. Ed. 3, Sep. pub. (1879). Ed. 4, Rept. 1879, app. 9. Ed. 5, Rept. 1882, app. 12. Ed. 6, Rept. 1886, app. 12. Ed. 7, Rept. 1888, app. 7.

2. Abstract of resulting latitudes of some prominent stations in Alaska and adjacent parts, as astronomically determined during 1889–1895. Reported by C. A. Schott, assistant. pp. 321–332.

3. Abstract of resulting longitudes of some prominent stations in Alaska and adjacent parts, as astronomically determined during 1889–1895. Reported by C. A. Schott, assistant. pp. 333–344.

*4. Observations of the transit of Mercury on November 10, 1894, made at the Coast and geodetic survey office, Washington, D. C. pp. 345–346.

5. Report on the changes in the depths on the bar at the entrance to Nantucket inner harbor, Massachusetts, between the years 1888 and 1893. By H. L. Marindin, assistant. pp. 347–354.
   4 diag.

6. Notes on the specific gravity of the waters of the Gulf of Mexico and the Gulf Stream. By A. Lindenkohl. pp. 355–369.
   8 fig., 2 maps.

7. Graphic method of reducing stars from mean to apparent places. By E. D. Preston, assistant. pp. 371–380.
   3 diag.

8. Description of leveling rods designed and constructed for use in geodetic leveling operations. By Isaac Winston, assistant. pp. 381, 382.
   2 diag.

*9. Report on the Rueprecht balance belonging to the United States Office of standard weights and measures. Prepared by John F. Hayford, assistant, C. & G. S. pp. 383–392.
   2 pl.

10. Tables of azimuth and apparent altitude of Polaris at different hour angles. By G. R. Putnam, assistant. pp. 393–398.

* Exhausted.

11. Subdivision 1. 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. Subdivision 2. List of original hydrographic 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 2222, inclusive. pp. 399–516.

1896

Report of the Superintendent of the U. S. coast and geodetic survey showing the progress of the work during the fiscal year ending with June, 1896. Washington: Government printing office. 1897.

xxiii, 722 pp. 5 fig., 24 maps and sketches, 5 diag. 30cm.

Parts I and II in one volume.
W. W. Duffield, superintendent.
Also published as Senate doc. 35, 54th Cong., 2d sess. In v. 2.

APPENDICES.

1. Distribution of the magnetic declination in the United States for the epoch January 1, 1900. Third edition. By Charles A. Schott, assistant. pp. 147–235.

CONTENTS.—Introduction; 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.

2. 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. Report by Assistant C. A. Schott. pp. 237–246.

1 map.

3. Resulting heights from spirit leveling between Richmond, Va., and Washington, D. C., from observations made by J. B. Weir, subassistant, in September and October, 1883, and September and October, 1884, with releveling by J. B. Weir between Richmond and Fredericksburg, Va., in May and June, 1886, and verification leveling between the two cities by I. Winston, assistant, between April and June, 1895. By Charles A. Schott, assistant. pp. 247–260.

1 map.

4. 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. Report by Charles A. Schott, assistant. pp. 261–264.

1 map.

5. 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. Report by C. A. Schott, assistant. pp. 265–284.

1 fig., 1 map.

*6. 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. pp. 285–291.

1 fig., 3 diag.

7. A new solution of a principal geodetic problem. By Chas. H. Kummell, computer. pp. 293–303.

1 fig.

*8. Tables of cross sections on the north shores of Nantucket and Marthas Vineyard, Massachusetts. By H. L. Marindin, assistant. pp. 305–346.

9. Field method of reducing portable transit time observations. By G. R. Putnam, assistant. pp. 347–352.

10. 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. pp. 353–371.

2 diag.

11. Compilation of the most recent information relative to the harbors, anchorages, and dangers to navigation in the vicinity of Chatham and Peril straits and Cook's inlet, Alaska. Arranged and compiled by Lieut. Hugh Rodman, U. S. N., assistant. pp. 373–393.

*12. Logarithms, their nature, computation, and uses, with logarithmic tables of numbers and circular functions to ten places of decimals. Part I. By W. W. Duffield, superintendent. pp. 395–722.

2 fig.

*Exhausted.

1897

Report of the Superintendent of the U. S. coast and geodetic survey showing the progress of the work during the fiscal year ending with June, 1897. Washington: Government printing office. 1898.

xxi, 774 pp. 143 fig., 17 pl., 22 maps and sketches, 12 diag. 30cm.

W. W. Duffield, superintendent.

Also published as Senate doc. 345, 55th Cong., 2d sess. In v. 29.

APPENDICES.

1. Distribution of the magnetic dip and the magnetic intensity in the United States, for the epoch January 1, 1900. (Second edition.) By Charles A. Schott, assistant. pp. 159–196.

   3 maps.

2. The telegraphic longitude net of the United States and its connection with that of Europe. 1866–1896. Report by C. A. Schott, assistant. pp. 197–261.

   CONTENTS.—Introduction and general remarks; historical note; field and office practice for the determination of telegraphic longitudes; the telegraphic longitude net of the United States; abstract of individual results for difference of longitude; exhibit of variation in personal equation between four observers, and extending over a series of years; effect of the variation in latitude upon the resulting differences of longitude; adjustment of longitude net, method of reduction; resulting longitudes, table of; method and computation of probable errors of resulting longitudes; remarks on junction of the North American and European systems of longitudes; references to additional prominent longitude stations.

   1 map.

3. Resulting longitudes of Kadiak, Unalaska and Unga, Alaska, as determined chronometrically from Sitka in 1896, by the party under the charge of Fremont Morse, assistant. Report by Charles A. Schott, assistant. pp. 263–268.

4. Resulting heights from spirit leveling between Holliday and Salina, Kans., from observations by I. Winston, assistant, between July 11 and October 28, 1895. By Chas. A. Schott, assistant. pp. 269–283.

   1 fig.

5. Results of magnetic observations made in connection with the Greenland expedition of 1896, under charge of Prof. A. E. Burton. By G. R. Putnam, assistant. pp. 285–295.

   1 map, 1 diag.

6. Results of pendulum observations made in 1895 and 1896. By G. R. Putnam, assistant. pp. 297–311.

   1 pl., 1 map.

7. Notes relating to self-registering tide gauges as used by the U. S. Coast and geodetic survey. By J. F. Pratt, assistant. pp. 313–318.

   2 fig., 3 pl.

8. Manual of tides. Part I. Introduction and historical treatment of the subject. By Rollin A. Harris. pp. 319–469.

   CONTENTS.—Preface; 1, definitions; 2, digression on plane, or two-dimensional, water waves; 3, on the origin of tides; 4, general properties of tides and modes of reduction; 5, tidal work and knowledge before the time of Newton; 6, Newton to Laplace; 7, Laplace; 8, work since the time of Laplace.

   4 fig., 6 diag.

9. Manual of tides. Part II. Tidal observation, equilibrium theory, and the harmonic analysis. By Rollin A. Harris. pp. 471–618.

   CONTENTS.—Preface; 1, observation of tides; 2, astronomy, tidal components suggested, etc.; 3, the tide-producing potential; 4, development of the tide-producing potential; 5, the harmonic analysis of tidal observations; tables.

   8 fig., 2 pl., 2 diag.

10. Phototopographic methods and instruments. By J. A. Flemer, assistant. pp. 619–735.

    CONTENTS.—Preface; introduction; 1, fundamental principles of iconometry; 2, photographs on inclined planes; 3, phototopographic methods; 4, photogrammeters; 5, iconometers and perspectographs.

    125 fig., 2 pl.

11. The duplex base apparatus, and directions for its use in the field. By William Eimbeck, assistant. pp. 737–752.

    2 fig., 3 pl., 1 diag.

12. Report on the measurement of the Salt lake base line, in Utah. By William Eimbeck, assistant. pp. 753–774.

    1 fig., 6 pl., 1 map, 2 diag.

1898

Report of the Superintendent of the U. S. coast and geodetic survey showing the progress of the work from July 1, 1897, to June 30, 1898. Washington: Government printing office. 1899.

489 pp. 16 fig., 30 pl., 20 maps and sketches, 16 diag. 30cm.

Henry S. Pritchett, superintendent.

Also published as Senate doc. 48, 55th Cong., 3d sess. In v. 5.

Introduction and historical sketch also printed separately under title, "General statement of administration and work of the Coast and geodetic Survey, with historical sketch from 1807 to 1898."

APPENDICES.

1. Resulting heights from spirit leveling between Salina and Ellis, Kans., from observations made by I. Winston, assistant, between July 2 and September 9, 1896. Report by C. A. Schott, assistant. pp. 179–193.
   CONTENTS.—Instruments; methods of observing; computations; results; description of bench marks.
   1 fig.
2. Resulting heights from spirit leveling between Ellis, Kans., and Hugo, Colo., from observations by I. Winston, assistant, between June 11 and November 17, 1897. Report by C. A. Schott, assistant. pp. 195–214.
   2 fig.
3. Resulting heights from spirit leveling between Hugo and Colorado Springs, Colo., from observations by I. Winston, assistant, between April 20 and July 8, 1898. Report by C. A. Schott, assistant. pp. 215–228.
   1 fig.
4. Inquiry into the relative value and need of a check of the Peruvian arc of 1736–1743. Report by C. A. Schott, assistant. pp. 229–232.
5. Physical observations made in connection with the Pribilof islands survey of 1897. Report by G. R. Putnam, assistant. pp. 233–241.
   CONTENTS.—Magnetic irregularities on St. George island; sea-water densities in the northeast Pacific and Bering sea; determination of the force of gravity on St. Paul island, Bering sea.
   1 fig., 1 map.
6. Report on the proceedings of the International geodetic association conference at Stuttgart, Germany, October 3d to 12th, 1898, and on geodetic operations in the United States. Report by E. D. Preston, assistant, executive officer Coast and geodetic survey, delegate on the part of the United States. pp. 243–260.
   CONTENTS.—International latitude service; gravity measures; figure of the earth; Peruvian arc; longitude—Paris, Greenwich; scientific institutions; geodetic operations in the United States.
   1 pl., 3 maps.
7. Determination of time, longitude, latitude, and azimuth. By J. F. Hayford, assistant, inspector of geodetic work. pp. 261–409.
   CONTENTS.—Introduction; 1, determination of time by means of the transit instrument; 2, the determination of the difference of longitude of two stations; 3, the determination of latitude by means of the zenith telescope; 4, the determination of the astronomical azimuth of a direction.
   9 pl., 3 diag.

*8. A plane table manual. By D. B. Wainwright, assistant. pp. 409–461.
   CONTENTS.—*a*, Preliminary statement; *b*, instruments and adjustments; *c*, field work.
   1 fig., 20 pl., 11 diag.

9. Problems in physiography, concerning salinity and temperature of the Pacific ocean. By A. Lindenkohl, U. S. Coast and geodetic survey. pp. 463–473.
   CONTENTS.—*a*, Bering sea; *b*, Okhotsk sea; *c*, central Pacific ocean.
   1 fig., 2 diag.

1899

Report of the Superintendent of the coast and geodetic survey showing the progress of the work from July 1, 1898, to June 30, 1899. Washington: Government printing office. 1900.

952 pp. 13 fig., 14 pl., 30 maps. 30^{cm}.
Henry S. Pritchett, superintendent.
Also published as Senate doc. 454, 56th Cong., 1st sess. In v. 42.

APPENDICES.

*1, 2. [Field and office details.] pp. 69–240.
   5 fig., 23 maps, 3 pl.

3. The International geodetic association for the measurement of the earth. By Erasmus D. Preston, assistant, Coast and geodetic survey, delegate on the part of the United States at the Twelfth general conference. pp. 241–269.
   CONTENTS.—Preface; I, Origin and growth; II, International geodetic convention; III, Administrative and scientific activity; IV, Proceedings of the XII general conference.
   1 map.
4. Determinations of gravity at the Polytechnic institute, Worcester, Mass., and at Columbia university, New York city, with pendulum apparatus B. By Edwin Smith, assistant. pp. 271–282.
   2 fig.
5. Resulting elevations from spirit leveling between Denver, Colo., and Rock Creek, Wyo., from observations by Isaac Winston, assistant, between May 12 and October 21, 1899. By Isaac Winston, assistant. pp. 283–298.
   1 fig.

*Exhausted.

6. Resulting elevations from spirit leveling between Abilene, Kans., and Norfolk, Nebr., from observations by A. L. Baldwin, assistant, and B. E. Tilton, aid, between May 8 and October 17, 1899. By B. E. Tilton, aid. pp. 299–320.
   1 fig.

7. Resulting elevations from spirit leveling between Gibraltar, Mich., and Cincinnati, Ohio, from observations by O. W. Ferguson, assistant, between June 3 and November 28, 1899. Report by O. W. Ferguson, assistant. pp. 321–345.
   1 fig.

8. Precise leveling in the United States. By John F. Hayford, inspector of geodetic work and chief of the computing division. pp. 347–886.
   CONTENTS.—Introduction; Vicksburg, Miss., to Meridian, Miss., line; Little Rock, Ark., to Holliday, Kans., line; Colorado Springs to Limon, Colo., line; line across Florida; direct results of observations; instruments and methods; the level net, general adjustment; relative elevation of Gulf and Atlantic; computed elevations of principal points; index to elevations and descriptions of bench marks; list of precise elevations; descriptions of bench marks; settling and rising of rods and instrument; general information.
   3 fig., 8 pl., 2 maps.

9. General report upon the magnetic survey of North Carolina, with a brief historical sketch of the fundamental phenomena of the earth's magnetism. By James B. Baylor and Daniel L. Hazard, under the direction of L. A. Bauer, chief of division of terrestrial magnetism. pp. 887–938.
   CONTENTS.—Introduction; historical sketch of the fundamental phenomena of the earth's magnetism; general account of the magnetic survey of North Carolina; the variations of the magnetic declination; secular variation of the magnetic declination in North Carolina; distribution of the magnetic declination in North Carolina for the year 1900; directions to surveyors concerning the use of the county meridians; descriptions of the magnetic stations.
   2 pl., 2 maps.

10. The magnetic work of the United States Coast and geodetic survey. By L. A. Bauer, inspector of magnetic work and chief of division of terrestrial magnetism. pp. 939–952.
    CONTENTS.—Isogonic charts published by the Survey; isoclinic and isodynamic charts; magnetic observatories; magnetic work in the polar regions; secular variation investigations; magnetic survey of the country; state magnetic surveys; magnetic survey of ocean areas.

1900

Report of the Superintendent of the coast and geodetic survey showing the progress of the work from July 1, 1899, to June 30, 1900. Washington: Government printing office. 1901.

