

**526.9**

S. L. LIBRARY













DIVISION OF MARINE METEOROLOGY,

Dec. 23, 1889.

Respectfully referred to

Prof.

G. Brown Goode.

I have been unable as yet to find the letter of many v.  
It was quoted in "Q.  
Jour. Royal Met.  
Soc." (vol. III or V.  
I don't know which).

In haste,  
Very truly yours  
Ernest Haydon



GC  
29.2

U6H894  
1887 NMAH

174305

526.9

MHT

FOUNDING AND DEVELOPMENT

OF THE

U. S. HYDROGRAPHIC OFFICE,

BY

LIEUT. W. S. HUGHES, U. S. N.

---

PREPARED BY DIRECTION OF

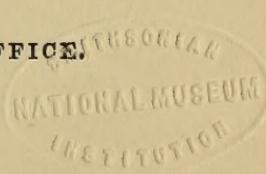
COMMANDER *J. R. Bartlett* U. S. N.,  
HYDROGRAPHER.

---

WASHINGTON:  
GOVERNMENT PRINTING OFFICE.

1887.

11353





## FOUNDING AND DEVELOPMENT OF THE U. S. HYDROGRAPHIC OFFICE.

---

### ESTABLISHMENT OF A DEPOT FOR THE CHARTS AND INSTRUMENTS BELONGING TO THE NAVY.

On the 29th of November, 1829, the Board of Navy Commissioners made to the Secretary of the Navy the following recommendation :

"That an officer be appointed to take charge of all the nautical instruments, books, and charts not on board ship, to keep them in order for use when required. Among other duties he would be required to attend particularly to the time pieces, or chronometers, to ascertain precisely their character, such as their rate of deviation from true time, whether they are affected by changes of weather, &c., for the information of those who may have to use them at sea. The character of each chronometer thus ascertained should be delivered to the officer receiving the chronometer itself." (Navy Commissioner's Letters to the Secretary of the Navy, vol. 3, p. 280, Files of the Navy Department.)

This recommendation was the initial step towards establishing a branch of the Navy Department devoted exclusively to furthering the interests and lessening the dangers of navigation. Prior to this time it had been the custom of the service, when a naval vessel was in need of charts or nautical instruments, for the commanding officer to forward to the Board of Commissioners a requisition for such of these articles as he deemed necessary. The requisition was approved by the Board and sent to the Navy agent at the port where the vessel was fitting out, who fulfilled its conditions by purchases from foreign Governments, or from the few private dealers in this country. No test of instruments was made previous to purchasing them; the simple recommendation of the seller was often the only guarantee of the accuracy of a chronometer or the correctness of a

*Letter of Board  
of Commissioners recommending the establishment of a Depot  
of charts, &c.*

*How vessels were supplied  
with charts and instruments in  
previous years.*

chart. These purchases were afterwards supplemented, during the vessel's cruise, by such additions as were from time to time suggested by the wants of the ship or the judgment of the commanding officer. At the end of a cruise

*Disposition made of charts and instruments at end of a cruise.*  
the charts and instruments were tumbled into store-rooms at the place where the ship happened to be put out of commission, and there remained with little care or attention until the fitting out of another vessel found them in many instances unfit for use. (Report No. 449, H. R., 27th Cong., 2d sess.)

The recommendation of the Board of Commissioners, before quoted, failed at first to receive from the Department the consideration that it merited ; but it called forth in November of the following year a communication upon the same subject from Lieut. L. M. Goldsborough, addressed to Hon. John Branch, Secretary of the Navy, from which the following extract is taken :

*Letter of Lieut. L. M. Goldsborough to the Secretary, advocating the founding of a Depot of charts, &c.*  
“The Navy Commissioners, with the same degree of vigilance with which they have ever regarded the interests of the service, are not insensible to the necessity of adopting a systematic and efficient course in relation to our nautical instruments.

This Board, to whom the Navy is so largely indebted for so many happy and important improvements, have expressed in their report of last year a general opinion on this subject, from which conclusions may be inferred not at issue with what is here, with great deference, suggested :

“First. That a suitable place be designated to serve as a general depot for all the chronometers, instruments of reflection, theodolites, circles, telescopes, charts, &c., belonging to the Navy. At present, such instruments as are not on ship-board are dispersed about among the naval stores of our yards, in charge of individuals perfectly unacquainted with such matters, and corroding and becoming ruined for want of proper attention.

*An officer to be in immediate charge of the Depot.*  
“Second. That to this depot there be attached a competent officer, and an artist of known merit and capacity—the former to act under the immediate orders of the Navy Commissioners, to be made personally responsible for all instruments submitted to his charge, and especially required to determine the rates and characters of chronometers, to make it his duty to inform himself of all improvements and discoveries in connection with navigation, and to furnish upon

requisitions, approved by the Navy Board, all ships fitting out with their necessary nautical apparatus; the latter to repair, clean, adjust, assist in rating, &c., to the end that all the instruments may be kept in proper order, and at all times ready for use. He should be required also to examine and test thoroughly all chronometers previous to their being purchased.

Instruments to  
be repaired,  
cleaned, &c., at  
the Depot.

"The only instrument, in addition to those already belonging to the Navy, necessary to such a depot, would be one of reflection and great radius, with tripod, vertical and oblique plane screws. Its cost would be, perhaps, \$200.

"With what has already been said of the neglect and prejudicial consequences attending the present mode of regarding our nautical instruments, if it be considered that many thousands of dollars have been expended in their collection, assuredly it cannot be questioned that economy as well as the efficiency of the service would be promoted by a proper modification extending to our navigating department." (Officers' Letters to Secretary of the Navy, vol. ix, p. 53, Files of the Navy Department.)

As an instance of the want of care and attention given to the proper keeping and rating of chronometers, and of the Want of care  
in rating chro-  
nometers.  
serious consequences liable to attend such a system, Lieutenant Goldsborough further says:

"In 1821 the Franklin, 74, sailed from New York for the Pacific Ocean with one of these instruments (chronometers) on board as the principal guide in determining her longitude. Twenty-five or thirty days thereafter one of the Cape Verde Islands was suddenly and unexpectedly descried, the chronometer not placing us within sixty miles of our actual position. The first impression was that the instrument was radically defective, and, by its differing so far from the truth, no further confidence could be placed in its correctness. Thus were we deprived of the mainstay of our navigation. Upon our arrival in Rio Janeiro, Commodore Stewart thought proper to have ascertained by observations whether its correct rate had been given us on leaving New York. So far from such proving the case, instead of *three* seconds and a fraction (the daily rate given us on our departure), it was found to be *eleven* seconds and a fraction. Had the precautionary measure of making one of the Cape Verde Islands not been taken, this glaring error of eight seconds a day would have caused, in our passage of

Glaring error  
in chronometer-  
rate discovered  
after sailing.

forty-five or fifty days, a discrepancy between the calculated and actual position of our ship of not less than 85 or 100 miles, a distance sufficient to jeopardize the safety of half a million of public property and the lives of seven hundred and fifty men. Had we been directed to continue our course around Cape Horn without stopping at Rio or elsewhere, or had we been directed, in time of war, to cruise at sea the same number of days employed on our passage (which amounted to one hundred and two, deducting our detention at Rio), this chronometer, though subsequently proving itself of great value and correctness, being thus improperly rated, would have led us into an error exceeding the distance of 200 miles." (Officers' Letters to Secretary of the Navy, vol. ix, p. 53, Files of the Navy Department.)

The views and suggestions of Lieutenant Goldsborough met with the approbation of the Secretary of the Navy, and were by him forwarded to the Board of Navy Commissioners for further consideration. The Board of Commissioners, of which Commodore John Rodgers was then president, urged the prompt establishment of such a depot, and recommended that it be located at the seat of Government.

*Lieutenant Goldsborough ordered to collect instruments, &c., and bring them to Washington.* Accordingly, on the 6th of December, 1830, Lieutenant Goldsborough was directed to proceed to Philadelphia, New York, Portsmouth, N. H., and Norfolk, Va., to receive from the commandants of the navy-yards at those places chronometers, sextants, theodolites, circles, and other nautical instruments not in use, and transport them to Washington. (Navy Commissioners' Letters to Officers, vol. i, p. 500, Files of the Navy Department.)

In obedience to this order Lieutenant Goldsborough collected the instruments belonging to the Navy, brought them to Washington, and deposited them in a building, rented for that purpose, situated on what is now G street northwest, between Seventeenth and Eighteenth streets. (Memoir of the Founding of the U. S. Naval Observatory, Prof. J. E. Nourse, U. S. N., p. 14.)

*Lieutenant Goldsborough ordered to take charge of the Depot.* Lieutenant Goldsborough was naturally the first officer ordered to take charge of the depot thus established. The commandants of the several navy-yards were directed to forward all the charts and nautical books stored at their respective yards, which, on their arrival at the depot, were systematically arranged, marked, boxed, and placed in a

condition for issue. The same care was given to the instruments, and, in order to designate them as public property, the Board of Commissioners ordered that the words "U. S. Navy" be engraved upon all instruments belonging to the naval service. (Navy Commissioners' Letters to Officers, vol. i, p. 516, Files of the Navy Department.)