724 pp. 138 fig., 39 pl., 83 maps, 15 diag. 30cm.
Henry S. Pritchett, superintendent.
Also published as Senate doc. 68, 56th Cong., 2d sess.

APPENDICES.

*1, 2. [Field and office details.] pp. 81–254.
   6 fig., 45 maps, 3 pl.

3. The oblique boundary line between California and Nevada. By C. H. Sinclair, assistant, Coast and geodetic survey. pp. 255–484.
   CONTENTS.—Formation of California and Nevada; early surveys bearing on the eastern boundary of California; United States Coast and geodetic survey line, 1893–1899; tables, etc., showing the results in detail; description of astronomic transits; appendix; description of stations on the random and corrected lines.
   121 fig., 32 pl., 15 maps.

4. Proportions and spacing of Roman letters as ascertained from the best examples. By Williams Welch, draftsman, Coast and geodetic survey. pp. 485–494.
   2 fig.

5. The international latitude service at Gaithersburg, Md., and Ukiah, Cal., under the auspices of the International geodetic association, by Edwin Smith, assistant, United States Coast and geodetic survey, and Mr. F. Schlesinger, special observer. pp. 495–520.
   CONTENTS.—Variations of latitude; description of station, etc.
   1 fig., 2 pl., 2 maps, 2 diag.

6. Description of precise levels nos. 7 and 8, Coast and geodetic survey, 1900. By E. G. Fischer, chief of the instrument division. pp. 521–534
   CONTENTS.—Introduction; the material; the tripod; the instrument base and center; the supporting cylinder; the telescope; the levels; the level-reading device; the finish; the weight.
   2 fig., 2 pl., 1 diag.

7. Manual of tides. Part IVa. Outlines of tidal theory. By Rollin A. Harris. pp. 535–700.
   CONTENTS.—Preface; tidal forces and equilibrium tides; hydrodynamics; oscillating areas; concerning waves in deep water and long waves where the depth may vary; experiments with moderately long waves; small oscillations sustained by periodic forces; a partial explanation of the tides; on the classification of rivers, straits, bays, etc., with reference to their tidal movements; tables.
   6 fig., 21 maps, 12 diag.

8. The determination of the mean value of one revolution of a micrometer screw and the progressive and periodic errors of the screw, from observations on a circumpolar star near its elongation. By Edwin Smith, assistant. pp. 701–712.

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* Exhausted.

1901

Report of the Superintendent of the coast and geodetic survey showing the progress of the work from July 1, 1900, to June 30, 1901. Washington: Government printing office. 1902.

440 pp. 2 fig., 15 pl., 50 maps and sketches, 2 diag. 30^{cm}.
O. H. Tittmann, superintendent.
Also published as Senate doc. 50, 57th Cong., 1st sess.

APPENDICES.

*1, 2. [Field and office details.] pp. 57–227.
50 maps.

3. On the measurement of nine base lines along the Ninety-eighth meridian. By A. L. Baldwin, computer and chief of party, with preface by John F. Hayford, inspector of geodetic work. pp. 229–302.

4. Extension of tables for the computation of geodetic positions to the equator. By John F. Hayford. pp. 303–339.

5. Determination of relative value of gravity in Europe and the United States in 1900. By G. R. Putnam, assistant. pp. 341–355.

6. Triangulation northward along the Ninety-eighth meridian in Kansas and Nebraska. By John F. Hayford, inspector of geodetic work. pp. 357–423.

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* Exhausted.

BULLETINS.

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

VOLUME I.†

United States Coast and geodetic survey. T. C. Mendenhall, superintendent. Bulletins. vol. 1. [Seal of the survey]. Washington: Government printing office. 1893.

Nos. 1 to 25. 1888–1892. 261 pp. 2 fig., 7 pl., 36 maps, 6 diag. 30cm.

1. Recent publications. 1888.
   pp. 1–4.

2. Notes on Alaska from recent surveys. 1888.
   pp. 3–6.

3. Tidal levels and flow of currents in New York bay and harbor. By Henry L. Marindin, assistant. 1888.
   pp. 7–12. 2 maps.
   Abstract of app. 9, Rept. 1888.

4. Resources of and developments in Alaska. By George Davidson, assistant. 1888.
   pp. 13–24.

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. By Charles A. Schott, assistant. 1888.
   pp. 25–28. 2 maps.

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. By Charles A. Schott, assistant. 1888.
   pp. 29–43. 3 maps.

7. Historical review of the work of the Coast and geodetic survey in connection with terrestrial magnetism. By Charles A. Schott, assistant. 1888.
   pp. 35–40. 4 maps.

8. Currents of New York bay and harbor. Compiled by B. A. Colonna, assistant, from the notes of a physical survey by H. L. Marindin, assistant. (First edition.) 1888.
   pp. 41–43.
   Same. Ed. 2, 1889. This supersedes the first edition, the issue of which was suppressed.

9. On the relation of the yard to the metre. By O. H. Tittmann, assistant. 1889.
   pp. 45–50.

10. Report on the sounds and estuaries of North Carolina with reference to oyster culture. By Francis Winslow, lieutenant, U. S. N., assistant, U. S. Coast and geodetic survey, commanding schooner Scoresby. 1889.
    pp. 51–136. 2 maps, 1 diag.
    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.

†Not available for distribution in volume form.

11. Determinations of latitude and gravity for the Hawaiian government. By E. D. Preston, assistant. 1889.

pp. 137–142. 1 fig. and 3 progress maps.

CONTENTS.—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 appears in full in appendix 14, Rept. 1888.

12. A syphon tide-gauge for the open seacoast. By Henry L. Marindin, assistant. 1889.

pp. 143–146. 1 diag.

13. Telegraphic determination of the longitude of Mount Hamilton, California. Field work by C. H. Sinclair, assistant, and R. A. Marr, subassistant. Report by Charles A. Schott, assistant. 1889.

pp. 147–150.

14. Approximate times of culminations and elongations and of the azimuths at elongation of Polaris for the years between 1889 and 1910. Prepared for publication by Charles A. Schott, assistant. 1890.

pp. 151–155. Reprinted in Rept. 1891, pt. 2, app. 1.

15. Verification of weights and measures. By O. H. Tittmann, assistant. 1889.

pp. 157, 158. 1 diag.

16. Description of two new transit instruments for longitude work. Constructed at the office of the Survey from designs by Edwin Smith, assistant. 1889.

pp. 161–164. 1 fig., 1 diag.

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. 1889.

pp. 165–173.

18. Table for the reduction of hydrometer observations of salt-water densities. Prepared for publication by O. H. Tittmann, assistant. 1890.

pp. 175–177. A second edition was printed as appendix 6, Rept. 1891.

19. On the sounds and estuaries of Georgia with reference to oyster culture. A report by J. C. Drake, ensign, U. S. N., assistant, U. S. Coast and geodetic survey, commanding schooner Ready, 1889–1890. 1891.

pp. 179–209. 7 maps.

CONTENTS.—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.

20. The magnetic observations made on Bering's first voyage to the coasts of Kamchatka and eastern Asia in the years 1725 to 1730. Discussion by C. A. Schott, assistant. 1891.

pp. 211–214. Reprinted in Rept. 1890, app. 5.

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. 1890.

pp. 215–218. Reprinted in Rept. 1891, pt. 2, app. 2.

22. 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, 1889–1890. By E. D. Preston. 1891.

pp. 219–223. 1 map, 7 pl.

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 a discussion by C. A. Schott. 1891.

pp. 225–232.

24. Changes in the shore lines and anchorage areas of Cape Cod (or Provincetown) harbor, as shown by a comparison of surveys made between 1867 and 1890. By H. L. Marindin. 1891.

pp. 233–235.

25. Observations at Rockville, Md., for the variations of latitude in co-operation with the International geodetic association. I, Description of station, instruments, and methods of observing, by Edwin Smith, assistant. II, Reduction of the observations and discussion of results, by C. A. Schott, assistant. 1892.

pp. 237–261. 2 diag.

VOLUME II.†

Treasury department. United States Coast and geodetic survey. Henry S. Pritchett, superintendent. Bulletins. vol. II. Washington: Government printing office. 1899.

Nos. 26 to 35. 1893–1896. 170 pp. 1 map, 3 diag. 23½cm.

26. Fundamental standard of length and mass. By T. C. Mendenhall. 1893.
pp. 1–5.

27. Results of observations for the variations of latitude at Waikiki, Hawaiian islands, in co-operation with the work of the International geodetic association. By E. D. Preston. 1893.
pp. 6–20. 2 diag.

28. The constant of aberration as determined from a discussion of results for latitude at Waikiki, Hawaiian islands. By E. D. Preston. 1893.
pp. 21–34. 1 diag.

29. The methods and results of the U. S. Coast and geodetic survey as illustrated at the World's columbian exposition, 1893. 1893.
pp. 35–98.

30. Units of electrical measure. Approved for publication December 27, 1893. 1894.
pp. 99–104.

31. Legal units of electrical measure in the United States. Approved August 12, 1894. 1894.
pp. 105–108.

32. The constant of aberration as determined from observations of latitude at San Francisco, California. Discussion by E. D. Preston. Observations by George Davidson. 1895.
pp. 109–120.

33. The direction and intensity of the earth's magnetic force at San Francisco, California. By C. A. Schott. 1895.
pp. 121–126.

34. Distribution of the magnetic declination in Alaska and adjacent waters for the year 1895, with one chart. By C. A. Schott. 1895.
pp. 127–134.

35. Alaska. General information relating to the vicinity of Chatham and Peril straits, from a recent survey by the U. S. Coast survey steamer Patterson, Lieut. Commander E. K. Moore, U. S. N., commanding, and Cooks inlet and the region of the westward, by W. H. Dall, U. S. Geological survey. 1897.
pp. 135–170. 1 map.

VOLUME III.†

Treasury department. United States Coast and geodetic survey. O. H. Tittmann, superintendent. Bulletins. vol. III. Washington: Government printing office. 1902.

Nos. 36–40 (including edition 4 of no. 40). 1897–1900. Paging irregular. 9 maps, 5 pl.

36. Table of depths for channels and harbors, coasts of the United States. Arranged and compiled by Gershom Bradford, assistant. 1897.
pp. 1–109.

37. Alaska. Hydrographic notes and sailing directions relating to portions of Alaska from Dixon entrance to Yakutat bay, including reconnoissance surveys of Cordova bay, Bucarelli bay, and Red Fish bay. 1897. By Lieut. Commander J. F. Moser, U. S. N., commanding "Albatross." Published through the courtesy of the Fish commission. 1899.
pp. 110–118. 3 maps.

38. Alaska. Hydrographic notes, sailing directions, and charts of surveys relating to the vicinity of Prince William sound, Cook inlet, Kadiak island, and route from Unalaska to Chignik, through Unimak pass and inside the islands. 1897. By Lieut. Commander J. F. Moser, U. S. N., commanding "Albatross." Published through the courtesy of the Fish commission. 1899.
pp. 119–142. 6 maps.

39. Alaska. Predicted times of slack water at Seymour narrows, Discovery passage, B. C., and at Sergius narrows, Peril strait, Alaska, from May to December, 1899. Prepared from observations by Lieut. Commander E. K. Moore, U. S. N., assistant Coast and geodetic survey, commanding U. S. C. and G. S. steamer Patterson. 1899.
pp. 143–150.

† Not available for distribution in volume form.

40. Alaska. Coast pilot notes on the Fox islands passes, Unalaska bay, Bering sea, and Arctic ocean as far as Point Barrow. Prepared by the Coast and geodetic survey, and revised by Lieut. D. H. Jarvis, U. S. R. C. S. [First edition.] 1899.

pp. 151–204. 5 charts. Without index.
Ed. 2* issued April 2d, 1900. Paged independently. pp. 1–60, with index.
Ed. 3* issued April 6th, 1901. pp. 1–64, with index.
Ed. 4* issued April 15th, 1902. pp. 1–73, with index.

VOLUME IV.†

41. Magnetic survey of North Carolina. Values of the magnetic declination at the county seats from 1750 to 1910. Prepared by D. L. Hazard, computer, division of terrestrial magnetism. 1901.

pp. 1–12.

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* Exhausted. † Not available for distribution in volume form.

SPECIAL PUBLICATIONS.

This series contains publications on special subjects, which could not be conveniently included in the Annual Reports.

1. California, Bay of San Francisco. Magnetic ranges for determining the deviation of the compass, with short explanations of how to find the deviation and error of the compass. Arranged and compiled by Lieut. J. C. Gilmore, United States Navy, assistant U. S. Coast and geodetic survey. 1898.
   7 pp. 5 pl., 1 map. 23cm.

*2. Bibliography. Descriptive catalogue of publications relating to the U. S. Coast and geodetic survey, 1807–1896 and to U. S. Standard weights and measures, 1790 to 1896. 1898.
   118 pp. 23cm. For previous edition see Rept. 1891, app. 11, pp. 365–474.

*3. Atlas of the Philippine islands. Washington: Government printing office. 1900.
   24 pp. 30 maps. Bound in green cloth. The English title page is preceded by a title page in Spanish. "Atlas de Filipinas. Coleccion de 30 mapas. Trabajados por delineantes Filipinos bajo la direccion del P. José Algué, S. J., Director del observatorio de Manila. 1899."

   Also published as Senate doc. 138, 1st sess., 56th Cong. (Atlas to the Report of the first Philippine commission.) Also as supplementary part to the two volumes edition of "El Archipelago Filipino. Washington: Imprenta del Gobierno 1900."

4. The Transcontinental triangulation and the American arc of the parallel. By Assistant Chas. A. Schott, chief of the computing division.
   871 pp. 2 fig., 17 pl., 4 maps, 33 diag. 30cm. (Treas. dept. doc. 2173.)

   CONTENTS.—Unit of length, base lines and base nets; determination of heights of stations; triangulation and its connection with the base nets; result of the astronomic determinations of latitude, azimuth and longitude; the geographic positions and comparison of the astronomic and geodetic results; preliminary combination of American arcs for determining the earth's figure.

*5. Tables for a polyconic projection of maps, based upon Clarke's reference spheroid of 1866. Second edition. 1900.
   321 pp. 30cm. 1900. For first edition see Rept. 1884, app. 6, pp. 135–321.

6. Notes relative to the use of charts issued by the United States Coast and geodetic survey. By D. B. Wainright.
   23 pp. 1 fig., 1 pl., 6 diag. 24cm. 1900.