On July 13, 1831, Passed Midshipman R. B. Hitchcock was ordered to report to Lieutenant Goldsborough as his assistant.

In addition to the care and issue of the charts and instruments furnished to United States vessels, on fitting out for sea, it was the duty of the officers connected with the depot to ascertain the errors and rates of all chronometers belonging to the Government. This was at first accomplished by means of sextant and circle observations, but a 30-inch transit instrument was afterwards obtained for that purpose, through the efforts of Lieutenant Goldsborough, and mounted in a small circular building near the depot. (Memoir of the Founding of the U. S. Naval Observatory, Prof. J. E. Nourse, U. S. N., p. 14.)

Early in 1831 the duties assigned to the officers in charge of the Depot were increased so as to include "the purchase of all charts and chronometers, as well as the sale of such of the latter, or of any nautical instruments, as prove not adapted to the wants of the Navy." (Navy Commissioners' Letters to the Secretary, vol. iv, p. 128, Files of the Navy Department.)

Chronometers, previous to their purchase, were required to be placed on trial at the depot, to be kept there until the time fixed for testing them had expired, and only those were accepted that stood the required tests.

Great difficulty was experienced in obtaining and maintaining at the depot an adequate supply of the latest charts, and Lieutenant Goldsborough early turned his attention towards devising some means of supplying this want. Through his efforts the subject was laid before the Hon. L. Woodbury, Secretary of the Navy, in a letter from the Board of Commissioners, from which the following is quoted:

"In procuring our charts and nautical works, we have to rely upon the supplies to be found in the stores where such articles are vended, and must often of necessity procure those which are not the most approved. Almost every

Duties of officers attached to the Depot.

Duties of officers attached to the Depot increased.

Chronometers placed on trial at the Depot prior to purchasing them.

System of obtaining charts and nautical books.

chart in use is of European origin, and many of the most valuable are calculated from meridians to which our service is not accustomed, and they are accompanied by sailing directions, in foreign tongues not generally known in

Proposal to reduce to the meridian of Greenwich the foreign charts issued by the Depot.

Lieutenant Goldsborough has proposed to make such modifications of the charts as would be necessary to reduce them to the meridian of Greenwich (whence we estimate our longitude), and to translate the instructions into English, so as to adapt them to our service, and the Commissioners have accordingly directed him to proceed with the work. When finished the question will arise, How shall these charts and directions be multiplied so as to furnish the service generally with them? Engraving the charts would be expensive. A lithographic press would be the cheapest mode, and would ultimately prove a measure of economy, as we should be enabled by it to provide all the charts and multiply to any extent all the plans, drawings, views, or manuscripts required for the service.

We might thus at the earliest moment avail ourselves of

Purchase of a lithographic press recommended.

the scientific labors of other nations, and greatly improve our own navigation at an expense quite inconsiderable, and, in all probability, less than we now pay for ordinary charts. It is understood that a press of this kind, with its necessary appurtenances, might be procured for about \$600, and that one laborer will be sufficient to work it. Such a press offers so many facilities and would be attended with such advantages that the Commissioners will, with your concurrence, take the necessary measures to procure one."

(Navy Commissioners' Letters to the Secretary, vol. iv, p. 174, Files of the Navy Department.)

Notwithstanding this earnest appeal of the Commissioners, the necessary permission to purchase a lithographic press for the reproduction of charts was not destined to be obtained until long after Lieutenant Goldsborough had severed his connection with the depot.

Lieutenant Goldsborough remained in charge of the Depot until the 11th of February, 1833, on which date he was detached, and Passed Midshipman Hitchcock was ordered to assume temporary control until the appointment of a new superintendent.

Lieut. Charles Wilkes ordered as Lieutenant Goldsborough's relief.

In reply to a request of the Secretary of the Navy, dated the 18th of the same month, calling for the names of officers then in the United States, who were regarded as most

capable of filling the position left vacant by the detachment of Lieutenant Goldsborough, the Board of Commissioners recommended Lieuts. Charles Wilkes, H. A. Adams, and T. R. Gedney. Of these Lieut. Charles Wilkes was chosen, and assumed charge on the 12th of March, 1833. (Navy Commissioners' Letters to Officers, vol. 1, p. 587, Files of the Navy Department.)

Lieutenant Wilkes, with the consent of the Board of Commissioners, removed the Depot, early in 1834, to what <sup>Removal of the Depot to Capitol Hill.</sup> was known as the "Wilkes House," on Capitol Hill, and erected near by, at his own expense, a small observatory, "situated about 1,000 feet north of the dome of the Capitol," in which was mounted a 5-foot transit instrument. (Memoir of the Founding of the U. S. Naval Observatory, Prof. J. E. Nourse, U. S. N., p. 14.)

Although the Depot was thus given somewhat the character of an observatory, no regular series of astronomical observations were made during Lieutenant Wilkes's superintendency, the transit instrument being employed mainly in rating chronometers. The work performed at the depot was almost solely that pertaining to the care and purchase of charts and instruments, and their issue to vessels on going to sea.

In May, 1835, the recommendation of the Board of Commissioners that a lithographic press be purchased for use in <sup>Purchase of a lithographic press for the Depot.</sup> the depot, first made at the suggestion of Lieutenant Goldsborough some four years previous, was carried into effect. (Navy Commissioners' Letters to Officers, vol. 11, p. 70, Files of the Navy Department.)

The introduction of this press was the initial step towards chart-production at the Depot, and in the following autumn <sup>First lithographed charts issued.</sup> the first lithographed charts made their appearance.

In the summer of 1836, Lieutenant Wilkes was sent to Europe, under authority of the Navy Department, to purchase instruments for the exploring expedition which the Government had decided to send out, and Lieutenant Hitchcock was placed in charge of the depot during his absence.

On the 10th of November of that year, Lieut. James M. Gilliss was ordered to the depot as assistant; and in the spring of 1837, on the detachment of Lieutenant Wilkes, he became its superintendent. (Memoir of the Founding of the U. S. Naval Observatory, Prof. J. E. Nourse, U. S. N., p. 14.)

<sup>Lieut. J. M. Gilliss ordered as Lieut. Wilkes's relief.</sup>

First engraved  
charts issued.

During 1837 four engraved charts were published by the Depot from surveys made by the officers of the U. S. brig Porpoise and schooners Maria and Badassah. Between this period and the close of 1842 eighty-seven engraved charts were issued, nearly all of surveys made by the U. S. Exploring Expedition under Lieut. Charles Wilkes. The work of engraving the plates for these charts, as, in fact, for all engraved charts published by the Depot during its existence of upwards of thirty-five years, was done under contract by persons unconnected with the Depot itself.

Astronomical  
instruments ob-  
tained for the De-  
pot.

Lieutenant Gilliss was essentially an astronomer. He succeeded in obtaining a portable 42-inch astronomical telescope, a variation transit instrument, an 8-inch dip-circle, a sidereal chronometer, and other astronomical instruments, and commenced a series of observations on the culminations of the moon and stars. But the unsuitable character of the depot for such observations, the lack of space and of proper instruments, soon became apparent.

Efforts to estab-  
lish an astrono-  
mical observatory  
unsuccessful.

For a number of years the Board of Commissioners, together with Lieutenants Goldsborough, Gilliss, Wilkes, and others, all deeply interested in the advancement of astronomical science, and more especially in those branches of it pertaining to navigation, had been zealous advocates of the founding of an astronomical observatory. In the House of Representatives, Hon. John Quincy Adams, among others, had long sought to establish such an institution. At every opportunity he made strenuous efforts to secure the favorable action of Congress upon the subject, but "so bitter was the rancor of political partisanship at this time," says his biographer, "and so intense the hatred entertained by the then dominant section of the country against Mr. Adams, that opposition to the design became identified with party spirit, and to defeat it no language of contempt or ridicule was omitted." (Memoir of John Quincy Adams.) To such an extreme was carried the opposition to Mr. Adams' cherished project that in every appropriation made by Congress, during several years, after carefully specifying the purposes to which it was to be applied, the restricting words "*and to no other,*" were scrupulously added.

Steps leading  
to the establish-  
ment of a perma-  
nent Depot for  
charts and in-  
struments.

Failing to obtain the required legislation and appropriation, the advocates of the measure turned their united energies towards a partial accomplishment of the same end by

endeavoring to secure a "permanent depot for charts and instruments." In this effort they were more successful.

In a communication to the Secretary of the Navy, submitting estimates for the support of the Navy for the following year, the Board of Commissioners, in November, 1841, strongly urged the establishment of an enlarged and permanent depot. "The Board," says their report, "are fully convinced of the advantage of such an establishment, properly constructed and judiciously located, and earnestly recommend it to your favorable consideration. The probable cost of a suitable site and buildings would not exceed \$50,000. If half this sum were appropriated, it could be commenced the ensuing season with advantage, and be completed in 1843."

The Secretary of the Navy, Hon. Abel P. Upshur, warmly indorsed the recommendation of the Board, and embodying it in his annual report to President Harrison, it was brought before Congress in December, 1841. A bill was at once introduced to establish a permanent depot, in accordance with the recommendations of the Secretary of the Navy, and of the Board of Commissioners, but it met with much delay. The bill was accompanied by a report representing the absolute necessity of such an establishment to the welfare of the Navy, and the utter inadequacy of the depot then in existence.

"We are indebted to other nations," says the report, "for the means which enable our ships to cross the ocean. The present depot is entirely unsuited to the wants of the Navy or the protection of the instruments. A small observatory is absolutely essential to the depot; but, from defects in the original construction of the building, a considerable portion of the heavens is entirely obscured; nor can these defects be remedied, even were the building worthy of alteration." (Report No. 449, H. R., 27th Cong., 2d sess.)

Fortunately the bill was placed in the hands of Hon. Francis Mallory, of the House Naval Committee, whose warm advocacy of the measure and persistent exertions in its favor were finally rewarded by success. At the last hour of the second session of the Twenty-seventh Congress an act was passed authorizing the Secretary of the Navy "to contract for the building of a suitable house for a depot of charts and instruments of the Navy, on a plan not ex-

Board of Commissioners recommend the establishment of a Depot.

Recommendation of the Board endorsed by the Secretary of the Navy.

Law passed authorizing the permanent Depot.

ceeding in cost \$25,000, to be located on any portion of unappropriated public land in the District of Columbia which the President might deem suitable."

Lieutenant Gilliss ordered to prepare plans of the new Depot. The duty of preparing a plan for the new depot was intrusted to Lieutenant Gilliss. He was directed to visit the principal Northern cities of the United States for the purpose of obtaining information on the subject, and to submit to the Navy Department a design, "which, while it combined essentials, should not exceed in cost the sum appropriated."

The controlling idea of Lieutenant Gilliss was to erect an observatory rather than a simple depot for charts and instruments. "In the mere store-rooms for charts and instruments," he says, "I feel no anxiety. The house on Capitol Hill would have answered just as well as any other, and a 3½-foot transit, in a box 10 feet square, would have served to obtain the time for the comparing clock. These, therefore, possessed no attractions for me, and I should have regarded it as time misspent to have labored so earnestly only to establish a *depot*. My aim was higher. It was to found an institution for the practical pursuit of the highest known branch of science." (Senate Doc. No. 114, 28th Cong., 2d sess., p. 66.)

But the wording of the act authorized the building of a *Depot* only, and, lest the meaning of the law should be perverted, Lieutenant Gilliss prepared drawings and specifications of a building wherein the apartments allotted to the charts and instruments were of ample dimensions, while those intended for astronomical observations were unsuit-

Plans for a Depot submitted to the Secretary of the Navy. ably small. These plans were submitted to the Navy Department in November, 1842, but the Secretary of the Navy, before deciding upon their final acceptance, instructed Lieutenant Gilliss to visit Europe and submit the drawings to some of the most distinguished European astronomers for such suggestions as their experience dictated.

Lieutenant Gilliss returned to the United States in March, 1843; and, on the 23d of the following November, he submitted new drawings and designs for a building embracing many improvements over the original plans, and "adapted

New plans submitted for the Depot. in form and structure not only for a depot of charts and instruments, but also for an astronomical observatory." (Annual Report of the Secretary of the Navy, 1843.)

The new plans were approved, and the work of building the depot was at once commenced. The site chosen by President Tyler was a knoll on the Government reservation marked "No. 4" in the original plan of Washington, and the edifice that was then begun is that now known as the United States Naval Observatory.

Upon the same date on which Congress authorized the erection of a permanent depot for the charts and instruments (August 31, 1842), an act was passed making radical changes in the organization of the Navy Department. (U. S. Stat. L., vol. v, p. 579.)

This act dissolved the Board of Navy Commissioners, which had virtually ruled the navy for upwards of twenty-seven years, and created in their stead a number of bureaus in the Navy Department, each being under the immediate charge of an officer who was designated as its chief.

The Secretary of the Navy, in an order dated the 26th of the following November, defining the duties and responsibilities of the several bureaus, directed that the depot of charts and instruments should be attached to the Bureau of Ordnance and Hydrography, and should constitute the hydrographic branch of that bureau. (Records Bureau of Ordnance, 1842, vol. 1, p. 14.)

While Lieutenant Gilliss was engaged in the preparation of plans for the permanent depot authorized by Congress, and afterwards in superintending its construction, Lieutenant M. F. Maury had been placed in charge of the old Depot; and, with the consent of the Department, had removed it to a building situated on Pennsylvania avenue, between Twenty-fourth and Twenty-fifth streets northwest.

On the completion of the new "Depot and Observatory," as it was then called, in September, 1844, Lieutenant Maury became its Superintendent, and at once transferred to it the nautical books, charts, and instruments belonging to the Navy Department.

While his predecessor had been inclined to favor the astronomical part of the depot, Lieutenant Maury's energies were devoted almost entirely to hydrographic subjects. He took immediate steps in the interest of that branch of science, by beginning the collection of information from the logs of men-of-war and merchant vessels, "according to a carefully devised scheme for the purpose of making charts to show the prevailing winds and currents, their limits and

Plans for a Depot and Observatory adopted and the work of construction commenced.

Establishment of the Bureau of Ordnance and Hydrography, among other bureaus, and dissolving the Board of Commissioners.

The Depot attached to the newly-made Bureau of Ordnance and Hydrography.

Removal of the depot to Pennsylvania avenue, between Twenty-fourth and Twenty-fifth streets northwest.

Lieut. M. F. Maury ordered to take charge of the Depot.

Collection of information for the Wind and current Charts.

<sup>Information given by the Wind and Current Charts.</sup> general characteristics, and, in general, all the physical features of the ocean, including its meteorology, the limits

of icebergs, the feeding ground of whales, and all facts of interest or value to the maritime community." (Senate Report No. 1285, 49th Cong., 1st sess., pp. 26 and 27.)

These proposed charts were termed "Wind and Current Charts," under which general name were included Track Charts, Trade-Wind Charts, Pilot Charts, Whale Charts, Thermal Charts, and Storm and Rain Charts.

To collect the information necessary for such charts required the constant labor of a large part of the force of the Depot. Merchantmen were slow at first to accede to the request of the Superintendent to forward their logs for inspection, but gradually they began to comprehend the efforts being made in their behalf, and readily furnished all the information in their power.

<sup>First issue of charts of the Wind and Current series.</sup> The close of 1847 found three of the "Track Charts" ready for publication, and early in the following year they were issued to the maritime world. Copies of these charts were distributed gratuitously to the captains of merchant vessels who had contributed their logs. The charts were of the

North Atlantic Ocean, and showed the tracks of a great number of vessels, the month in which each passage was made, the character of the weather, and the prevailing winds and currents encountered by each vessel.

In 1849 the series was completed, consisting of eight charts covering the whole of the North Atlantic and a portion of the South Atlantic Ocean.

<sup>Collection of information for Whale Charts.</sup> The next to be issued, of the general series of Wind and Current Charts, were the "Whale Charts." These were designed "to show at a glance where this animal has been most hunted; where, in what years, and in what months, it has been most frequently found; whether in shoals or as stragglers, and whether sperm or right." The charts divided the parts of the oceans frequented by whales into districts, of 5 degrees of latitude by 5 degrees of longitude in size, and showed the number of days in each month of the year that whalers had spent in each district, as well as the number and species of whales that had been seen. (Maury's Sailing Directions, 7th ed., 1855, p. 252.)

<sup>First issue of the Whale Charts.</sup> Early in 1851 the Whale Charts were ready for issue, and were soon after sent out to whalers, while at the same time a notice was published in the newspapers of the day announcing their object.

Since the passage of the act of 1842 the Depot of Charts and Instruments had been frequently designated officially as a "Naval Observatory and Hydrographic Office," though its lawful title remained unchanged. Though still in name simply the Depot of Charts and Instruments, astronomical work was by no means neglected. The first volume of observations was published in 1846, under the authority of the Hon. George Bancroft, Secretary of the Navy; and in 1851 the second volume of the same series made its appearance.

First volume of  
Astronomical Ob-  
servations is-  
sued.

During the seventeen years of Lieutenant Maury's superintendency, from 1844 to 1861, a great part of the force under his employ was engaged, as has been said, in the preparation and publication of the Wind and Current Charts, and in the compilation of Sailing Directions. The charts were issued, from time to time, as they were successively completed, and their scope was gradually extended to include every sea frequented by our ships. Eight volumes of Sailing Directions, containing information upon a vast number of subjects connected with navigating the ocean, were published and issued to vessels of the Navy and merchant marine.