7. The Eastern oblique arc of the United States and osculating spheroid. By Chas. A. Schott, assistant, Coast and geodetic survey.
   394 pp. 12 pl., 2 maps, 25 diag. 30cm. 1902. (Treas. dept. doc. no. 2232, Coast and geodetic survey.)

   CONTENTS.—The base lines and base nets; main triangulation; astronomic measures; determination of an osculating spheroid for the region covered by the triangulation.

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* Exhausted.

SEPARATELY ISSUED PUBLICATIONS.

For various reasons papers have been published on a variety of professional, scientific, or historical subjects in separate form and without serial number. They are here listed from the beginning, in the order of their issue. Only a few of these have also been printed in the Annual Reports. They are special publications without a serial number.

These publications vary greatly in sizes and style of printing, the form being determined largely by the purpose they are intended to serve. Some of them, such as tables, etc., are printed on cardboard for use in the field; and others, such as star catalogues, larger in size, are printed and substantially bound with reference to similar use.

1850. Sailing directions to accompany the new chart of the western coast of the United States. A. D. Bache. [1850.]*

1851. Notes of the western coast of the United States. A. D. Bache. [1851.]*

1858. Special report on the comparative progress and expenditure of the Coast survey, in different years. Foreign surveys, etc. Washington. Printed by Henry Polkinhorn. 1858.*
18 pp. 22cm.

1861. Tides, currents, magnetic variation and geographic positions of light-houses. Chesapeake bay and its rivers. 1861. Prepared by Prof. Bache, assisted by Chas. A. Schott and L. F. Pourtales, assistants United States Coast survey.*
10 pp. 30cm.

1862. Standard mean right ascensions of circumpolar and time stars, prepared for the use of the U. S. Coast survey. B. A. Gould. First edition. Washington: Government printing office. 1862.*
15 pp. 30cm.

1866. Same. Ed. 2. 1866.*

1874. 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. Translated for the U. S. Coast survey. Washington: Government printing office. 1874.*
22 pp. 1 map. 29½cm.

Field catalogue of 983 transit stars. Mean places for 1870.0. G. Davidson. Washington: Government printing office. 1874.*
33 pp. 23cm.

The star-factors A, B, C for reducing transit-observations. 1874. G. Davidson. Washington: Government printing office. 1874.*
69 pp. 29½cm.

On the air contained in sea water. By Oscar Jacobsen. Republished for the U. S. Coast survey from Annales de chemie et de physique, vol. 167. 1873 [1874].*
16 pp. 29cm.

1876. On tides and tidal action in harbors. By J. E. Hilgard. Reprinted from Smithsonian report for 1874. Washington: Government printing office. 1876.*
22 pp. 23cm.

Papers relating to metric standards distributed to the states of the union under a joint resolution of Congress of July 27, 1866. Washington: Government printing office. 1876.*
6 pp. 23cm.
Signed by J. E. Hilgard, inspector of U. S. Standard weights and measures.

1877. Methods, discussions and results. Field work of the triangulation. R. D. Cutts. Washington: Government printing office. 1877.*
45 pp. 11 fig. 30cm.
Reprinted with additions from the Coast survey report for 1868. See also Report for 1882.

*Exhausted.

1879. Secular change of the magnetic declination in the United States and at some foreign stations. [By C. A. Schott.] Third edition, 1879.*
50 pp. 2 illus.
For other editions see Rept. 1855, app. 48.

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 Chas. D. Sigsbee, Lieut. Commander U. S. Navy, assistant in the U. S. C. S. Washington: Government printing office. 1880.*
221 pp. 8 fig., 35 pl., 16 diag. 29½cm.

1881. General properties of the equations of steady motion. Thos. Craig. Washington: Government printing office. 1881.*
26 pp. 29cm. (Treas. dept. doc. no. 71, C. & G. S.)

1882. A treatise on projections. By Thomas Craig. Part 1. Mathematical theory of projections. Part 2. Construction of projections. Washington: Government printing office. 1882.
xiv, 247 pp. 69 fig. 29½cm. (Treas. dept. doc. no. 61, C. & G. S.)

Carlile P. Patterson. In memoriam. [1882?]*
12 pp. 25cm.
Also published as app. 24, Rept. 1882.

1883. Original topographic and hydrographic sheets registered in the archives of the U. S. Coast and geodetic survey. Washington: Government printing office. 1883.*
70 pp. 30cm.

Letter of the Superintendent on the proposed transfer to the Navy department. January 6, 1883.*
8 pp. 23cm.

1884. Historical sketch of the U. S. Coast and geodetic survey. 1884.
8 pp. 23cm.

Short descriptions of articles forming the Coast and geodetic survey exhibit at the Cotton centennial exposition, New Orleans, La., 1884–85. Compiled and arranged by C. O. Boutelle. Washington: Government printing office. 1884.*
25 pp. 1 fig. 23cm.

1886. Logarithms of numbers, antilogarithms, etc. 1886.*
Cardboard leaf printed on both sides.

1887. Historical compilation. U. S. Coast and geodetic survey. [1887?]*
16 pp. 23cm.

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. Washington. R. O. Polkinhorn, printer, 1888.*
44 pp. 4 maps. 23cm.

1893. [The methods and results of the U. S. Coast and geodetic survey. Leaflets printed for distribution at the World's columbian exposition, Chicago, Ill. 1893.]
Issued separately. 18cm.
The U. S. Coast and geodetic survey. [By T. C. Mendenhall.] 4 pp.
Base apparatus. [By R. S. Woodward.] 4 pp.
Triangulation and reconnaissance. [By W. C. Hodgkins.] 4 pp.
Time, latitude, and longitude. [By C. H. Sinclair.] 4 pp.
Gravity. [By E. D. Preston.] 4 pp.
Magnetics. [By C. A. Schott.] 4 pp.
Topography. [By H. C. Whiting.] 4 pp.
Hydrography. [By Lieut. Com. S. M. Ackley, U. S. N.] 4 pp.
Tides and currents. [By A. S. Christie and E. E. Haskell.] 4 pp.
Hypsometry. [By Andrew Braid.] 4 pp.
Chart publications. [By H. G. Ogden.] 4 pp.
Weights and measures. [By O. H. Tittmann.] 4 pp.
Model of United States and Alaska. [By D. B. Wainwright.] 4 pp.
Description of the U. S. S. Blake and her deep sea apparatus. [By Lt. C. E. Vreeland, U. S. N.] 3 pp.

1900. Table of factors for computing differences in elevation (in feet). Table of corrections for curvature and refraction (in feet). Washington: Government printing office. 1900.
4 pp. 26½cm.

Table showing the height in meters, corresponding to given angles of elevation and distances in meters. Washington: Government printing office. 1900.
4 pp. 26½cm.

Table for converting customary and metric weights and measures. 1900.
4 pp. 26cm.

Table of coefficients for reducing inclined sights on vertical rod to horizontal distance. Washington: Government printing office. 1900.
4 pp. 26cm.

*Exhausted.

1901. Methods and results of the U. S. Coast and geodetic survey [Leaflets printed for distribution at the Pan-American exposition, Buffalo, N. Y.] 1901.
Issued separately. 18cm.

First edition printed May 1, 1901. Spanish edition of same date included all except Weights and measures. Second English edition dated August 1, 1901.

The U. S. Coast and geodetic survey. 5 pp.
Chart publications. 4 pp.
Base apparatus. 5 pp. 1 pl.
Triangulation and reconnaissance. 4 pp. 1 pl.
Geodesy or measurement of the earth. 5 pp.
Gravity. 4 pp. 1 pl.
Tides and tidal currents. 4 pp.
Coast pilots. 4 pp.
Topography. 4 pp.
Magnetics. 4 pp. 1 map.
Hydrography. 4 pp. 1 pl.
Time, latitude and longitude. 4 pp.
Leveling. 4 pp. 1 pl.
Weights and measures. 5 pp.

1902. United States magnetic declination tables and isogonic charts for 1902 and principal facts relating to the earth's magnetism. By L. A. Bauer, chief of division of terrestrial magnetism. Washington: Government printing office. 1902.
405 pp. 29 fig., 3 pl. 30cm.

CONTENTS.—Early history of the compass; birth of the science of terrestrial magnetism; the earth, a great magnet; magnetic observatories; magnetic charts; magnetic surveys; the earth's magnetic poles and moment; determination of the true meridian; determination of the magnetic declination; the secular change of the magnetic declination in the United States and outlying territories; the magnetic declination in the United States and outlying territories for January 1, 1902; table of the most recent declinations observed in the United States and outlying territories, reduced to January 1, 1902; descriptions of magnetic stations occupied by the Coast and geodetic survey between 1881 and June 30, 1902.

COAST PILOTS.

Coast Pilots were first begun as a series of publications in 1869. Previously to that coast pilot matters appeared from time to time in appendices to the annual reports. For a list of these appendices, see Coast Pilot in the catalogue.

The latest editions of the Coast Pilots are on sale at all of the chart agencies of the Survey, located in the principal cities on the coast. The Coast Pilots are now published under the following titles: United States Coast Pilot—Atlantic coast—Parts I–II to VIII, extending from Maine to Texas, inclusive. United States Coast Pilot—Pacific coast—California, Washington, and Oregon. United States Coast Pilot—Alaska—Part I.

Coast Pilot information relating to Bering Sea and the Arctic Ocean is also contained in Bulletin No. 40. Supplements to all the volumes are issued whenever new information makes it necessary, pending the revision of the volumes and the issue of a new edition. All volumes are corrected to date of issue by the Survey.

Pacific coast. Coast pilot of California, Oregon, and Washington territory. By George Davidson, assistant, Coast survey. 1869.*
262 pp. 33 illus. 30cm.

Pacific coast. Coast pilot of Alaska. (First part.) From southern boundary to Cook's inlet. By George Davidson, assistant, Coast survey. 1869.
251 pp. 8 illus. 30cm.

Coast pilot for the Atlantic sea-board. Gulf of Maine and its coast from Eastport to Boston. 1874. By J. S. Bradford, assistant. 1875.*
960 pp. 12 illus. 30cm.

Atlantic coast pilot. Boston bay to New York. 1878.
628 pp. 55 illus. 30cm.

Atlantic coast pilot. Boston bay to Monomoy. 1879.*
92 pp. 4 illus. 30cm.

Atlantic coast pilot. Nantucket and Vineyard sounds. 1879.*
107 pp. 7 illus. 30cm.

Atlantic coast pilot. Buzzard's and Narragansett bays. 1879.*
122 pp. 4 illus. 30cm.

Atlantic coast pilot. Block island and Fisher's island sounds, Gardiner's and Peconic bays. 1879.*
66 pp. 4 illus. 30cm.

Atlantic coast pilot. Long Island sound and East river. 1879.*
86 pp. 6 illus. 30cm.

Atlantic coast pilot. Harbors in Long Island sound. 1879.*
112 pp. 4 illus. 30cm.

Atlantic coast pilot. South coast of Long island, New York bay, and Hudson river. 1879.*
90 pp. 22 illus. 30cm.

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.

Atlantic coast pilot. Division A. Eastport to Boston. (Second edition.) 1879.
694 pp. 56 illus. 30cm.

Atlantic local coast pilot. Subdivision 1. Passamaquoddy bay to Schoodic. 1879.*
115 pp. 10 illus. 30cm.

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Atlantic local coast pilot. Subdivision 2. Frenchmans bay to Isle-au-haut. 1879.*
196 pp. 7 illus. 30cm.

Atlantic local coast pilot. Subdivision 3. Penobscot bay and tributaries. (First edition.) 1879.*
121 pp. 18 illus. 30cm.

Atlantic local coast pilot. Subdivision 4. White Head island to Cape Small Point. 1879.*
126 pp. 6 illus. 30cm.

Atlantic local coast pilot. Subdivision 5. Cape Small Point to Cape Ann. 1879.*
141 pp. 10 illus. 30cm.

Atlantic local coast pilot. Subdivision 6. Cape Ann to Cohasset. 1879.*
107 pp. 5 illus. 30cm.

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.

Pacific coast pilot. Coast and islands of Alaska. Second series. Appendix 1. Meteorology and bibliography. By W. H. Dall, assistant. 1879.
375 pp. 27 illus. 30cm.

Atlantic coast pilot. Division B. Boston to New York. (Second edition.) 1880.
675 pp. 53 illus. 30cm.

Atlantic local coast pilot. Subdivision 7. Boston to Monomoy. (Second edition.) 1880.*
86 pp. 5 illus. 30cm.

Atlantic local coast pilot. Subdivision 8. Nantucket and Vineyard sounds. (Second edition.) 1880.*
116 pp. 9 illus. 30cm.

Atlantic local coast pilot. Subdivision 9. Buzzard's and Narragansett bays. (Second edition.) 1880*.
131 pp. 5 illus. 30cm.

Atlantic local coast pilot. Subdivision 10. Block island and Fisher's island sounds; Gardiner's and Peconic bays. (Second edition.) 1880.*
70 pp. 5 illus. 30cm.

Atlantic local coast pilot. Subdivision 11. Long Island sound and East river. (Second edition.) 1880.*
92 pp. 6 illus. 30cm.

Atlantic local coast pilot. Subdivision 12. Harbors in Long Island sound. (Second edition.) 1880.
126 pp. 4 illus. 30cm.

Atlantic local coast pilot. Subdivision 13. South coast of Long Island, New York bay, and Hudson river. (Second edition.) 1880.*
95 pp. 21 illus. 30cm.

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.

Atlantic local coast pilot. Subdivision 14. New York to Delaware entrance. (First edition). 1882.*
95 pp. 13 illus. 30cm.

Atlantic local coast pilot. Subdivision 15. Delaware bay and tributaries. (First edition.) 1883*.
159 pp. 11 illus. 30cm.

Pacific coast pilot. Alaska. Part I. Coast from Dixon entrance to Yakutat bay, with the inland passage. 1883.*
342 pp. 53 illus. 30cm.

Atlantic local coast pilot. Subdivision 19. Cape Henry to Winyah bay, and inside passages. (First edition.) 1885.*
89 pp. 21 illus. 30cm.

Atlantic local coast pilot. Subdivision 20. Winyah bay to Savannah, with the inland passage to Fernandina. (First edition.) 1885.*
86 pp. 17 illus. 30cm.

Atlantic local coast pilot. Subdivision 13. South coast of Long Island, New York bay, and Hudson river. (Third edition.) 1886.*
99 pp. 8 illus. 30cm.

Atlantic local coast pilot. Subdivision 21. Tybee roads to Jupiter inlet. (First edition.) 1887.*
106 pp. 11 illus. 30cm.