Some idea of the work accomplished can be formed when it is known that two hundred thousand copies of the Wind and Current Charts, and twenty thousand copies of Sailing Directions were issued gratuitously to merchant vessels alone whose masters had furnished information to the Depot. The immediate charge of that part of the Depot devoted to nautical instruments and navigating charts was given to an officer, with several assistants, whose duties consisted in taking meteorological and magnetic observations, observing the errors and rates of chronometers, and in examining, purchasing, and issuing charts, instruments, and nautical books to vessels of the navy. During the period from 1844 to 1861 there were engraved and published by the Depot forty-four general sailing charts, all from the surveys of the North Pacific Surveying Expedition under Commander John Rodgers; also a number of plans of anchorages and passages in the Fiji groups, from surveys of the Exploring Expedition under Commodore M. C. Perry.

Number of the  
Wind and Cur-  
rent Charts and  
of Sailing Direc-  
tions distributed  
among merchant-  
men.

On the breaking out of the civil war, Maury, then a commander, suddenly deserted the post which he had filled so long, and with such exceptional ability, and hastily fled

Maury's deser-  
tion from his post  
and the service.

<sup>Maury's flight from Washington.</sup> from Washington under the erroneous impression that his treachery had been discovered. "Only two hours previous to his flight," says Dr. Gould, "he had waited upon the Secretary of the Navy at his office, and gave no intimation of any design to resign, or of any disloyal sentiment. It was subsequently found that the preparations for his departure had been for some time going on, but at the last his haste was so great that sundry documents were left behind which completely disclosed the fact that he had been engaged in treasonable correspondence with the enemy." ("The U. S. Naval Observatory at Washington," Dr. Gould, National Almanac, 1864).

<sup>Maury's dismissal from the Navy by direction of the President. Commander Gilliss becomes Superintendent.</sup> Maury was promptly dismissed the navy by order of the President, and Commander James M. Gilliss, the original builder of the Depot, became its Superintendent.

The exigencies of war greatly increased the labors of the Depot, which consisted in the purchase, care, and distribution of compasses, charts, spy-glasses, chronometers, and other navigating instruments used by the navy, while the number of officers who could be spared for such work was necessarily reduced by the same cause.

During a period of four years there were kept supplied with navigating instruments, charts, logs, &c., nearly six hundred active cruising vessels, engaged in actual war,—a number more than ten times that of the whole navy in previous years.

Commander Gilliss early adopted the policy of encouraging American instrument-makers, by giving preference to their instruments, when equally as well made as those of foreign manufacture, and the result soon proved the wisdom of his course. By the end of 1861, American sextants, spy-glasses, and other nautical instruments were produced superior in quality and at a lower price than those obtained from the most celebrated factories of Europe.

<sup>Transfer of the Depot and Observatory from the Bureau of Ordnance to the Bureau of Navigation.</sup> Under the act of July 5, 1862, reorganizing the Navy Department, the Depot and Observatory was transferred from the Bureau of Ordnance to that of Navigation, while zealously laboring to keep supplied with every needed chart and instrument an active navy, suddenly and vastly increased to meet the necessities of war, the Superintendent determined that the Depot should not fail to fulfill also its character as an observatory. Astronomical and meteorological observations were regularly and systematically

made, and their prompt publication was prevented only by the pressure brought upon the Government Printing Office by more urgent work.

During the period between 1862 and 1865 there were published charts of the compass-stations at New York,<sup>Charts of compass-stations published.</sup> Boston, Hampton Roads, the Delaware River, and Portsmouth, N. H.

The death of Captain Gilliss occurred on the 9th of February, 1865, and, on the 28th of April Rear-Admiral C. H. Davis was appointed his successor.

Aside from its regular duties, the most important work of the Depot during the following year was the preparation of a report in accordance with a Senate resolution calling upon the Secretary of the Navy to furnish "the summit levels and distances by survey of the various proposed lines for inter-oceanic canals and railroads between the Atlantic and Pacific Oceans, as also their relative merits" as practicable lines for the construction of a ship-canal, and especially as relates to the Honduras, Tehuantepec, Nicaragua, Panama, and Atrato lines.<sup>Report on interoceanic canals and railroads prepared in the Depot.</sup>

No new surveys were made for this report, but the information required was collected from various sources, and an elaborate report submitted, accompanied by fourteen maps and profiles.

#### FISCAL YEAR ENDING JUNE 30, 1867.

On the 21st of June, 1866, the connection between the Observatory and the Depot of Charts and Instruments was severed by law. The act of Congress, passed on that date, established "A Hydrographic Office for the improvement of the means for navigating safely the vessels of the Navy and mercantile marine, by providing, under authority of the Secretary of the Navy, accurate and cheap nautical charts, sailing directions, navigators, and manuals of instruction for the use of all vessels of the United States, and for the benefit and use of navigators generally." (U. S. Stat. L., vol. xiv, p. 69, and Rev. Stat., secs. 431, 432, 433.)<sup>Hydrographic Office established by name.</sup>

The act further provided that the Secretary of the Navy be authorized "to cause to be prepared," in the Hydrographic Office thus created, such "maps, charts, and sailing directions, and nautical books relating to and required in navigation, and to publish and furnish them to naviga-

tors at the cost of printing and paper, and to purchase the plates and copy-rights of such existing charts, maps, sailing directions, &c., as he may consider necessary."

*Transfer of the Hydrographic Office to the corner of Eighteenth street and New York avenue N.W.*

*Commander Fillebrown ordered to take charge of Hydrographic Office.*

A building, generally known as the "Old Octagon House," situated at the northeast corner of New York avenue and Eighteenth street, in the northwest section of Washington, was rented by the Government, and the charts, books, and instruments, with the exception of the chronometers, were removed to it. Commander Thomas Scott Fillebrown was the first officer ordered to take charge of the new Hydrographic Office, and assumed his duties on the 1st of August, 1866. There were associated with him as assistants two lieutenant-commanders, one lieutenant, two ensigns, one professor of mathematics, and seven civilian employés, including one writer, one instrument-maker, one assistant instrument-maker, and one draughtsman.

Steps were at once taken to carry out the provision of law authorizing the purchase of plates, &c., for the printing of charts. Only one firm in the United States had undertaken, on anything like an adequate scale, the publication of charts and hydrographic information for the benefit of vessels engaged in ocean commerce. This firm, Messrs. E. & G. W. Blunt, of New York City, proposed to sell to the Government such charts, maps, nautical books, and chart-plates as were in its possession. A board of experts was appointed by the Navy Department to determine the value of the articles offered for sale.

*Purchase of plates from the Messrs. Blunt, of New York.*

This board, consisting of Messrs. C. P. Patterson, W. Chauvenet, and D. Van Nostrand, recommended the purchase of the articles, and they were accordingly bought for the use of the Hydrographic Office.

The estimated values of the articles were as follows:

Stereotype plates of books .....	\$5,200
Chart plates .....	22,174
Drawings of charts .....	10,285
Copyright of books .....	25,309
 Total .....	 \$62,968

The amount ultimately agreed upon, however, was slightly in excess of this sum, being \$63,309.

The few copper and steel engraved plates that had come into the possession of the Navy Department during the preceding years had been generally left in the hands of

the engravers and lithographers who had contracted to execute the particular work authorized from time to time by Congress. They comprised the engraved plates of the surveys made by the Wilkes Exploring Expedition in 1838-'42, and the North Pacific and Arctic Surveying Expedition, under Commander John Rodgers, in 1853-'56, as well as some plates of surveys made by the expedition to Japan, under Commodore M. C. Perry, in 1852-'55. These plates, together with those obtained by the recent purchase, were now collected and placed in the Office. Besides the classification and systematic arrangement of the charts, plates, nautical publications, &c., ten charts were published by the Office in this year, principally from surveys of the North Pacific Surveying Expedition. Also a volume was issued on the general examination of the Pacific Ocean.

Engraved plates belonging to the Department prior to the purchase from the Messrs. Blunt.

#### FISCAL YEAR ENDING JUNE 30, 1868.

Early in the year the labor of correcting the chart-plates was begun, those obtained from the Messrs. Blunt, owing to changes and more reliable information, having been found full of errors.

Correcting of chart-plates begun.

A workshop for the repair of nautical instruments was established in the Office, and a number of the more delicate navigating instruments that were found, on being turned in from ship's use, to require refitting and readjusting were successfully repaired. During the year a pamphlet on Dangers and Ice in the North Atlantic was issued by the Office. Seventeen charts were published, two of islands in the North Pacific, from surveys made by the officers of the Lackawanna, Capt. William Reynolds; one of Spex Strait, from surveys made by officers of the Monocacy, Commander S. P. Carter; and several from surveys of the North Pacific Surveying Expedition.

#### FISCAL YEAR ENDING JUNE 30, 1869.

On the 28th of July, 1868, Capt. N. B. Harrison relieved Commander Fillebrown in charge of the Hydrographic Office. Changes were made from time to time in the officers on duty in the Office, but their number remained substantially the same. An increase was made in the civil

Capt. N. B. Harrison ordered to take charge of the Office.

establishment of the Office, in 1868, by the addition of one printer and two engravers.