Atlantic local coast pilot. Subdivision 6–7. Cape Ann to Monomoy. (Third edition.) 1888.
143 pp. 9 illus. 30cm.

United States coast pilot. Atlantic coast. Part IV. Long Island sound, with approaches and adjacent waters. (First edition.) 1888.*
155 pp. 15 illus. 30cm.

This volume takes the place of subdivisions 10, 11, and 12, Atlantic local coast pilot, and of pages 304–549 of division B, Atlantic coast pilot.

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*Exhausted.

United States coast pilot. Atlantic coast. Part VI. Chesapeake bay and tributaries. (First edition.) 1889.*
135 pp. 32 illus. 30cm.

Atlantic local coast pilot. Subdivision 22. Straits of Florida, Jupiter inlet to Dry Tortugas. (First edition.) 1889.*
95 pp. 2 illus. 30cm.

Pacific coast. Coast pilot of California, Oregon, and Washington. By George Davidson, assistant. (Fourth edition.) 1889.
721 pp. 457 illus. 30cm.

Pacific coast pilot. Alaska. Part I. Dixon entrance to Yakutat bay, with inland passage from the strait of Fuca to Dixon entrance. (Third edition.) 1891.
243 pp. 32 illus. 30cm.

United States coast pilot. Atlantic coast. Parts I—II. From the St. Croix river to Cape Ann. (First edition.) 1891.*
105, 96 pp. 18, 16 illus. 30cm.

United States coast pilot. Atlantic coast. Part IV. From Point Judith to New York. (Second edition.) 1892.*
156 pp. 13 illus. 30cm.

United States coast pilot. Atlantic coast. Part III. From Cape Ann to Point Judith. (First edition.) 1893.*
153 pp. 5 illus. 30cm.

Supplement to first edition. United States coast pilot. Atlantic coast. Part VI. Chesapeake bay and tributaries. 1894.*
8 pp. 30cm.

United States coast pilot. Atlantic coast. Part V. From New York to Chesapeake bay entrance. (First edition.) 1895.*
120 pp. 6 illus. 30cm.

United States coast pilot. Atlantic coast. Part VII. From Chesapeake bay entrance to Key West. (First edition.) 1895.*
157 pp. 7 illus. 30cm.

Supplement to first edition. United States coast pilot. Atlantic coast. Part V. From New York to Chesapeake bay entrance. 1895.*
9 pp. 30cm.

Supplement to second edition. United States coast pilot. Atlantic coast. Part IV. From Point Judith to New York. 1895.*
14 pp. 30cm.

Supplement to first edition. United States coast pilot. Atlantic coast. Part III. From Cape Ann to Point Judith. 1895.*
11 pp. 30cm.

Supplement to the first edition. United States coast pilot. Atlantic coast. Parts I and II. From the St. Croix river to Cape Ann. 1895.*
11 pp. 30cm.

Supplement to United States coast pilot. Atlantic coast. Part I–II, III, IV, V, VI, VII. 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). 1895.*
14 pp. 30cm.

Supplement to United States coast pilot. Atlantic coast. Parts I–II, III, IV, V, VI, VII. Rules of the road at sea and in harbors, rivers, and inland waters (except the Great Lakes and their connecting and tributary waters, as far east as Montreal). 1896.*
16 pp. 30cm.

Supplement to first edition. United States coast pilot. Atlantic coast. Part V. From New York to Chesapeake Bay entrance. 1897.*
16 pp. 30cm.

Supplement to second edition. United States coast pilot. Atlantic coast. Part IV. From Point Judith to New York. 1897.*
21 pp 30cm.

United States coast pilot. Atlantic coast. Part VIII. Gulf of Mexico, from Key West to the Rio Grande. (First edition.) 1897.*
143 pp. 5 illus. 30cm.

Supplement to first edition. United States coast pilot. Atlantic coast. Part VI. Chesapeake bay and tributaries. 1897.*
22 pp. 30cm.

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* Exhausted.

Supplement to United States coast pilot. Atlantic coast. Parts I–II, III, IV, V, VI, VII, VIII. Rules of the road at sea and in harbors, rivers, and inland waters (except the Great Lakes and their connecting and tributary waters as far east as Montreal, and the Red River of the North and rivers emptying into the Gulf of Mexico and their tributaries). 1897.*
20 pp. 30cm.

Supplement to first edition. United States coast pilot. Atlantic coast. Part VII. From Chesapeake bay entrance to Key West. 1897.*
19 pp. 30cm.

Supplement to first edition. United States coast pilot. Atlantic coast. Part V. From New York to Chesapeake bay entrance. 1897.*
16 pp. 30cm.

Supplement to first edition. United States coast pilot. Atlantic coast. Parts I–II. From the St. Croix river to Cape Ann. 1897.*
34 pp. 30cm.

Supplement to first edition. United States coast pilot. Atlantic coast. Part III. From Cape Ann to Point Judith. 1897.*
20 pp. 30cm.

Supplement to second edition. United States coast pilot. Atlantic coast. Part IV. From Point Judith to New York. 1897.*
31 pp. 30cm.

Supplement to first edition. United States coast pilot. Atlantic coast. Part VII. From Chesapeake bay entrance to Key West. 1898.*
20 pp. 30cm.

United States coast pilot. Atlantic coast. Part V. From New York to Chesapeake bay entrance. (Second edition.) 1898.*
129 pp. 4 illus. 30cm.

Supplement to third edition. Pacific coast pilot. Alaska. Part I. Dixon entrance to Yakutat bay, with inland passage from Strait of Fuca to Dixon entrance. 1898.*
37 pp. 30cm.

Supplement to United States coast pilot. Atlantic coast. Parts I–II, III, IV, V, VI, VII, VIII. Rules of the road at sea and in harbors, rivers, and inland waters (except the Great Lakes and their connecting and tributary waters as far east as Montreal, and the Red River of the North and rivers emptying into the Gulf of Mexico and their tributaries). 1898.*
20 pp. 30cm.
Reprint of 1897 edition.

Supplement to first edition. United States coast pilot. Atlantic coast. Part VI. Chesapeake bay and tributaries. 1898.*
23 pp. 30cm.

Supplement to first edition. United States coast pilot. Atlantic coast. Part VIII. Gulf of Mexico, from Key West to the Rio Grande. 1899.*
23 pp. 30cm.

Supplement to first edition. United States coast pilot. Atlantic coast. Part VI. Chesapeake bay and tributaries. 1899.*
21 pp. 30cm.

Supplement to first edition. United States coast pilot. Atlantic coast. Part I–II. From the St. Croix river to Cape Ann. 1899.*
26 pp. 30cm.

Supplement to first edition. United States coast pilot. Atlantic coast. Part III. From Cape Ann to Point Judith. 1899.*
18 pp. 30cm.

Supplement to first edition. United States coast pilot. Atlantic coast. Part VIII. Gulf of Mexico, from Key West to the Rio Grande. 1899.*
18 pp. 30cm.

United States coast pilot. Atlantic coast. Part IV. From Point Judith to New York. (Third edition.) 1899.
187 pp. 30cm.

Supplement to first edition. United States coast pilot. Atlantic coast. Part VI. Chesapeake bay and tributaries. 1900.*
24 pp. 30cm.

Supplement to first edition. United States coast pilot. Atlantic coast. Parts I–II. From the St. Croix river to Cape Ann. 1900.
27 pp. 30cm.

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* Exhausted.

Supplement to United States coast pilot. Atlantic coast. Parts I–II, III, VI, VIII. Rules of the road at sea, and in harbors, rivers, and inland waters (except the Great lakes and their connecting and tributary waters as far east as Montreal, and the Red river of the north and rivers emptying into the Gulf of Mexico and their tributaries). 1900.
20 pp. 30cm.
Reprint of 1897 edition. Also printed as an appendix to Parts IV, V, and VII.

United States coast pilot. Atlantic coast. Part VII. From Chesapeake bay entrance to Key West. (Second edition.) 1900.
189 pp. 6 illus. 30cm.

United States coast pilot. Atlantic coast. Part V. From New York to Chesapeake bay entrance. Second edition (reprint with supplement). 1901.
129 pp. 4 illus. 30cm.

Supplement to the reprint of second edition. United States coast pilot. Atlantic coast. Part V. From New York to Chesapeake bay entrance. 1901.
13 pp. 30cm.

United States coast pilot. Atlantic coast. Part VIII. Gulf of Mexico, from Key West to the Rio Grande. (Second edition.) 1901.
167 pp. 4 illus. 30cm.

United States coast pilot. Pacific coast. Alaska. Part I. Dixon entrance to Yakutat bay, with inland passage from Juan de Fuca strait to Dixon entrance. 1901.
246 pp. 14 illus. 30cm.

United States coast pilot. Atlantic coast. Part VI. Chesapeake bay and tributaries. 1902.
160, 8 pp. 1 illus. 30cm.

Supplement to United States coast pilot. Atlantic coast. Part VII. From Chesapeake bay entrance to Key West. 1902.
15 pp. 30cm.

Philippine islands. Sailing directions for the north and west coasts of Luzon, from Cape Engaño to Manila Bay. Bulletin compiled at the Coast and geodetic survey suboffice, Manila, P. I., from various sources of information. Manila, Bureau of public printing, 1902.
36 pp. 23cm.

NOTICE TO MARINERS.

The annual reports of the Survey previous to 1869 contained many Notices to Mariners 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 general distribution upon request, and are supplementary to the publications 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.

Pacific coast. Shoal off Cape Reyes, California. 1 p. July 12, 1869.*

Atlantic coast. East coast of Florida. St. Lucie shoal. 1 p. Jan. 22, 1872.*

Northwest coast of America. Aleutian islands. 1 p. June 20, 1874.*

Atlantic coast. Long Island sound. 1 p. Oct. 10, 1874.*

1. Atlantic coast. Sailing directions for St. Augustine harbor. 1 p. Jan. 14, 1875.*
2. Pacific coast. Sailing directions for Macks shelter, Oregon. 1 p. Jan. 26, 1875.*
3. Pacific coast. Sunken rock off the boundary of California and Oregon. 1 p. Feb. 10, 1875.*
4. Pacific coast. Additional peaks, Noonday rock, entrance to San Francisco bay, California. 1 p. May 4, 1875.*
5. Pacific coast. Sunken rock off Cape Mendocino, California. 1 p. May 7, 1875.
6. Pacific coast. Sunken rocks. San Luis Obispo bay, California. 1 p. May 20, 1875.*
7. Pacific coast. Shoal near South Farallon. 1 p. July 24, 1875.
8. Pacific coast. Dangerous shoal in the northern approach to San Miguel passage. 1 p. Sept. 4, 1875.
9. Atlantic coast. Approaches to Chesapeake bay. Wreck 12 miles to the southward and eastward of Cape Henry. 1 p. Sept. 20, 1875.*
10. Atlantic coast. Ledge in Delaware river. 1 p. 1 map. Nov. 4, 1875.*
11. Gulf of Mexico. Positions of wrecks at the entrance of Pensacola bay, Florida. 1 p. 1 map. Feb. 8, 1876.*
12. Atlantic coast. Chesapeake bay. Wreck off New Point Comfort, Virginia. 1 p. May 16, 1877.*
13. Atlantic coast. Wreck off Currituck beach, North Carolina. 1 p. Dec. 15, 1877.*
14. Gulf of Mexico. Observations upon northers and southeast gales. 2 pp. Dec. 21, 1877.
15. Gulf of Maine. Tidal currents at entrance. Mar. 7, 1878.

Same. Second edition. 4 pp. June 15, 1878.

16. Atlantic coast. Florida reefs. Disappearance of a beacon. 1 p. May 9, 1878.*
17. Atlantic coast. Nantucket sound. Wreck in Hyannis harbor. 1 p. July 16, 1878.*
18. Pacific coast. Depth of water over the bar at entrance of Wilmington harbor, California. 1 p. June 27, 1879.
19. Coast of Alaska. Location of Keen rock in the middle passage to Sitka harbor, Alaska. 1 p. June 27, 1879.
20. Atlantic coast. Closing of New Inlet, mouth of Cape Fear river, North Carolina. 1 p. June 27, 1879.
21. Atlantic coast. Increased depth of water at entrance to Cape Fear river, North Carolina. 1 p. July 9, 1879.*
22. Atlantic coast. Sunken wreck in the track of vessels running along the New Jersey coast. 1 p. July 14, 1879.*

* Exhausted.

23. Atlantic coast. Development of Johnsons rock, Casco bay, Maine. 1 p. July 25, 1879.

24. Atlantic coast. Dangerous rock near Isle of Wight shoal, coast of Maryland. 1 p. Oct. 14, 1879.

25. Atlantic coast. Development of Schuylers ledge, off Sakonnet point, Rhode Island. 1 p. Nov. 15, 1879.*

26. Pacific coast. Development of dangerous rocks near Fort Ross, California. 1 p. June 7, 1880.

27. Atlantic coast. Sunken wreck in entrance to Rappahannock river, Virginia. 1 p. Dec. 16, 1880.

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. 2 pp. Apr. 26, 1881.*

29. Atlantic coast. Connecticut. Breakwater in process of construction to the westward of Bartletts reef, Fishers Island sound. 1 p. Apr. 27, 1881.*

30. Atlantic coast. Sunken wreck off the east coast of Florida. 1 p. June 1, 1881.

31. Pacific coast. Reported dangers in the approaches to St. Paul harbor, Kadiak island, Alaska. 1 p. June 1, 1881.

32. Atlantic coast. New shoal. Frying-Pan shoals, off Cape Fear, North Carolina. 1 p. July 20, 1881.

33. Atlantic coast. Development of Fiske rock, Narragansett bay, Rhode Island. 1 p. Nov. 10, 1881.

34. Atlantic coast. Dangerous rock in eastern entrance to Fishers Island sound. 1 p. Aug. 24, 1882.

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. Atlantic coast. Dangerous rocks in western part of Fishers Island sound. Approaches to New London and Mystic harbors. 1 p. 1 map. Jan. 14, 1883.*

36. Atlantic coast. Sunken wreck in the track of vessels along the New Jersey coast. 1 p. May 14, 1883.

37. Atlantic coast. Wreck in the track of vessels along the east coast of Florida. 1 p. June 8, 1883.

38. Pacific coast. Discovery of a rock in Surge (or southern) narrows, Peril strait, southeast Alaska. 1 p. June 19, 1883.

39. Atlantic coast. Wreck in the track of coasting vessels off New Jersey. 1 p. June 22, 1883.

40. Atlantic coast. Dangerous rock off Warrens point, Rhode Island. 1 p. Oct. 31, 1883.

41. Atlantic coast. Dangerous rocks recently reported on the coast of Maine, near Muscongus and Booth bays. Wreck off Tarpaulin cove, Vineyard sound. 1 p. Nov. 9, 1883.