Commander E.  
Simpson ordered  
to take charge of  
the Office.

December 31, 1868, Commander Edward Simpson assumed charge of the Office, relieving Captain Harrison. British Admiralty charts had been purchased from time to time during the preceding years, and their increasing number now necessitated the setting apart of a separate room for their stowage. This was accordingly done in 1869, and the British charts on hand were catalogued and arranged on shelves in the "Admiralty Chart-Room."

Establishment  
of Admiralty  
Chart-Room.

First Hydro-  
graphic Notices  
and Notices to  
Mariners.

The first "Hydrographic Notices" and "Notices to Mariners" were published and sent out from the Office in this year. Many of the former originated in the Office, from information reported directly to the Navy Department, the others being copies of similar publications issued by foreign Governments. The publications during the year were, "Sailing Directions for the Coasts of Alaska and Behring's Sea;" "Ships' Compasses, including the subjects of Bin-nacles and Swinging Ship," by Commodore Thornton A. Jenkins; and a pamphlet on "The Barometer, Thermometer, and Hygrometer, and Atmospheric Appearances at Sea and on Land as Aids in Foretelling Weather;" also twenty-nine charts, some of which were from surveys made by the officers of the Wachusett, Commander R. W. Shufeldt; the Shenandoah, Commander J. C. Febiger; and the Narragansett, Commander R. W. Meade. The remaining charts were mainly reproductions from the corrected plates purchased from the Messrs. Blunt.

#### FISCAL YEAR ENDING JUNE 30, 1870.

Agents ap-  
pointed for sale  
of Hydrographic  
publications. In August, 1869, agents for the sale of the publications of the Hydrographic Office were appointed in New York, Boston, New Orleans, and San Francisco.

During the year the Office published volumes on the "General Examination" of the Atlantic Ocean, the Mediterranean Sea, and the Indian Ocean, all translated from the French of Capts. A. Le Gras and P. De Kerhallet, by Capt. R. H. Wyman; a work on "Winds, Currents, and Navigation of the Gulf of Cadiz, the Western Coast of the Spanish Peninsula, and the Strait of Gibraltar," by Captain Wyman; also pamphlets on "Rules of the Road at Sea," "The Ther-

mometer, Barometer, and Hygrometer as Weather Guides," and "Form Books," for surveyors.

Twenty-two charts were issued, of which seven were republications of corrected Blunt charts, one a re-publication of the corrected North Pacific Surveying Expedition chart, and fourteen republications of foreign charts by the lithographic process.

On the 5th of October, 1869, Commodore George F. Emmons took charge of the Office. During his incumbency, in the following year, the cheaper process of reproducing charts by "autographing" was first employed. At this time there still remained in the possession of Messrs. Blunt a number of chart-plates not included in the original purchase. In December these additional plates were obtained by the Office at a cost of \$11,149.20. Commodore Emmons remained at the head of the Office until the 1st of October, 1870, when he was relieved by Capt. R. H. Wyman.

Commodore  
Emmons ordered  
in to take charge of  
Hydrographic  
Office.

#### FISCAL YEAR ENDING JUNE 30, 1871.

Early in Captain Wyman's administration Commodore James Alden, the Chief of the Bureau of Navigation, issued the following order reorganizing the Hydrographic Office and dividing it into departments, which was approved by the Secretary of the Navy on the 21st of January, 1871:

"The officer in charge of the Hydrographic Office will be the Hydrographer to the Bureau of Navigation, and be responsible for everything emanating from that Office. From intercourse with foreign hydrographic offices, information received from our naval vessels and mercantile marine, together with the perusal of hydrographic publications, &c., he is expected to be acquainted with what has already been done and is doing in this branch, and to point out what may, from time to time, be desirable to accomplish."

"Under the hydrographer there will be five departments, as follows:

- No. 1. Archives, &c.
- No. 2. Chart department.
- No. 3. Meteorological department.
- No. 4. Drafting and Engraving.
- No. 5. Instruments.

Names of the  
several depart-  
ments.

The heads of departments to be naval officers, with exceptions. The officer in charge of department No. 1 will be the assistant hydrographer; those in charge of the other departments will be styled the heads of these departments.

The hydrographer, the heads, and those attached to the different departments will be officers of the Navy, with the exception of department No. 4 (drafting, &c.), the head of which must be an expert hydrographic draftsman.

The head of department No. 5 (instruments) will be (if practicable) a naval professor.

The requirements of the departments are as follows:

#### No. 1. DEPARTMENT OF ARCHIVES.

General duties in the Department of Archives. To collect and record for reference all hydrographic information; to review, classify, and arrange all authorities of reference, not only of books, &c., but of charts.

The preparation of Sailing Directions, of Hydrographic Notices, and of an Hydrographic Magazine comes under this department, as also their correction, and the correction and publication of foreign light-house books.

This department will also take charge of and issue all sailing directions and hydrographic information published by order of the Bureau of Navigation.

#### No. 2. CHART DEPARTMENT.

General duties in the Chart Department. Includes all charts, Hydrographic Office, English, &c.; to keep them corrected to date; to keep informed regarding all recent publications of charts, and to issue charts to United States vessels, dealers, &c., and keep an account of the same.

The printing and keeping up of the charts (already on the shelves) will come under this department.

#### No. 3. METEOROLOGICAL DEPARTMENT.

General duties in the Meteorological Department. To construct wind and current charts according to the forms which have been adopted, and for this purpose to collect and systematically arrange the meteorological data now on hand, or which may be received.

To take charge of all log-books, track-charts, remark-books, and such other books, charts, and papers as may be required in the construction of the wind and current charts.

To prepare and issue a blank meteorological journal, constructed according to the most recent requirements, for the purpose of collecting meteorological data suitable for use in making both special and general inquiries into the science.

To keep informed on all subjects that pertain to meteorology and physical hydrography.

To keep account of all issues, expenditures, &c., in this department.

#### No. 4. DRAFTING AND ENGRAVING.

The construction of charts, the engraving and correcting of plates, the plotting of surveys and astronomical computations will belong to this department.

The head of this department is responsible to the hydrographer for the entire correctness of all charts emanating from this department, both in astronomical positions, topography, and coast lines, in accordance with the best and most recent authorities, as also in the minor detail of correctness of names, lettering, &c.

The printing of all new charts will come under this department.

#### No. 5. INSTRUMENTS.

The head of this department will take charge of and correct all compasses, and supervise the repairs of all instruments, &c., keeping the account of the same.

He will prepare for the charts the variation of the magnetic needle, and construct the epoch charts for variation, dip, and intensity, from which the magnetic curves and the constants of increase and decrease are derived. He will collect and arrange all magnetic data.

#### THE LIBRARY.

Particular attention will be given to the collection for the library of all works of reference relating to hydrography, such as voyages of discovery, sailing directions, travels, meteorology, marine surveying, magnetism of the compass, &c., and to the collection of all charts published at different periods.

General duties  
of the librarian  
—Continued. To these may be added, as circumstances admit, books relating to maritime and naval subjects, and any others containing scientific and useful information.

A catalogue will be kept of all works belonging to the library arranged under their proper heads."

#### ROUTINE OF DUTIES IN THE DIFFERENT DEPARTMENTS.

##### ROUTINE OF DUTIES IN THE DEPARTMENT OF ARCHIVES.

Routine duties  
in the Archives  
Department.

"From this department are issued the Hydrographic Notices and Notices to Mariners, an officer being assigned to this duty. To facilitate the work, one copy of each Admiralty and United States Hydrographic Office chart is kept in the Archive-room, arranged in cases and with index-books and boards showing the shelves upon which they are arranged. All other foreign charts are also kept in this room for reference.

The following method is pursued in getting out Hydrographic Notices and Notices to Mariners:

When foreign notices, or information which is intended to be published, are received by the Assistant Hydrographer from the Hydrographer, they will be sent to the head of the department of Draughting, who will examine them to see if they apply to the charts upon which he is working. He will then return them to the Assistant Hydrographer, who will have them carefully examined to see that they have not already been published from this office. Those that have not been published will be prepared for the printer, and the charts will be examined to see that no errors have been made in the latitude and longitude of places, and in bearings and distances. The bearings in these notices must be magnetic; those in foreign notices, with the exception of the English, are generally true. Care will also be taken that the orthography of proper names is correct.

When the notices are prepared for the printer they will be registered in the book prepared for that purpose, and will be inclosed in an envelope addressed to the chief clerk of the Bureau of Navigation, and a blank requisition will also be inclosed.

Notices issued  
to be docketed by  
the librarian. The envelope unsealed and inclosure will then be sent to the librarian, who will docket them in the 'Record of printed matter sent from the Hydrographic Office.'

When the proof is received by the Assistant Hydrographer, he will have it carefully compared with the copy, and when correct will have the proof and copy inclosed in an envelope addressed to the Government Printer, and on the envelope will mark "proof read." The envelope will be sealed and sent to the printer, who returns, when printed, the number of notices required by the requisition. The proof and the copy are retained at the printing-office.