42. Atlantic coast. Rock reported in Eggemoggin reach, Maine. Rocks in East river, New York, near North Brother and Rikers islands. 1 p. Nov. 13, 1883.

43. Atlantic coast. Dangerous shoals off Cape Henlopen, Delaware. 1 p. Nov. 26, 1883.

44. Atlantic coast. Wreck in Potomac river, near Blackistone island. 1 p. Dec. 8, 1883.

45. Atlantic coast. Dangerous shoals in Monomoy passage. 1 p. Mar. 20, 1884.

46. Pacific coast. Notes on dangers in Neva and Peril straits and anchorages in Fish bay, southeast Alaska. 2 pp. May 27, 1884.

47. Atlantic coast. Dangerous ledges in Fishers island sound. 1 p. May 28, 1884.

48. Atlantic coast. Dangerous rock in East river, New York. 1 p. May 31, 1884.

49. Atlantic coast. Dangerous ledge in Englishmans bay, coast of Maine. 1 p. June 1, 1884.

50. Atlantic coast. Development of ledges off Minots ledge lighthouse, Massachusetts bay. 1 p. June 10, 1884.

51. Atlantic coast. Important changes at and near Cape Henlopen. 1 p. June 30, 1884.

52. Atlantic coast. Dangerous rock in East river, New York. 1 p. Aug. 11, 1884.

53. Changes in the pilotage laws of the port of New York. 1 p. Sept. 15, 1884.

54. Atlantic coast. Rocks recently reported on the coast of New England. 1 p. Oct. 7, 1884.

55. Atlantic coast. I. Dangerous ledges developed in the resurvey of Long Island sound. II. Ledge near Seal rock, Rhode Island. 1 p. Nov. 1, 1884.

56. Atlantic coast. Shoal developed in Vineyard sound. 1 p. Nov. 15, 1884.

57. Pacific coast. Discovery of a rock in Security bay, Kuiu island, Chatham strait, Alaska. 1 p. Nov. 15, 1884.*

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*Exhausted.

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. 1 p. Feb. 10, 1885.

59. Atlantic coast. Changes in main ship channel, Vineyard sound. 1 p. Mar. 23, 1885.

60. Pacific coast. Sailing directions for Wrangell strait, Alaska. 2 pp. Mar. 23, 1885.

61. Pacific coast. Sailing directions for inland passage between Sitka harbor and Hooniah sound, through Olga strait, Neva strait, and Peril strait, Alaska, 4 pp. June 12, 1885.

62. Gulf of Mexico. Shoal developed near Marquesas keys, Florida. 1 p. July 1, 1885.

63. Atlantic coast. Ledges developed in the resurvey of Long Island sound. 1 p. Aug. 24, 1885.

64. Atlantic coast. Dangerous rock developed in the resurvey of East river, New York. 1 p. Oct. 6, 1885.

65. Atlantic coast. Dangers developed in the resurvey of East river, New York. 1 p. Oct. 12, 1885.

66. Atlantic coast. Development of bar between Thatchers island and Milk island, Massachusetts. 1 p. Oct. 21, 1885.

67. Atlantic coast. Ledge developed in Boston bay, Massachusetts. 1 p. Oct. 21, 1885.

68. Atlantic coast. Dangers developed in the resurvey of East river, New York. 1 p. Nov. 20, 1885.

69. Atlantic coast. Important changes in Monomoy passage, Massachusetts. 1 p. Nov. 20, 1885.

70. Atlantic coast. Ledge developed in Fishers island sound, Connecticut. 1 p. Nov. 30, 1885.

71. Atlantic coast. Examination of dangers reported on the coast of Maine. 1 p. Dec. 7, 1885.

72. Coast of the United States. Chart corrections during the quarter ending March 31, 1886. 4 pp. Mar. 31, 1886.
This was the first number of the quarterly series of these notices, the publication of which was recommended by the hydrographic inspector.

73. Dangerous wreck on Charleston bar. 1 p. May 12, 1886.

74. Atlantic coast. Dangerous wreck on Charleston bar. (Addition to Notice to mariners, no. 73.) 1 p. May 21, 1886.

75. Atlantic coast. Danger developed in the resurvey of East river, New York. 1 p. May 31, 1886.

76. Coast of the United States. Chart corrections during the quarter ending June 30, 1886. 4 pp. June 30, 1886.*

77. Coast of the United States. Chart corrections during the quarter ending September 30, 1886. 4 pp. Sept. 30, 1886.

78. Atlantic coast. Velocity and direction of the Gulf stream between Fowey rocks, Florida, and Gun Cay, Bahamas. 1 p. Oct. 13, 1886.

79. Atlantic coast. Development of shoals off False cape, Virginia. 1 p. Oct. 15, 1886.

80. Atlantic coast. Ledges developed in the resurvey of Long Island sound. 1 p. Oct. 23, 1886.

81. Coast of the United States. Correction of an error in Notice to mariners, no. 77. 1 p. Nov. 8, 1886.

82. Atlantic coast. Ledge developed in East river, New York. 1 p. Dec. 1, 1886.

83. Coast of the United States. Chart corrections during the quarter ending December 31, 1886. 4 pp. Dec. 31, 1886.

84. Atlantic coast. Obstruction to navigation in the Gulf stream. 1 p. Jan. 8, 1887.*

85. Coast of the United States. Chart corrections during the quarter ending March 31, 1887. 5 pp. Mar. 31, 1887.

86. Atlantic coast. Dangerous sunken wreck in Long Island sound. 1 p. Apr. 16, 1887.

87. Atlantic coast. Shoal spot on rocky ledge off Eatons point, Long Island sound, New York. 1 p. June 9, 1887.

88. Coast of the United States. Chart corrections during the quarter ending June 30, 1887. 6 pp. June 30, 1887.

89. Coast of the United States. Chart corrections during the month of July, 1887. 2 pp. July 30, 1887.
With this number was begun the monthly series of these notices, as follows. They average three or four pages each.

90–92. Coast of the United States. Chart corrections for the months from August to October, 1887. 1887.

93. Atlantic coast. Dangerous rock in Vineyard sound, Massachusetts. Nov. 8, 1887.

94. Coast of the United States. Gulf stream currents. Nov. 22, 1887.

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* Exhausted.

95, 96. Coast of the United States. Chart corrections for the months of November and December, 1887. 1887.

‡Index to nos. 1 to 96.]

97. Coast of the United States. Coast currents approaching Sandy Hook. Jan. 9, 1888.

98. Coast of the United States. Chart corrections for the months from January to December, 1888. 1888.

‡Index to nos. 97 to 109. (1888.)

‡Index to chart corrections. January 1 to December 31, 1888.

110–113. Coast of the United States. Chart corrections for the months from January to April, 1889. 1889.

114. Atlantic coast. Off-shore current observations. Information of special importance to mariners. May 1, 1889.

115–117. Coast of the United States. Chart corrections for the months from May to July, 1889. 1889.

118. Information concerning U. S. Coast and geodetic survey charts. Aug. 15, 1889.

119–123. Chart corrections for the months from August to December, 1889. 1889.

Nos. 119–204 (inclusive except indexes) bear subtitle "Coast of the United States."

‡Index to chart corrections, 1889. January 1 to December 31.

124–135. Chart corrections for the months from January to December, 1890. 1890.

136. Index to chart corrections. January 1 to December 31, 1890. Dec. 31, 1890.

137–148. Chart corrections for the months from January to December, 1891. 1891.

149. Index to chart corrections January 1 to December 31, 1891. Dec. 31, 1891.

150–161. Chart corrections for the months from January to December, 1892. 1892.

162. Index to chart corrections January 1 to December 31, 1892. Dec. 31, 1892.

163–174. Chart corrections for the months from January to December, 1893. 1893.

175. Index to chart corrections January 1 to December 31, 1893. Dec. 31, 1893.

176–187. Chart corrections for the months from January to December, 1894. 1894.

188. Index to chart corrections January 1 to December 31, 1894. Dec. 31, 1894.

189–200. Chart corrections for the months from January to December, 1895. 1895.

201. Index to 1895. Chart corrections January 1 to December 31, 1895. Dec. 31, 1895.

202. Coast of the United States. Tidal indicator in Delaware river, Delaware. Jan. 27, 1896.

203–214. Coast of the United States and adjacent territories. Chart corrections for the months from January to December, 1896. 1896.

Nos. 205–280 (inclusive except indexes) bear subtitle "Coast of the United States and adjacent territories."

‡Index to 1896. Chart corrections January 1 to December 31, 1896. Jan., 1897.

215–226. Chart corrections for the months from January to December, 1897. 1897.

227. Index to 1897. Chart corrections January 1 to December 31, 1897. Jan., 1898.

228–239. Chart corrections for the months from January to December, inclusive, 1898. 1898.

240. Index to 1898. Chart corrections for the months January to December, inclusive, 1898. Jan., 1899.

241–252. Chart corrections for the months from January to December, 1899. 1899.

253. Index to 1899. Chart corrections January 1 to December 31, 1899. Jan., 1900.

254–265. Chart corrections for the months from January to December, 1900. 1900.

266. Index to 1900. Chart corrections January 1 to December 31, 1900. Jan., 1901.

267. Information affecting sailing directions for Delaware river. Jan. 16, 1901.

268–279. Chart corrections for the months from January to December, 1901. 1901.

280. Index to 1901. Chart corrections January 1 to December 31, 1901. Jan., 1902.

281–293. Coast of the United States, adjacent territories, and islands under the jurisdiction of the United States. Chart corrections January 1 to December 31, 1902.

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‡No number assigned.

PHILIPPINE ISLANDS.—NOTICE TO MARINERS.

[Seal of the Survey.] Treasury department. Philippine islands. Notice to mariners, advance publication, U. S. Coast and geodetic survey suboffice, Manila, P. I.

Printed on one side of the leaf. 24 cm.

A suboffice of the Survey was established in December, 1900, where information useful to mariners could be prepared and published. The following series of notices was promulgated to give prompt announcement of discoveries, etc., affecting Philippine charts. Copies are furnished mariners free of charge on application to the suboffice, room 16, Intendencia building (P. O. box 600), Manila.

Advance publication in the title above is omitted on no. 7, 1901, and subsequent issues.

1901.

1. [Sailing directions, etc.] pp. 1–3. Mar. 1.
2. [Sailing directions, etc.] pp. 4–7. Apr. 1.
3. [Sailing directions, etc.] pp. 8–12. July 1.
4. [Sailing directions, etc.] pp. 13–18. Aug. 1.
5. [Sailing directions, etc.] pp. 20–23. Sept. 16.
6. [Sailing directions, etc.] pp. 25–28. Oct. 5.
7. [Sailing directions, etc.] pp. 30–38. Nov. 8.
   Sketch of South Bais bay, Negros.
8. [Sailing directions, etc.] pp. 40–53. Dec. 24.
   Sketch of Maasin, Leyte.

1902.

1. [Sailing directions, etc.] pp. 1–6. Jan. 20.
   Sketch III, Halsey harbor, Culion.
2. [Sailing directions, etc.] pp. 7–10. Feb. 19.
   Sketch IV, Bogo bay, Cebu.
3. [Sailing directions, etc.] pp. 11–15. Mar. 1.
4. [Sailing directions, etc.] pp. 16–19. Apr. 9.
5. [Sailing directions, etc.] pp. 20–22. May 12.
6. [Sailing directions, etc.] pp. 23–27. June 26.
7. [Sailing directions, etc.] pp. 29–31. July 26.
8. [Sailing directions, etc.] pp. 32–34. Aug. 26.

TIDE TABLES.

Like many other publications of the Survey the Tide Tables were first issued as appendices to the reports. They were issued as an independent series in 1866. In that year the Tables were divided and issued separately for the Atlantic and Pacific coasts of the United States. In 1895 the Tables for the two coasts were combined into one volume from which was reprinted an edition for the Pacific coast, and, in 1901, a similar edition for the Atlantic coast. At present the Tide Tables also contain predictions for the principal foreign ports.

Tide tables for the United States [for the year 1854].
Rept. 1853, app. 26,* pp. 67–70.

Tide tables for the coast of the United States [for the year 1855].
Rept. 1854, app. 51,* pp. 180–189.

Tide tables for the use of navigators [for the year 1856], prepared from the Coast survey observations, by A. D. Bache, superintendent. (Prepared by authority of the Treasury department for E. and G. W. Blunt, New York.)
Rept. 1855, app. 53,* pp. 347–359.

Tide tables for the use of navigators [for the year 1857], prepared from the Coast survey observations, by A. D. Bache, superintendent.
Rept. 1856, app. 17,* pp. 120–133.

Tide tables for the use of navigators [for the year 1858], prepared from the Coast survey observations, by A. D. Bache, superintendent. (Furnished by authority of the Treasury department to E. and G. W. Blunt, New York, and revised Jan. 1857.)
Rept. 1857, app. 20,* pp. 157–184.

Tide tables for the use of navigators [for the year 1859], prepared from the Coast survey observations, by A. D. Bache, superintendent. (Furnished by authority of the Treasury department to E. and G. W. Blunt, New York, and revised October, 1858.)
Rept. 1858, app. 43,* pp. 275–297.

Tide tables for the use of navigators [for the year 1860], prepared from the Coast survey observations, by A. D. Bache, superintendent. (Furnished by authority of the Treasury department to E. and G. W. Blunt, New York, and revised October, 1859.)
Rept. 1859, app. 14,* pp. 136–167.

Tide tables for the use of navigators [for the year 1861], prepared from the Coast survey observations, by A. D. Bache, superintendent. (Furnished by authority of the Treasury department to E. and G. W. Blunt, New York, and revised October, 1860.)
Rept. 1860, app. 16,* pp. 131–164.

Tide tables for the use of navigators [for the year 1862], prepared from the Coast survey observations, by A. D. Bache, superintendent. (Furnished by authority of the Treasury department to E. and G. W. Blunt, New York, and revised May, 1861.)
Rept. 1861, app. 9,* pp. 98–131.

Tide tables for mariners [for the year 1863], prepared from the Coast survey observations, by A. D. Bache, superintendent. (Furnished by authority of the Treasury department to E. and G. W. Blunt, New York, and revised October, 1862.)
Rept. 1862, app. 8,* pp. 93–126.

Tide tables for the use of navigators [for the year 1864], prepared from the Coast survey observations, by A. D. Bache, superintendent. (Furnished by authority of the Treasury department to E. and G. W. Blunt, New York, and revised 1863.)
Rept. 1863, app. 12,* pp. 84–117.

Tide tables for the use of navigators [for the year 1865], prepared from the Coast survey observations, by A. D. Bache, superintendent. (Furnished by authority of the Treasury department to E. and G. W. Blunt, New York, and revised 1864.)
Rept. 1864, app. 8,* pp. 58–90.

[Tide tables for 1866 were not printed. All of the tables succeeding this date were printed at the Government printing office in each case during the year preceding the year from which the tables were predicted.]

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* Exhausted.

Tide tables for the Atlantic coast of the United States for the year 1867.* [A. D. Bache, superintendent.]
101 pp. 18cm.
Preface and specimen table is also printed as app. 7, Rept. 1866.

Tide tables for the Pacific coast of the United States for the year 1867.* [1866.]
32 pp. 18cm.

Tide tables for the Atlantic coast of the United States for the year 1868. [Benjamin Peirce, superintendent.]
109 pp. 18cm.

Tide tables for the Pacific coast of the United States for the year 1868.
58 pp. 18cm.

Tide tables for the Atlantic coast of the United States for the year 1869.*
110 pp. 18cm.

Tide tables for the Pacific coast of the United States for the year 1869.
58 pp. 18cm.

Tide tables for the Atlantic coast of the United States for the year 1870.*
111 pp. 18cm.

Tide tables for the Pacific coast of the United States for the year 1870.
59 pp. 18cm.

Tide tables for the Atlantic coast of the United States for the year 1871.
112 pp. 18cm.

Tide tables for the Pacific coast of the United States for the year 1871.
59 pp. 18cm.

Tide tables for the Atlantic coast of the United States for the year 1872.
119 pp. 18cm.

Tide tables for the Pacific coast of the United States for the year 1872.
59 pp. 18cm.

Tide tables for the Atlantic coast of the United States for the year 1873.
121 pp. 18cm.

Tide tables for the Pacific coast of the United States for the year 1873.
60 pp. 18cm.

Tide tables for the Atlantic coast of the United States for the year 1874.
122 pp. 18cm.

Tide tables for the Pacific coast of the United States for the year 1874.
60 pp. 18cm.

Tide tables for the Atlantic coast of the United States for the year 1875. [C. P. Patterson, superintendent.]
122 pp. 18cm.

Tide tables for the Pacific coast of the United States for the year 1875.
61 pp. 18cm.

Tide tables for the Atlantic coast of the United States for the year 1876.
109 pp. 18cm.

Tide tables for the Pacific coast of the United States for the year 1876.
61 pp. 18cm.

Tide tables for the Atlantic coast of the United States for the year 1877.
124 pp. 18cm.

Tide tables for the Pacific coast of the United States for the year 1877.
61 pp. 18cm.

Tide tables for the Atlantic coast of the United States for the year 1878.
124 pp. 18cm.

Tide tables for the Pacific coast of the United States for the year 1878.
61 pp. 18cm.

Tide tables for the Atlantic coast of the United States for the year 1879.
128 pp. 18cm.

Tide tables for the Pacific coast of the United States for the year 1879.
65 pp. 18cm.

Tide tables for the Atlantic coast of the United States for the year 1880.
129 pp. 18cm.

Tide tables for the Pacific coast of the United States for the year 1880.
65 pp. 18cm.

*Exhausted.

Tide tables for the Atlantic coast of the United States for the year 1881.
129 pp. 18cm.

Tide tables for the Pacific coast of the United States for the year 1881.
65 pp. 18cm.

Tide tables for the Atlantic coast of the United States for the year 1882. [J. E. Hilgard, superintendent.]
130 pp. 18cm.

Tide tables for the Pacific coast of the United States for the year 1882.
65 pp. 18cm.

Tide tables for the Atlantic coast of the United States for the year 1883.
130 pp. 18cm.

Tide tables for the Pacific coast of the United States for the year 1883.
66 pp. 18cm.

Tide tables for the Atlantic coast of the United States for the year 1884.
136 pp. 18cm.

Tide tables for the Pacific coast of the United States for the year 1884.
66 pp. 18cm.

Tide tables for the Atlantic coast of the United States for the year 1885.
136 pp. 18cm.

Tide tables for the Pacific coast of the United States for the year 1885.
66 pp. 18cm.

Tide tables for the Atlantic coast of the United States for the year 1886. [F. M. Thorn, superintendent.]
157 pp. 18cm. (Treas. dept. doc. 716.)

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 pp. 18cm. (Treas. dept. doc. 840.)

Tide tables for the Atlantic coast of the United States for the year 1887.
241 pp. 18cm. (Treas. dept. doc. 848.)

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 pp. 18cm. (Treas. dept. doc. 711.)

Tide tables for the Atlantic coast of the United States for the year 1888.
242 pp. 18cm. (Treas. dept. doc. 995.)

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 pp. 18cm. (Treas dept. doc. 1009.)

Tide tables for the Atlantic coast of the United States for the year 1889.
242 pp. 18cm. (Treas. dept. doc. 1081.)

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 pp. 18cm. (Treas. dept. doc. 1100.)

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. [T. C. Mendenhall, superintendent.]
237 pp. 27cm. (Treas. dept. doc. 1210.)

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 pp. 27cm. (Treas. dept. doc. 1233.)

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 pp. 27cm. (Treas. dept. doc. 1263.)

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 pp. 27cm. (Treas. dept. doc. 1306.)

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 pp. 27cm. (Treas. dept. doc. 1402.)

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 pp. 18cm. (Treas. dept. doc. 1425.)

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 pp. 27cm. (Treas. dept. doc. 1493.)

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 pp. 18cm. (Treas. dept. doc. 1513.)

Tide tables for the Atlantic coast of the United States, together with 207 stations in British America, for the year 1894.
253 pp. 27cm. (Treas. dept. doc. 1580.)

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 pp. 18cm. (Treas. dept. doc. 1581.)

Tide tables for the Atlantic coast of the United States, together with 207 stations in British America, for 1895. [W. W. Duffield, superintendent.]
257 pp. 27cm. (Treas. dept. doc. 1626.)

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 pp. 27cm. (Treas. dept. doc. 1661.)

Tide tables for the year 1896, by the U. S. Coast and geodetic survey.*
458 pp. 27cm. (Treas. dept. doc. 1781.)

Tide tables for the Pacific coast of the United States (reprinted from Tide tables for 1896), by U. S. Coast and geodetic survey, W. W. Duffield, superintendent.*
28 pp. 27cm.

Tide tables for the year 1897, by the U. S. Coast and geodetic survey, W. W. Duffield, superintendent.*
458 pp. 27cm. (Treas. dept. doc. 1854.)

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 pp. 27cm.

Tide tables for the year 1898, by the U. S. Coast and geodetic survey, W. W. Duffield, superintendent.
466 pp. 27cm. (Treas. dept. doc. 1914.)

Tide tables for the Pacific coast of the United States (reprinted from Tide tables for 1898), by the U. S. Coast and geodetic survey.*
44 pp. 27 cm.

Tide tables for the year 1899, by the U. S. Coast and geodetic survey, Henry S. Pritchett, superintendent.
470 pp. 27cm. (Treas. dept. doc. 2001.)

Tide tables for the Pacific coast of the United States (reprinted from Tide tables for 1899), by the U. S. Coast and geodetic survey.*
52 pp. 27cm.

Tide tables for the year 1900, by the U. S. Coast and geodetic survey, Henry S. Pritchett, superintendent.
487 pp. 27cm. (Treas. dept. doc. 2104.)

Tide tables for the Pacific coast of the United States (reprinted from Tide tables for 1900), by the U. S. Coast and geodetic survey.
62 pp. 27cm.

Tide tables for the year 1901, by the U. S. Coast and geodetic survey, Henry S. Pritchett, superintendent.
493 pp. 27cm. (Treas. dept. doc. 2172.)

Tide tables for the Atlantic coast of the United States (reprinted from Tide tables for 1901), by the U. S. Coast and geodetic survey.
152 pp. 27cm.

Tide tables for the Pacific coast of the United States (reprinted from Tide tables for 1901), by the U. S. Coast and geodetic survey.
66 pp. 27cm.

Tide tables for the year 1902, by the U. S. Coast and geodetic survey, O. H. Tittmann, superintendent.
492 pp. 27cm. (Treas. dept. doc. 2218.)

Tide tables for the Atlantic coast of the United States (reprinted from Tide tables for 1902), by the U. S. Coast and geodetic survey.
152 pp. 27cm.

Tide tables for the Pacific coast of the United States (reprinted from Tide tables for 1902), by the U. S. Coast and geodetic survey.
136 pp. 27cm.

Tide tables for the year 1903.
492 pp. 27cm. (Treas. dept. doc. 2267.)
Title preceded by departmental and survey heading on this volume and the two reprints. O. H. Tittmann, superintendent.

Tide tables for the Atlantic coast of the United States (reprinted from Tide tables for 1903).
152 pp. 27cm.

Tide tables for the Pacific coast of the United States (reprinted from Tide tables for 1903).
136 pp. 27cm.

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* Exhausted.

CATALOGUES OF MAPS AND CHARTS.

These began as one-page circulars, giving a list of the maps and charts engraved. The list was printed also as an appendix to the report, but was not arranged geographically until 1855. New and revised editions are issued whenever necessary, and include all of the charts that have been issued since 1850, except those superseded and canceled. Diagrams opposite each page show the limits of each chart.

List of the individual maps executed and delivered. 1843.*
1 p. 23^{cm}.
Describes 8 maps and charts published between 1835–1842.
In Report of Select committee on coast survey, H. rept. 43, 27th Cong., 3d sess. Published also as H. rept. 170, 27th Cong., 3d sess.
All of the lists to and including 1866 were issued under A. D. Bache, superintendent.

List of Coast survey maps engraved.
Rept. 1849, app. 2* bis, p. 70.
Describes 33 maps and charts published between 1842–1849.

List of Coast survey maps engraved.
Rept. 1850, app. 38,* pp. 131, 132.
Describes 43 maps and charts published between 1842–1850.

List of Coast survey maps, sketches, and preliminary charts, engraved and engraving.
Rept. 1851, app. 11,* pp. 160–162.
Describes 78 maps and charts published between 1842–1851.

List of Coast survey maps, sketches, and preliminary charts engraved and engraving.
Rept. 1852, app. 6,* pp. 81–83.
Describes 89 maps and charts published between 1842–1852.

List of Coast survey maps, sketches, and preliminary charts, engraved and engraving.
Rept. 1853, app. 5,* pp. 10–12.
Describes 129 maps and charts published between 1842–1853.

List of Coast survey maps, preliminary charts and sketches, engraved and engraving.
Rept. 1854, app. 31,* pp. 50–54.
Describes 147 maps and charts published between 1842–1854.

List of Coast survey maps, preliminary charts, and sketches engraved—geographically arranged.
Rept. 1855, app. 36,* pp. 238–242.
Describes 192 maps and charts published between 1842–1855.

List of Coast survey maps, preliminary charts, and sketches engraved—geographically arranged.
Rept. 1856, app. 19,* pp. 148–152.
Describes 221 maps and charts published between 1842–1856.

List of Coast survey maps, preliminary charts, and sketches engraved—geographically arranged.
Rept. 1857, app. 22,* pp. 205–210.
Describes 240 maps and charts published between 1842–1857.

List of Coast survey maps, preliminary charts, and sketches engraved—geographically arranged.
Rept. 1858, app. 19,* pp. 168–174.
Describes 260 maps and charts published between 1842–1858.

List of Coast survey maps, preliminary charts, and sketches engraved—geographically arranged.
Rept. 1859, app. 17*, pp. 192–199.
Describes 268 maps and charts published between 1842–1859.

List of Coast survey maps, preliminary charts, and sketches engraved—geographically arranged.
Rept. 1860, app 19,* pp. 199–205.
Describes 278 maps and charts published between 1842–1860.

List of Coast survey maps, preliminary charts, and sketches engraved—geographically arranged.
Rept. 1861, app. 12,* pp. 154–160.
Describes 290 maps and charts published between 1842–1861.

* Exhausted.

Catalogue of hydrographic maps, charts, and sketches published by the U. S. Coast survey, 1863.* Washington: Government printing office.
17 pp. 28cm.
Describes 242 maps and charts published between 1846–1863.
A. D. Bache, superintendent.

Catalogue of hydrographic maps, charts, and sketches published by the U. S. Coast survey, 1866.* Washington: Government printing office.
17 pp. 28cm.
Describes 242 maps and charts published between 1846–1864.
A. D. Bache, superintendent.

Catalogue of hydrographic maps, charts, and sketches published by the U. S. Coast survey, 1867.* Washington: Government printing office.
18 pp. 28cm.
Describes 276 maps and charts published between 1846–1867.
Benjamin Peirce, superintendent.

Catalogue of hydrographic maps, charts, and sketches published by the U. S. Coast survey, 1872.* Washington: Government printing office.
20 pp. 28cm.
Describes 278 maps and charts published between 1846–1872.
Benjamin Peirce, superintendent.

Catalogue of charts, 1875.* Washington: Government printing office.
28 pp. 28cm.
Describes 299 maps and charts published between 1851–1875.
Carlile P. Patterson, superintendent.

Catalogue of charts of the U. S. Coast survey, 1877.* Washington: Government printing office.
29 pp. 28cm.
Describes 325 maps and charts published between 1851–1877.
Carlile P. Patterson, superintendent.

Catalogue of charts, 1880.* Washington: Government printing office, 1880.
45 pp. 28cm.
Describes 409 maps and charts published between 1846–1880.
Carlile P. Patterson, superintendent.

Catalogue of charts, 1883.* Washington: Government printing office, 1883.
64 pp. 28cm.
Describes 389 maps and charts published between 1846–1883.
J. E. Hilgard, superintendent.

Catalogue of charts, 1884.* Washington: Government printing office, 1884.
68 pp. 28cm.
Describes 384 maps and charts published between 1846–1884.
J. E. Hilgard, superintendent.

Catalogue of charts, 1886.* Washington: Government printing office, 1886.
72 pp. 28cm.
Describes 395 maps and charts published between 1846–1886.
F. M. Thorn, superintendent.

Catalogue of charts and other publications, 1887.* Washington: Government printing office, 1887.
140 pp. 28cm.
Describes 458 maps and charts published between 1846–1887.
F. M. Thorn, superintendent.

Catalogue of charts and other publications, 1890.* Washington: Government printing office, 1890.
156 pp. 28cm.
Describes 476 maps and charts published between 1846–1890.
T. C. Mendenhall, superintendent.