When the notices are received from the printer by the clerk to the Hydrographer they are sent to the Assistant Hydrographer, who has them indexed in the index-book, a copy pasted in the file kept for that purpose, and one inserted in the corrected copy of the Sailing Directions, and the remainder are sent to the distributing-room (one number being marked with the squadron to which it appertains), to be distributed according to the list kept in that room. At present there are printed 350 of each kind of notices.

In the Archive-room there is also a case containing all original reports of surveys with accompanying charts and data, and all other hydrographic information arranged on shelves numbered to correspond with the sections into which the charts are divided. All papers, charts, &c., in this case are numbered, and an index-book is kept showing the shelves upon which they are stowed. The "remark-books" of commanders and navigators that have not been examined are kept in this case.

To carry on the duties of this department the following-named books are kept, viz :

1. Index of foreign charts, showing cases in which they are arranged, and containing names of charts, number, date, author. List of books, &c., kept in Archive Department.
2. Index to papers, &c., on hydrographic information, contained in a case, and arranged to correspond with the chart sections.
3. Index to Hydrographic Notices.
4. Index to Notices to Mariners.
5. Register of Hydrographic Notices and Notices to Mariners, containing number of notice, date, title, authority, date of proof read, date of notices received from printer.
6. File of United States Hydrographic Notices.
7. File of United States Notices to Mariners.
8. File of Light-House Board Notices to Mariners.
9. File of Dominion Government Notices to Mariners.

List of books,  
&c., kept by the  
Archive Department—Contd.

10. File of Trinity House Notices to Mariners.
11. File of British Admiralty Notices to Mariners.
12. File of Annonce Hydrographique.
13. File of Avviso ai Navigante.
14. File of general Notices to Mariners (New York Herald, &c.).
15. File of Aviso á los Navegantes.
16. Nachrichten für Seefahrer.
17. Hydrographische Mittheilungen.
18. Kundmachung für Seefahrer.
19. Noticias Hidrográficas.

The Hydrographic Notices and Notices to Mariners are issued from the distributing room according to the list posted in this room. The messenger, or, when absent, one of the laborers, attends to this duty. Twenty copies of each notice are retained, to be indexed and bound at the end of the year.

Light-House  
lists to be kept in  
Archive Department.

An officer attached to the Department of Archives is assigned to the duty of keeping the light-house lists corrected up to the latest date, and preparing each year the foreign light-house lists for publication. When these lists are in print and the proof returned to this Office, it will be corrected up to the date of reading.

This officer will also assist in reading proof of Hydrographic Notices and Notices to Mariners, as well as other proof of Sailing Directions.

The Library a  
part of the Arch-  
ive Department.

To the librarian, who is an officer attached to the Department of Archives, are assigned the following duties, viz:

- 1st. The arrangement and care of the library.
- 2d. The charge of all books issued to naval vessels or sold to agents by this office, with the keeping an account of the same.
- 3d. The recording of all requisitions for printing and binding.

First. The librarian will be permanently attached to this Office, if possible, that he may become familiar with all books, and be able to keep the Hydrographer informed of all recent publications, that the library may be as complete as possible in all works that would be of service to this Office.

Books to be cat-  
alogued, arrang-  
ed, &c.

The books of the library will be catalogued and arranged on shelves, properly numbered, so that any book can be quickly found. A record will be kept of all books taken from

the library, showing the name of the person taking them out, the date, and the date of return. Those who take books from the library will be responsible for their condition while in their possession, and will return them promptly when they have finished with them. No books will be taken from the Office except by permission of the Hydrographer.

A table with sections will be arranged for magazines and papers, the files of which will be carefully preserved for binding.

Upon the receipt of a new book the library mark will be pasted on the inside of the cover, the book will be catalogued, and will then take its place on the shelf to which it belongs. All new books, or new editions of books, received will be handed to the Hydrographer for his inspection.

Second. A room is especially appropriated for the books issued from this Office to vessels and agents, which will be used for no other purpose.

Obsolete editions of works, old books, papers, &c., which are of no service, will be stowed in a separate room until they can be disposed of.

The "issuing room" will be arranged with shelves to contain all the books issued from this Office.

The books will be properly catalogued, showing the full title, author, edition, size, date; and, when mentioned, by what authority printed (as Admiralty, Bureau of Navigation, &c.), and the index will show upon what shelves they are stowed.

When books are superseded or removed from the catalogue they will be removed at once from the issuing room to the room containing useless books, &c. When corrections or additions have been made to any work, only the last edition should be issued, as it is important that navigators should have the latest information.

That the supply may be kept up, and the Hydrographer may ascertain at any time the number of books on hand, a receipt-book, an expenditure-book, and ledger are kept. The receipt-book shows the date of receipt, title of book, from whom received, and the number. The expenditure-book shows date of issue, title of work, to whom sent, and the number. The ledger shows the number of the shelf, title of book, and the number received, issued, condemned, and on hand for each quarter of the year (ruled for two years).

Persons taking  
books from the  
library to be re-  
sponsible for  
them, &c.

Obsolete books  
to be stowed in a  
separate room.

Method of keep-  
ing a record of  
books received,  
&c.

*Books to be added to or removed from, the library list only by order of the Hydrographer.* The Hydrographer will issue a written order to place a book on or remove it from the catalogue of books issued.

All books published by this Office will have the price printed on the title-page.

Third. All requisitions for printing or binding to be done at the Government Printing-Office are recorded in a book kept in the library for that purpose, showing the date, description, and title of work, number of copies, specific instructions, and, when practicable, the date returned.

These requisitions are sent in an unsealed envelope to the Bureau of Navigation, where the signature of the chief clerk is procured, and a press copy is taken of the requisition. It is then forwarded with the work to the printer.

*Additional duties of the Assistant Hydrographer.* In addition to the above, it will be the duty of the Assistant Hydrographer to ascertain and record the most recent and trustworthy of the observations for determining geographical positions in different parts of the world. A book is kept in the Archive room for recording these.

It will also be his duty to keep a record of all reported dangers in the manner prescribed by the instructions accompanying the 'Record of Reported Dangers.'

#### ROUTINE OF DUTIES IN CHART DEPARTMENT.

- Routine duties in the Chart Department.*
1. To keep on hand, by timely requisitions, a proper supply of admiralty and Coast Survey charts, say 10 copies of each, in issue.
  2. To keep accurate accounts of all issues, sales, receipts, and expenditures of charts, chart-paper, &c. The ledger will be posted quarterly.
  3. To keep all charts properly marked with shelf and chart numbers, and keep them in their proper sections and on their proper shelves.
  4. To keep a due proportion of charts backed.
  5. To supply charts to vessels, agents, stations, &c., as may be required and directed.
  6. To receive, survey, and correct the charts turned in from vessels and stations.
  7. To keep on hand, by printing, a proper supply of charts from all the corrected plates belonging to the Office, say 20 to 30 copies of each.
  8. To keep on hand the requisite supply of chart-paper, chart-boxes, portfolios, and material for backing charts.

9. To keep all charts on hand corrected up to date from the Hydrographic Notices and Notices to Mariners. The corrections to be made and noted according to the instructions from the Bureau of Navigation. (See Appendix A.)
10. To keep all Admiralty charts on hand corrected by the latest issues of the same received.
11. To keep for reference a correct list of charts on hand, together with their section and shelf numbers.
12. To keep copies of all requisitions for, and receipts of, Admiralty charts.
13. To keep a list of all plates and stones on hand and received.
14. To supply the department of Archives with copies of all new and corrected Admiralty charts and catalogues received.
15. To keep corrected issuing catalogues.
16. To revise and re-issue Hydrographic and issuing catalogues as often as required by the many changes therein.
17. To cancel, by stamp, all Admiralty charts as soon as superseded by the issues from this Office.
18. To inform the Assistant Hydrographer of any errors discovered in any of the Hydrographic Notices or Notices to Mariners.
19. To supervise all work done in the printing room.
20. To provide outside shelves for all charts which cannot be stowed in the chart-room.
21. To inform the head of the department of Draughting of corrections to be put on the office plates.
22. To see the condemned charts, papers, &c., properly disposed of.
23. To inform the Hydrographer when Admiralty charts are received, and to submit for his inspection copies of all new charts received.
24. To inform the Hydrographer of all Deficiencies in the Chart department, and make out requisitions to fill the same, as he may direct.
25. To supply draughtsmen with such charts as they may require in the Draughting department.
26. To require from the head of the department of Draughting a weekly account of all charts expended in his department.
27. To supply to officers compiling Sailing Directions such charts as they may require for reference.

Routine duties  
in the Chart De-  
partment.— Con-  
tinued.

Routine duties  
in the Chart De-  
partment—Con-  
tinued.

28. To mark and forward, as may be directed, all boxes, packages, &c., sent from the Chart department.
29. To supply agents, stations, &c., as may be required, corrected copies of the Hydrographic Office catalogues of charts and books.
30. To keep on hand a correct Coast Survey catalogue of latest date.
31. To be provided with an Admiralty catalogue of latest date, and keep the same posted up to date from the English Nautical Magazine.
32. To cancel the French charts as fast as superseded.