Catalogue of charts and other publications, 1892.* Washington: Government printing office, 1892.
152 pp. 28cm.
Describes 489 maps and charts published between 1846–1892.
T. C. Mendenhall, superintendent.

Catalogue of charts and other publications, 1893.* Washington: Government printing office, 1893.
148 pp. 28cm.
Describes 497 maps and charts published between 1846–1893.
T. C. Mendenhall, superintendent.

Catalogue of charts and other publications, 1894.* Washington: Government printing office, 1893.
148 pp. 28cm.
Describes 516 maps and charts published between 1846–1894.
W. W. Duffield, superintendent.

Catalogue of charts and other publications, 1896.* Washington: Government printing office, 1896.
142 pp. 28cm.
Describes 520 maps and charts published between 1846–1896.
W. W. Duffield, superintendent.

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*Exhausted.

Catalogue of charts, coast pilots, and tide tables, 1897* Washington: Government printing office, 1897. 140 pp. 28cm.

Describes 549 maps and charts published between 1849–1897.
W. W. Duffield, superintendent.

Catalogue of charts, coast pilots, and tide tables, 1899.* Washington: Government printing office, 1899. 142 pp. 28cm.

Describes 579 maps and charts published between 1850–1899.
Henry S. Pritchett, superintendent.

Catalogue of charts, coast pilots, and tide tables, 1900.* Washington: Government printing office, 1900. 150 pp. 28cm.

Describes 587 maps and charts published between 1850–1900.
Henry S. Pritchett, superintendent.

Catalogue of charts, coast pilots, and tide tables, 1902. Washington: Government printing office, 1902. 167 pp. 28cm.

Describes 656 maps and charts published between 1850–1902.
Includes new sections for the West Indies and the Philippines in the geographical arrangement.
Title preceded by departmental and survey heading, O. H. Tittmann, superintendent.

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* Exhausted.

ADMINISTRATIVE PUBLICATIONS.

Laws and regulations.
Directions in regard to operations.
Instructions in methods of work.
Reports submitting estimates.
Summary or abstract report.
Official reports of expenditures.

LAWS AND REGULATIONS.*

General rules for estimates, accounts, and classification of expenditures for the guidance of the chiefs of parties of the U. S. Coast survey, 1858. Public printer, June, 1858.
8 pp. 22½cm.
Signed by Samuel Hein, disbursing agent.

Laws relating to the Survey of the coast of the United States, with the plan of reorganization of 1843, and regulations by the Treasury department. Public printer, July, 1858.
25 pp. 22½cm.

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. Washington: Government printing office, 1869.
27 pp. 19½cm.

General rules for estimates, accounts, and classification of expenditures for the guidance of the chiefs of parties of the United States Coast survey, 1874.
7 pp. 22cm.
Signed by Samuel Hein, disbursing agent.

Laws and regulations relating to the Coast and geodetic survey of the United States. Washington: Government printing office, 1881.
42 pp. 23cm.

Laws of general application for use of the United States Coast and geodetic survey. Washington: Government printing office, 1881.
52 pp. 23cm. (Treas. dept. doc. no. 167, C. & G. S.)

Laws and regulations relating to the Coast and geodetic survey of the United States. Washington: Government printing office, 1887.
59 pp. 23cm.

Regulations for enlistments, discharges, etc., May 5, 1899.
7 pp. 23½cm. (Treas. dept. doc. no. 2112, C. & G. S.)
Signed by H. S. Pritchett, superintendent.

Rules governing routine and discipline aboard ship, 1899. Washington: Government printing office, 1899.
14 pp. 23cm.
Signed by H. S. Pritchett, superintendent.

DIRECTIONS IN REGARD TO THE OPERATIONS OF THE COAST SURVEY.*

Directions of the Treasury department in regard to the operations of the Coast survey for 1844–'45.
8 pp. 23cm.

Directions in regard to the operations of the Coast survey, for 1846–47. Approved by the Treasury department, March, 1846.
10 pp. 23cm.

* Exhausted.

Directions in regard to the operations of the Coast survey, for 1847–48. Approved by the Treasury department, March, 1847.
10 pp. 23cm.

Directions in regard to the operations of the Coast survey, for 1848–49. Approved by the Treasury department, April, 1848.
12 pp. 23cm.

Directions in regard to the operations of the Coast survey, for 1849–50. Approved by the Treasury department, March 23, 1849.
14 pp. 23cm.
[It is probable that this publication was also issued in 1850–51, 1851–52 and 1852–53.]

Directions in regard to the operations of the Coast survey, for 1853–54. Approved by the Treasury department, June 1, 1853.
27 pp. 23cm.

Directions in regard to the operations of the Coast survey, for 1854–55. Approved by the Treasury department, 1854.
26 pp. 23cm.

Directions in regard to the operations of the Coast survey, for 1855–56. Approved by the Treasury department, 1855.
27 pp. 23cm.

Directions in regard to the operations of the Coast survey, for 1856–57. Approved by the Treasury department, 1855.
28 pp. 23cm.

Directions in regard to the operations of the Coast survey, for 1857–58. Approved by the Treasury department, 1857.
27 pp. 23cm.

Directions in regard to the operations of the Coast survey, 1858–59. Approved by the Treasury department, 1858.
26 pp. 23cm.

Directions in regard to the operations of the Coast survey, 1859–60. Approved by the Treasury department, 1859.
26 pp. 23cm.

Directions in regard to the operations of the Coast survey, 1860–61. Approved by the Treasury department, 1860.
27 pp. 23cm.

INSTRUCTIONS IN METHODS OF WORK.

Directions for observations of tides.* Printed for the use of the tidal observers from the manuscript instructions, 1852. Gideon & Co., printers.
12 pp. 2 illus.

Self-registering tide gauge. Instructions for observers, 1859.*
16 pp. 23cm.
Signed by A. D. Bache, superintendent.

General instructions in regard to the hydrographic work of the Coast survey.* (Printed for the use only of the hydrographic parties.) [1861?]
28 pp. 23cm.
Signed by A. D. Bache, superintendent.

General instructions in regard to inshore hydrographic work of the Coast survey, 1878.* Washington: Government printing office, 1878.
50 pp. 23cm.
Signed by C. P. Patterson, superintendent.

General instructions for hydrographic work, 1883.* Washington: Government printing office, 1883.
81 pp. 2 fig., 5 diag. 23cm.
Signed by J. E. Hilgard, superintendent.

Instructions and memoranda for descriptive reports to accompany original sheets. Washington: Government printing office, 1887.
9 pp. 23cm. (Reprinted from Report 1887, app. 11.)
Signed by F. M. Thorn, superintendent.

General instructions for hydrographic parties, 1894.* Washington: Government printing office, 1894.
111 pp. 1 fig., 11 diag. 23cm. (Treas. doc. no. 1655, C. & G. S.)
Signed by T. C. Mendenhall, superintendent.

[Amendment to] General instructions for hydrographic parties, 1894.* [Issued] July 1, 1895.
8 pp., printed on one side of the leaf. 23cm. (Circular no. 1.)
Signed by T. C. Mendenhall, superintendent.

*Exhausted.

REPORT SUBMITTING ESTIMATES.*

Extract from the report of the Superintendent of the coast survey, showing the progress of the work during the year ending November, 1845. J. & G. S. Gideon, printers.
9 pp. 23cm.
Signed by A. D. Bache, superintendent.

United States Coast survey. [Report submitting estimates.] 1859.
15 pp. 23cm.
Signed by A. D. Bache, supt. coast survey, Oct. 27, 1859.

United States Coast survey. [Report submitting estimates.] 1860.
14 pp. 23cm.
Signed by A. D. Bache, superintendent coast survey, station near Fitchburg, Mass., Oct. 15, 1860.

United States Coast survey. [Report submitting estimates.] 1861.
8 pp. 23cm.
Signed by A. D. Bache, superintendent, New York, Nov. 5, 1861.

United States Coast survey. [Report submitting estimates.] 1862.
9 pp. 23cm.
Signed by A. D. Bache, superintendent, station near West Chester, Conn.
[It is probable that a report submitting estimates was issued for 1863, 1864, 1865, 1866, 1867, 1868, 1869.]

Report of the Superintendent of the coast survey, September, 1870.
12 pp. 23cm.
Signed by Benjamin Peirce, superintendent, Washington, Sept. 28, 1870.

Estimates of the Superintendent, U. S. Coast survey, 1870–71.
7 pp. 23cm.
Signed by Benjamin Peirce, superintendent, Washington, Sept. 30, 1869.

Report of the Superintendent of the United States coast and geodetic survey for the fiscal year ending with June, 1882. Washington: Government printing office, 1882.
18 pp. 23cm. (Treas. dept. doc. 364.)
Signed by J. E. Hilgard, superintendent, Washington, Dec. 2, 1882.

ABSTRACT OR SUMMARY REPORT.*

This report is annually prepared in the office of the Survey for incorporation in the report of the Secretary of the treasury. It is not printed separately, although the two following were issued in pamphlet form with a separate document number.

Summary report of the progress of the United States Coast and geodetic survey for the fiscal year ending with June, 1883. Washington: Government printing office, 1884.
21 pp. 23cm. (Treas. dept. doc. 541.)
Signed by J. E. Hilgard, superintendent, Washington, Dec. 10, 1883.

Summary report of the progress of the United States Coast and geodetic survey for the fiscal year ending with June, 1884. Washington: Government printing office, 1884.
20 pp. 23cm. (Treas. dept. doc. 652.)
Signed by J. E. Hilgard, superintendent, Washington, November 15, 1884.

OFFICIAL REPORTS OF EXPENDITURES.

Report by the Secretary of the treasury of the expenditures for the Survey of the United States coast. January 25, 1842.
8 pp. 23cm. (H. doc. 57, 27th Cong., 2d sess.)

Report of Select committee on the result of an examination of the progress and expenditure of the Coast survey. January, 1843.
103 pp. 23cm. (H. rept. 43, 27th Cong., 3d sess.)

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 pp. 23cm. (H. rept. 170, 27th Cong., 3d sess.)

Report by the Secretary of the treasury on appropriations for the Coast survey. December 22, 1848.
2 pp. 23cm. (S. ex. doc. 4, 30th Cong., 2d sess.)

Report of Secretary of the treasury regarding Coast survey expenditures and results. February 7, 1849.
111 pp. 23cm. (S. ex. doc. 26, 30th Cong., 2d sess. In v. 3.)

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 pp. 23cm. (S. ex. doc. 29, 30th Cong., 2d sess. In v. 3.)

*Exhausted.

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 compensation and service, with expenditures made under his direction. December 25, 1853.
16 pp. 23cm. (S. doc. 11, 33d Cong., 1st sess. In v. 4.)

Letter from the Secretary of the treasury transmitting a list of the names of persons employed in the Coast survey. December 22, 1853.
16 pp. 23cm. (H. ex. doc. 13. 33d Cong., 1st sess.)

Secretary of the treasury transmits reports showing disbursements in behalf of the Coast survey. December 27, 1854.
10 pp. 23cm. (H. ex. doc. 23, 33d Cong., 2d sess. In v. 5.)

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 pp. 23cm. (H. ex. doc. 44, 34th Cong., 1st sess. In v. 9.)

Letter from the Secretary of the treasury transmitting a report showing the number and names of persons employed in the Coast survey, etc. December 22, 1856.
12 pp. 23cm. (H. ex. doc. 17, 34th Cong., 3d sess.)

Letter from the Secretary of the treasury transmitting report showing the number and names of persons employed in the Coast survey, together with a statement of expenditures, etc. February 6, 1856.
12 pp. 23cm. (H. ex. doc. 44, 34th Cong., 1st sess.)

Secretary of the treasury transmits list of persons employed in Coast survey and expenditures for year ending June 30, 1857. January 15, 1858.
12 pp. 23cm. (H. ex. doc. 20, 35th Cong., 1st sess. In v. 3.)

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.
28 pp. 23cm. (S. rept. 6, 35th Cong.. 2d sess. In v. 6.)

Report by Secretary of the treasury of names and salaries of persons employed on the Coast survey. January 7, 1859.
13 pp. 23cm. (H. ex. doc. 29, 35th Cong., 2d sess. In v. 5.)

Letter from the Secretary of the treasury transmitting list of persons employed in the Coast survey. February 8, 1860.
12 pp. 23cm. (H. ex. doc. 9, 36th Cong., 1st sess.)

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 pp. 23cm. (Ex. doc. 15, 26th Cong., 2d sess. In v. 6.)

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 pp. 23cm. (H. ex. doc. 68, 37th Cong., 2d sess. In v. 5.)

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 pp. 23cm. (H. ex. doc. 83, 37th Cong., 2d sess. In v. 7.)
Date of letter Mar. 21, 1862.

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 pp. 23cm. (H. ex. doc. 13, 38th Cong., 1st sess. In v. 7.)

Report of Secretary of the treasury transmitting list of employees, with compensations and statement of expenditures of Coast survey for fiscal year ending June 30, 1864. December 21, 1864.
9 pp. 23cm. (H. ex. doc. 13, 38th Cong., 2d sess. In v. 8.)

Report of Secretary of treasury transmitting a statement of employees in the Coast survey during the year ending June 30, 1865.
9 pp. 23cm. (H. ex. doc. 24, 39th Cong., 1st sess. In v. 7.)

Report by Secretary of the treasury transmitting list of employees of Coast survey with compensations, etc., for the fiscal year ending June 30, 1886. December 15, 1866.
10 pp. 23cm. (H. ex. doc. 15, 39th Cong., 2d sess. In v. 6.)

Report by Secretary of the treasury on expenses of the Coast survey for the year ending June 30, 1867. May 8, 1868.
9 pp. 23cm. (H. ex. doc. 286, 40th Cong., 2d sess. In v. 17.)

Report by Secretary of the treasury transmitting list of employees, with compensations, and statement of expenditures of Coast survey for fiscal year ending June 30, 1869. January 22, 1870.
8 pp. 23cm. (H. ex. doc. 75, 41st Cong., 2d sess. In v. 6.)

Report by Secretary of the treasury transmitting list of employees of the Coast survey, with compensations, during fiscal year ending June 30, 1870. February 25, 1871.
9 pp. 23cm. (H. ex. doc. 142, 41st Cong., 3rd sess. In v. 12.)

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* Exhausted.

Report of Secretary of the treasury transmitting list of Coast survey employees for year ending June 30, 1874. December 23, 1874.
8 pp. 23cm. (H. ex. doc. 71, 43d Cong., 2d sess. In v. 12.)