Two rooms are assigned to the Chart department, one containing the British Admiralty charts, and the other containing the Hydrographic Office, Maury's Wind and Current, Coast Survey, and French charts.

The charts are catalogued and divided into sections as given in Appendix B, and the shelves are divided into corresponding sections, with a number to each shelf. Any particular chart can be found by referring to the catalogue, when opposite the number of the chart will be found the number of the shelf upon which it is stowed.

A set of books is kept in each room showing the receipts and expenditures of all charts, paper, &c.

The Admiralty agent furnishes the Office without special requisition with twelve copies of all new charts issued from the Admiralty office, and three copies of all charts of old issue, but containing late corrections. Admiralty charts reach this office in from four to six months from the time they are required. When a lately corrected Admiralty chart is received which has been canceled by an Hydrographic Office chart, it must be sent to the Hydrographic room, and the charts therein corrected from the Admiralty chart.

When an Hydrographic Office chart is to receive extensive corrections, the first copy is to be corrected by a draughtsman, and then used as a guide by the officer who corrects the remainder.

Agents, dealers, and purchasers are supplied only with the charts published by this Office.

The last copy of an Admiralty chart is never to be issued, and no more French charts are to be required.

When the number of Admiralty or Coast Survey charts on hand is reduced to or below five copies others should be required. With five copies of any of these charts on hand

only five additional copies will be required, but with a less number than five, ten new copies will be required.

Routine duties  
in the Chart Department — Continued.

The charts in issue will be corrected at the end of every even-numbered quarter in order to verify and correct the ledgers.

When an office plate is corrected strike off from it at once from twenty to thirty copies, and should these differ materially from the old copies on hand, the latter are to be destroyed, and the various stations supplied with the new ones, with orders to destroy the old ones on hand. When a plate is corrected the date of latest correction should be entered in the catalogue.

Naval vessels on fitting out are supplied from this Office with all the charts belonging to the station to which they are ordered, as shown by the issuing list.

Squadrons will be furnished with copies of all new charts, as follows: Two copies of Admiralty charts will be sent to the flag-ship of the squadron to which they pertain, and in the case of new Hydrographic Office charts, one copy for each vessel of the squadron to which they pertain, will be forwarded to the flag-ship for distribution.

The Mare Island navy-yard is to be furnished with copies of all new charts affecting the Pacific stations, and also with all new catalogues."

#### ROUTINE OF DUTIES IN THE METEOROLOGICAL DEPARTMENT.

"The detail of duties in this department is fully given in the forms and blanks which have been approved for the construction of wind and current charts."

#### ROUTINE OF DUTIES IN THE DRAFTING AND ENGRAVING DEPARTMENT.

"All the charts and sketches published by the Office are drawn in this department, or revised, if they have been received in a form which the Hydrographer deems proper for publication.

Routine duties  
in Department of  
Drafting and Engraving.

The head of the department will inform himself carefully in regard to all hydrographic information which affects charts to be published. If any exists which is not in the archives of the Office he will report it to the Hydrographer. He will

Head of the Department of Drafting, &c., to carefully collect and review all the information obtainable, and report to the Hydrographer any discrepancies for his decision. He will direct the labors of the draughtsmen, and will be responsible for the correctness of their work.

The field-work of surveying vessels or the detail accompanying any chart sent from other vessels will be given to the head of this department for his revision or for the replotting of the work, if necessary, and he will see that all final corrections (of the chronometers, errors, and rates, soundings, bearings, angles, &c.), have been applied, or apply them.

The head of the department will revise, and if necessary recompute the astronomical observations for position and the magnetic observations for declination. He will superintend the replotting, aided by the advice of the surveyor, if obtainable, and is responsible for its correctness. He will bring to the notice of the Hydrographer any incompleteness or discrepancy in the field-work.

All engraving, lithographing, &c., in charge of the head of Department of Drafting and Engraving. All the engraving, lithographing, photo-lithographing, &c., done in the Office, and outside of it, is under the supervision of the head of this department, who will see that the intentions and directions of the Hydrographer are carried out.

He will read and correct all the proofs, and will be responsible for the final correctness of the plates. He will see that the plates, stones, &c., from which the charts are printed, are always corrected to date from the Hydrographic Notices and Notices to Mariners, as well as from all other information received at this Office.

The draughtsmen and engravers are under the immediate direction of the head of this department, who will report to the Hydrographer any neglect of duty on the part of any of them."

*Process of photolithographing introduced in the Office.* Within the year 1871 the method of reproducing charts by the process of "photolithographing" was introduced in the Office.

Papers were issued on the "Northern and Eastern limits of the Gulf Stream," translated from the German of Dr. Peterman; on the "General Navigation of the Oceans and the Mediterranean Sea," and on "The Marshall Group" of islands in the Pacific; also a "List of Reported Dangers in the Pacific, north of the Equator," was compiled and published.

*Publications of the Office.* Of the sixty-six charts published twenty-two were republications from the corrected plates of the North Pacific Surveying Expedition, forty-three republications of foreign

charts by the lithographic process, and one a chart of Jamestown Harbor, from a survey made by the officers of the Jamestown.

FISCAL YEAR ENDING JUNE 30, 1872.

Through the efforts of the Hydrographer an appropriation of \$50,000 was passed by Congress in 1871 for the survey of the Pacific Ocean. In consequence of this appropriation the U. S. S. Narragansett was employed during the year, under instructions prepared in the Hydrographic Office, in surveying a number of islands lying on or near the route between San Francisco and Australia; and, as fast as the results of these surveys were received, they were published by the Office.

Reports of surveys made by naval vessels.

The estimates for hydrographic work during the succeeding fiscal year, submitted by the Hydrographer in his Annual Report for 1872, being considerably in excess of the amount appropriated for the current year, called forth from a member of the Appropriation Committee of Congress a request for an explanation of the reasons for the increase, to which the Hydrographer made the following answer:

HYDROGRAPHIC OFFICE,  
Washington, D. C., January 10, 1872.

Hon. EUGENE HALE, M. C.:

SIR: Replying to your inquiry as to cause of the increase in the appropriation required for the fiscal year ending July, 1873, over that appropriated for the present fiscal year, I would state that it is, in part, owing to the amounts which accrue from sales of the Office publications being now covered into the Treasury, thereby depriving this Office of a sum heretofore credited to the appropriation of the Bureau of Navigation and expended for the support of the Hydrographic Office. This amount was \$5,379.45 in 1870, and \$6,569.01 in 1871.

Letter of Hydrographer to a member of the Appropriation Committee of Congress.

From the facilities thus far afforded to this Office its issues of charts and books cover but a small portion of the navigable globe. At the present moment the Office is able only to furnish to commerce three hundred and eleven charts of different seas. The number issued by the British Hydrographic Office is about 3,000, all of which are called for to fill the demands of navigators.

Comparison of the number of British charts with our own.

Object of the Office. It is the object of this Office to so progress, gradually supplying its own publications to our marine, that we may finally be independent of foreign supply and may cease to pay for the support of foreign offices and foreign labor. For this object, the gradual meeting of the demands of our commerce and mounting our issues in the most economical manner, the remainder of the amount over last year's appropriation was asked.

The Charts and Sailing Directions from this Office, as they can be brought out, are gradually taking the place of those of England with our marine. Could larger appropriations be given it would be able, so much the earlier, to be independent, as far as such an office can be, of all foreign offices.

In this connection will you permit me to ask your attention to the recommendation made in my letter accompanying the estimates (addressed to the Chief of the Bureau of Navigation, who authorizes me to mention those subjects relating to

Recommends the purchase of the building occupied by the Office. this Office), that it would be much better for the Government, and for the Office, to own the building in which it is located.

At present the yearly rent of the building is \$2,000 and the repairs average about \$800. Valuable material is constantly accumulating in it which would always be injured by removal, setting aside the expense of removal and refitting. This building, with moderate repairs and slight additions, would, with the ground attached, answer the purpose for all time. It can be purchased and refitted for \$50,000, the property being valued at \$40,000.

May I also ask your interest on the subject of prosecuting foreign surveys as recommended in the Report of the Secretary of the Navy, page 13. These require but a comparatively small appropriation in comparison to their importance to commerce and navigation.

Could you spare the time to visit this Office, I should take pleasure in pointing out to you what is doing at present, what has been done, and what I hope to do for the future of the Office.

Very respectfully, your obedient servant,

R. H. WYMAN,

*Captain, U. S. Navy,*

*Hydrographer to the Bureau of Navigation.*

Publications of the Office. During the year there were published "Sailing Directions for the English Channel;" "The Physical Geography

of the Sea," translated from the German of Capt. W. Kropp, <sup>Publications of the Office—Continued.</sup> by E. R. Knorr; a pamphlet on "Hurricanes, with Nautical Directions for avoiding and maneuvering in them;" "Steam Lanes across the Atlantic," and a pamphlet on "Running Surveys." One hundred and seventeen charts were published, of which twenty-five were republishations from the plates of the North Pacific Surveying Expedition, eighty-nine reproductions of foreign charts by the lithographic process, and one a chart of Ferrol Bay from surveys made by the officers of the Ossipee.