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 pp. 23cm. (H. ex. doc. 40, 45th Cong., 3d sess. In v. 16.)

Letter from the Secretary of the Treasury in response to a resolution of the House of Representatives concerning the present organization of the Coast and geodetic survey. February 3, 1879.
6 pp. 23cm. (H. ex. doc. 62, 45th Cong., 3d sess.)

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 pp. 23cm. (H. ex. doc. 68, 46th Cong., 2d sess. In v. 24.)

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 pp. 23cm. (H. ex. doc. 64, 46th Cong., 3d sess. In v. 18.)

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 pp. 23cm. (Treas. dept. doc. 364.)

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 pp. 23cm. (H. ex. doc. 63, 48th Cong., 1st sess.)

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 pp. 23cm. (H. ex. doc. 52, 48th Cong., 2d sess.)

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 pp. 23cm. (H. ex. doc. 32, 49th Cong., 1st sess.)

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 pp. 23cm. (H. ex. doc. 149, 49th Cong., 2d sess.)

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 pp. 23cm. (H. ex. doc. 154, 50th Cong., 1st sess.)

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 pp. 23cm. (H. ex. doc. 53, 50th Cong., 2d sess.)

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 pp. 23cm. (H. ex. doc. 90, 51st Cong., 1st sess.)

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 pp. 23cm. (H. ex. doc. 278, 51st Cong., 2d sess.)

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 pp. 23cm. (H. ex. doc. 151, 52d Cong., 1st sess.)
Also published as office report no. 3, Annual report, 1891.

Letter from the Secretary of the treasury transmitting in response to resolution of the 21st inst., information relative to the changes made in the force of employees in the Coast and geodetic survey during the year 1890. March 28, 1892.
8 pp. 23cm. (H. ex. doc. 180, 52d Cong., 1st sess.)

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 pp. 23cm. (H. ex. doc. 253, 52d Cong., 2d sess.)
Also published as office report no. 3, Annual report, 1892.

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 pp. 23cm. (H. ex. doc. 157, 53d Cong., 2d sess.)
Also published as office report no. 3, Annual report, 1893.

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 pp. 23cm. (H. ex. doc. 324, 53d Cong., 3d sess.)
Also published as office report no. 3, Annual report, 1894.

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 pp. 23cm. (H. ex. doc. 402, 54th Cong., 1st sess.)
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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 pp. 23cm. (H. ex. doc. 155, 54th Cong., 2d sess.)
Also published as office report no. 3, Annual report, 1896.

Letter from the Secretary of the treasury transmitting a statement of expenditures in the United States Coast and geodetic survey for the fiscal year ended June 30, 1897.
20 pp. 23cm. (H. ex. doc. 230, 55th Cong., 2d sess.)
Also published as office report no. 3, Annual report, 1897.

Letter from the Secretary of the treasury, transmitting a statement of the expenditures in the United States Coast and geodetic survey for the year ended June 30, 1898.
22 pp. 23cm. (H. ex. doc. 215, 55th Cong., 3d sess.)
Also published in Annual report of this year.

Letter from the Acting secretary of the treasury, transmitting a statement of expenditures in the United States Coast and geodetic survey for the year ended June 30, 1899.
22 pp. 23cm. (H. ex. doc. 436, 56th Cong., 1st sess.)
Also published in Annual report of this year.

Letter from the Secretary of the treasury, transmitting a statement of the expenditures in the United States Coast and geodetic survey for the year ended June 30, 1900.
18 pp. 23cm. (H. ex. doc. 465, 56th Cong., 2d sess.)
Also published in Annual report of this year.

Letter from the Acting secretary of the treasury, transmitting a statement of the expenditures in the United States Coast and geodetic survey for the year ended June 30, 1901.
20 pp. 23cm. (H. ex. doc. 171, 57th Cong., 1st sess.)
Also published in Annual report of this year.

PART II.—CATALOGUE.

CLASSIFICATION OF SUBJECT HEADINGS.

This list of subject headings, arranged in logical, systematic order, will enable those who wish to see all the entries on any subject or group of subjects to refer readily to the proper places in the alphabetical arrangement. All of the entries in this catalogue appear under the subjects here given. To this extent only is the classification exhaustive.

GEODESY.

GENERAL.

Arc measures.
Constitution of the earth.
Ellipticity of the earth.
    Spheroid.
Figure of the earth.
Plumb line deflection.
Gravity.
    Pendulum.
Geodetic conferences.
    International geodetic association.
Instruments.

ASTRONOMY.

Geographic positions.
Azimuth.
Latitude.
    Latitude variation.
Longitude.
    Longitude (telegraphic).
    Moon culminations.
    Lunar distances.
    Lunar spots.
    Lunar tables.
    Occultations.
    Star transits.
        Transit errors.
Time.
    Star factors.
Stars.
    Declination.
    Polaris.
    Star catalogues.
Eclipses.
Mars.
Mercury, Transit of.
Moon.
Sun.
    Sun spots.

ASTRONOMY—continued.

Venus, Transit of.
Personal equation.
Instruments.
    Artificial horizons.
    Chronograph.
    Longitude instrument.
    Meridian instrument.
        Meridian telescope.
    Personal equation apparatus.
    Transit instrument.
    Zenith telescope.

TRIANGULATION.

Reconnaissance.
Base measurement.
    Base measures.
    Base measuring apparatus.
Horizontal measures.
    Signals.
    Intervisibility.
    Theodolite.
        Micrometer.
Vertical measures.
Adjustment.
Geographic positions.

HYPSOMETRY.

Leveling.
    Leveling instruments.
    Leveling rods.
Elevations.
    Bench marks.
    Sea level.
    Water levels.
Vertical measures.
Barometric hypsometry.

HYDROGRAPHY.

Hydrographic surveying.
- Hydrographic reconnaissance.
- Hydrographic sheets.
- Coast pilot (sailing directions).

Sounding.
- Depths.
- Sounding apparatus.

Tides.
- Cotidal lines.
- Earthquake waves.
- Harbors.
- Moon.
- Elevations.
  - Bench marks.
  - Sea level.
  - Water level.
- Mathematics.
  - Equilibrium theory of tides.
  - Harmonic analysis.
- Instruments.
  - Tide tables.
  - Tide indicator.
  - Tide gauge.
  - Tide predicting machine.

Currents.
- Current float.
- Current meter.

Physical hydrography.
- Anchorages.
- Bars.
- Channels.
- Coast features.
- Harbors.
- Oyster beds.
- Rivers.
- Sea level.
- Shoals.
- Shore line changes.
- Tide lands.
- Wind effects on water.

Oceanography.
- Ocean depths.
  - Depth recorder.
- Ocean temperatures.
- Sea water.
  - Sea water densities (salinity).
    - Hydrometer (densimeter).
- Sea bottom.
  - Dredging.
  - Dredging apparatus.

TOPOGRAPHY.

Topographic conference.
Topographic sheets.
Topographic instruments.
- Plane table.
- Interranger.

Three point problem.
Surveying.
- Surveys.
  - Land surveys.

Phototopography.

TERRESTRIAL MAGNETISM.

Magnetic elements.
Magnetic declination.
- Meridian lines.

Magnetic inclination.
Magnetic intensity.
Magnetic variations.
- Magnetic variations (secular).

Magnetic surveys.

Magnetic methods.
Magnetic instruments.
- Dip instrument.
- Magnetic needle.
- Magnetometer.

Magnetic observatories.
Auroras.
Atmospheric electricity.

CHART CONSTRUCTION.

Projections.
- Projection tables.

Drawing.
- Paper.
- Lettering.
- Shading.
- Pantograph.

Photography.

Engraving.
- Etching.
- Lithography.
  - Lithographic transfers.

Electrotyping.
Printing.
- Paper.

Cartography.
- Charts.
- Maps.

ALLIED SUBJECTS.

MATHEMATICS AND COMPUTATION.

Arithmetic.
Equations, solution of.
Functions.
Harmonic analysis.
Interpolation.
Least square method.
N point problem.
Projections.
Tables.
Three point problem.
Trajectory of shot.

PHYSICS.

Aberration.
Expansion.
Electricity.
  Electro-magnetism.
  Transmission time.
Hydraulics.
Motion.
  Viscous fluid.
Refraction.
Spectrum.

STANDARDS.

Balances.
Kilogram.
Meter.
  Metric tables.
Mile.
Weights and measures office.
Yard.

GEOGRAPHY.

Boundaries.
Eminent domain.
Expeditions.
Geographic exploration.
Geographic names.
Maps.
Royal military geographic institute.
Relief models.
Voyages.

GEO-PHYSICS.

Meteorology.
  Atmosphere.
    Atmospheric electricity.
  Auroras.
  Climate.
Refraction.
Winds.
Earthquakes.
Geology.
  Phosphates.
  Sand.

ENGINEERING.

Marine engineering.
  Boilers.
    Coal economy.
  Engines.
  Log instruments.
Hydraulic engineering.
  Canals.
    Ship canals.
  Docks.
  Harbors.
  Levees.
  Light-houses.
  Piers.
  Rivers.

GENERAL.

Bibliography.
Expositions.
History.
Biography.
Languages.
Research.
Zoology.

ALPHABETICAL ARRANGEMENT.

IN GENERAL.

UNDER AUTHORS....Entries are arranged in chronological order.
UNDER SUBJECTS....General entries are followed by regional subheadings.
UNDER PLACES.....General entries are followed by subject subheadings.
For full titles see Part I.

ABBREVIATIONS.

app.....Appendix.
Bull.....Bulletin.
p.....Page.
pt.....Part.
Rept.....Report.
Sep. pub.....Separate publication.
Sp. pub.....Special publication.
*.....Exhausted.
†.....Not for general distribution.

*Exhausted.

Africa.

Preston, E. D. 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, 1889–1890. Rept. 1890, app. 12, pp. 625–684.

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Dredging operations by the Coast survey steamer Blake [in the Caribbean sea]. Rept. 1879, app. 6,* pp. 95–102.

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Agonic line.

Schott, C. A. Secular variation in the position of the agonic line of the North Atlantic and of America, between the epochs 1500 and 1900 A. D. Bull. 6. (1888.)

See also Magnetic declination.

Alabama.

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Moser, J. F. Hydrographic notes and sailing directions relating to portions of Alaska from Dixon entrance to Yakutat bay, including reconnaissance surveys of Cordova bay, Bucarelli bay, and Red Fish bay, 1897. Bull. 37. (1899.)

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Rodman, Hugh (compiler). Alaska. General information relating to the vicinity of Chatham and Peril straits, from a recent survey by the U. S. Coast survey steamer Patterson, Lieut. Commander E. K. Moore, U. S. N., commanding, and Cooks inlet and the region to the Westward, by W. H. Dall, U. S. Geological survey. Bull. 35. (1897.)

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See also List of Coast pilots in Part I.

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See also List of Tide tables in Part I.

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Alden, James.

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Alice base, Tex.

Baldwin, A. L. On the measurement of nine base lines along the ninety-eighth meridian. Rept. 1901, app. 3, pp 229–302.

Alidade. *See* Plane table.

Allegheny, Pa.

Peirce, C. S. Determinations of gravity at Allegheny, York and Ebensburg, Pa. Rept. 1883, app. 19, pp. 473–487.

Altitude of polaris. *See* Polaris, Altitude of.

Amelia island, Fla. *See* Fernandina, Fla.

America.

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American arc of the parallel. *See* Transcontinental arc.

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Schott, C. A. Inquiry into the relative value and need of a check of the Peruvian arc of 1736–1743. Rept. 1898, app. 4, pp. 229–232.

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Arctic expeditions. *See* Alaska—Bering expedition—Greely expedition—Greenland expedition—Labrador.

Arctic ocean.

Dall, W. H. Report on the currents and temperatures of Bering sea and adjacent waters. Rept. 1880, app. 16,* pp. 297–340.

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See also Ooglaamie.

Arctic regions.

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See also Alaska—Greenland—Labrador.

Arithmetic.

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Arizona. *See* Date creek camp.

Arkansas.

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See also Mississippi river.

Arkansas City, Ark.—Levels—New Orleans, La.

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Arkansas City, Ark.—Levels—Little Rock, Ark.

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Artificial horizons.
Lane, J. Homer. New form of mercurial horizon. Rept. 1871, app. 16, pp. 189-192

Ascension island. *See* Atlantic islands.

Asia.
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Smith, Edwin. 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. Rept. 1884, app. 14, p. 439–473.
See also Nagasaki—Pacific ocean—Philippine islands—Siberia.

Association geodesique internationale. *See* International geodetic association.

Astoria, Ore.
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Astronomy. *See* Aberration—Azimuth—Eclipses—Instruments—Latitude—Latitude variation—Least squares—Longitude—Mars—Micrometric measures—Mercury—Moon—Personal equation—Plumb line deflection—Pleiades—Polaris—Eclipse—Star catalogues—Sun—Tables—Tides—Time—Transits—Venus.

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Atlantic cable. *See* Longitude (telegraphic).

Atlantic coast of the United States.
COAST PILOT. *See* List of Coast pilots in Part I.
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See also List of Tide tables in Part I.
See also Atlantic ocean—Chesapeake bay—Delaware river—Gulf of Maine—Gulf Stream—Long Island sound—New England.

Atlantic islands.
Preston, E. D. Gravity and the magnetic elements on the west coast of Africa [and on some islands in the North and South Atlantic]. 1889–1890. Rept. 1890, app. 12, pp. 625–684.
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See also Atlantic coast—Aulezavik island—Caribbean sea—Gulf of Maine—Gulf coast—Gulf Stream.

Atlases. *See* Maps.

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See also Atmospheric electricity—Meteorology—Refraction.

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Atmospheric refraction. *See* Refraction.

Attraction (Local). *See* Plumb-line deflection.

Auckland, New Zealand.

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[Leaf can be removed and each of the entries below pasted on separate catalogue cards, the first for series entry, the second for author entry, and the third for subject entry. For the subject entry any desired subject heading must be supplied.]

U. S. Coast and geodetic survey.

Separately issued publications. 1902.

List and catalogue of the publications issued by the U. S. Coast and geodetic survey, 1816–1902. By E. L. Burchard, librarian. [Seal of the Survey.] Washington: Government printing office. 1902.

237 pp. 30cm.
Title preceded by Treasury and Survey heading. O. H. Tittmann, superintendent.

Burchard, Edward Lawver.

List and catalogue of the publications issued by the U. S. Coast and geodetic survey, 1816–1902. By E. L. Burchard, librarian. [Seal of the Survey.] Washington: Government printing office. 1902.

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SLIPS FOR LIST AND CATALOGUE.

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