FISCAL YEAR ENDING JUNE 30, 1873.

During this year, a running survey was made of the east coast of Mexico, from the mouth of the Coatzacoalcos to that of the Rio Grande, by the U. S. S. Wyoming, Commander F. H. Baker; surveys were also made by our vessels in the West Indies, on the east coast of South America, and in the Gulf of California. The Portsmouth, Commander J. S. Skerrett, was employed in investigating dangers between the Sandwich Islands and our Pacific coast, and made special surveys of Palmyra, Washington, and Christmas Islands. The Narragansett, Commander George Dewey, made a running survey of the coast from San Diego to Cape Corrientes. The Tuscarora, Commander George E. Belknap, was employed in taking deep-sea soundings in the Pacific; and accurate depths were ascertained along a line 1,000 miles in length, extending from Puget Sound toward the island of Atcha in the Aleutian group.

Upon the breaking out of the Civil War, the plan adopted by Maury of soliciting meteorological data from merchant vessels, for the construction of charts, was discontinued. But in 1873, it was decided to again commence the collection of information from merchantmen, and from our men-of-war, for the purpose of accumulating matter for a new edition of Maury's Charts, and requests for such data were accordingly sent out to the Navy and merchant marine.

In addition to the hydrographic work performed by naval vessels before mentioned, reported dangers were investigated, and special surveys of islands, harbors, coasts, &c., were made by our ships on foreign stations, and all results, as fast as received at the Office were published and sent out for general information. (Report of Secretary of the Navy,

<sup>Reports of surveys, &c., made by naval vessels.</sup>

<sup>Special surveys, &c., made by naval vessels.</sup>

Publications of 1873.) The publications of the year were, "Sailing Directions for the Atlantic Ocean," translated from the French of F. Labrosse, by Lieutenant Commander Coghlan; of "The Cape Verde Islands," compiled by Lieut. W. H. Parker; of "The West Coast of Africa, from Cape Spartel to Sierra Leone," translated and compiled by Lieut. Commander H. H. Gorringe, and a pamphlet on "Routes of Mail Steamers between the English Channel and New York;" also eighty-nine charts were published, seven of which were republications from corrected plates of the North Pacific Surveying Expedition, two were charts of the extreme southern part of America, and eighty reproductions of foreign charts by lithography.

#### FISCAL YEAR ENDING JUNE 30, 1874.

A Meteorological Journal was prepared in the Office and issued to merchant vessels and others for their greater convenience in recording information for the correction and con-

Meteorological journal issued to merchant vessels. tinuance of the "Wind and Current Charts." The survey of the Pacific, along the coasts of the peninsula of Lower California, in the Gulf of California, and around the Revilla Gigedo groups of islands, was continued by the Narragansett, under Commander Dewey; but the want of an adequate appropriation for carrying on the survey made it necessary to withdraw the Portsmouth from hydro-

Reports of surveys, &c., made by naval vessels. graphic work. The Fortune, under Lieut. Commander F. M. Green, completed the running survey of the east coast of Mexico, begun in the preceding year by the Wyoming, and in addition made a series of offshore soundings along the Mexican coast; while the Tuscarora finished her deep-sea soundings in the Pacific.

A survey of the mouth of the Rio de la Plata was made by the officers of the Wasp, on the South Atlantic Station, and vessels on other stations made similar surveys, or investigations, generally at the suggestion of the Hydrographer. Results of such surveys, made by the Shawmut, Commander H. L. Howison; the Kansas, Commander A. V. Reed, and the Wasp, Commander A. T. Mahan, were received at the Hydrographic Office within the year, and published as soon afterwards as practicable.

A party was organized in the Hydrographic Office for the purpose of establishing by means of the electric telegraph the longitude of places in the West Indies, and on the northern coast of South America, at points where the submarine cable had been landed. This expedition sailed from Norfolk on the 22d of November in the Fortune, commanded by Lieut. Commander F. M. Green.

During the year there were published "Sailing Directions for the Northwest, West, and South Coasts of Spain, including the coast of Portugal from Point Estaca to Cape Trafalgar;" "The Azores, Madeiras, and Cape Verde Islands," and a pamphlet on the "Voyage of the Vaudreuil through the Patagonian Channels and Magellan Strait," all translated by Lieut. G. M. Totten; also, a volume on the "Navigation of the Pacific Ocean," translated by Lieut. J. W. Miller. Of the sixty-four charts published, eight were engraved and fifty-six lithographed. Among those engraved were two sheets each of the North Pacific Ocean, the Inland Sea of Japan, and the Northeast Coast of North America series; also one each of the Newfoundland and East Coast of South America series.

#### FISCAL YEAR ENDING JUNE 30, 1875.

The failure of Congress to make an appropriation for continuing the survey of the Pacific caused the withdrawal of the Narragansett from that duty, after having completed the work of re-examining portions of the Gulf of California. Cruising vessels on the several stations, however, continued to make frequent surveys and to forward the results to the Hydrographic Office; but the want of an adequate appropriation rendered it necessary to postpone the engraving of most of these charts. Reports of such surveys, or examinations of reported dangers, were received from the Ossipee, Commander Ramsay; from the Wasp, Commander Kirkland; the Brooklyn, Captain Truxtun; the Canandaigua, Captain Barrett; the Ashuelot, Commander Matthews; the Omaha, Capt. P. C. Johnson, and the Monongahela, Captain Thornton. The commanding officers of the Canandaigua and Wasp having changed within the year, additional reports were received from each of these vessels, the former under Captain Lowry, and the latter under Commander Mahan.

Party organized  
to determine lon-  
gitude by tele-  
graph.

Publications of  
the Office.

Reports of sur-  
veys, &c., made  
by naval vessels.

Publications of the Office. During the year there were published, "Sailing Directions for the South and East Coasts of Spain from Mala Bahia to Cape Creux;" "The Balearic Islands and North Coast of Africa from Ceuta to La Cala," translated and compiled by Lieut. Commander H. H. Gorringe; "The West Coast of Africa from Sierra Leone to Cape Lopez," translated and compiled by Lieut. L. Chenery, and of "The Rio de la Plata," translated by Lieut. Commander H. H. Gorringe. Forty-six charts were published, of which seven were engraved and thirty-nine lithographed. Among those engraved were one of Newfoundland, one of the Pacific Ocean series, one of Montevideo and its approaches, and two of the west coast of the Gulf of Mexico, the last named from surveys made by the officers of the Wyoming and Fortune.

Expedition to West Indies established November to determine longitudes by telegraph, successfully established the longitudes of Panama, Aspinwall, &c. The expedition to the West Indies, sent out in the previous November to determine longitudes by telegraph, successfully established the longitudes of Panama, Aspinwall, Santiago de Cuba, and Havana. An observing station was also established at Key West, but the appearance of yellow fever among the islands caused the recall of the party until a more favorable season.

#### FISCAL YEAR ENDING JUNE 30, 1876.

Work of establishing longitudes by telegraph, continuing. During this year the work of determining longitudes by telegraph was continued by the party under Lieutenant Commander Green, in the Gettysburg, and successfully completed. In addition to the places before established the longitudes of the following ports were determined: Kingston (Jamaica); San Juan de Puerto Rico; St. Thomas; St. Croix; St. John (Antigua); St. Pierre (Martinique); Bridgetown (Barbadoes); Port Spain (Trinidad).

The idea of employing the electric telegraph in determining differences of longitudes is eminently an American one, and proved its superiority over every other method by the accuracy of its results.

On the return to the United States, after completing her work in the West Indies, the Gettysburg ran a line of soundings from Saint Thomas, via Bermuda, to the Capes of the Chesapeake.

Soundings taken by the Gettysburg.

In September of this year preparation was begun in the Office of a new series of meteorological charts of the North Pacific, from data which had accumulated during previous years from the reports of merchant vessels and logs of our men-of-war.

The publications of the year were "Sailing Directions for the Coasts and Ports of the Bay of Biscay," and for the "Coasts of Chile, Bolivia, and Peru;" also fifty-two charts were published, of which five were engraved, and forty-seven produced by the lithographic process. Among those engraved were a set for the Bay of Fundy, and a number of coast and harbor charts for Lower California, from surveys by the officers of the Narragansett.

The absence of adequate appropriations for hydrographic work greatly hampered the operations of the Office. Many of the results of surveys sent in by vessels, after having been verified and put into shape for publication in the Office, remained unissued for want of funds. Such new charts as were engraved during the year were limited to those imperatively demanded by the immediate necessities of the navy or of the commercial marine. Although the successive Hydrographers, in their annual reports, had regularly asked for means for prosecuting the work of the Office, and for the continuance of the survey of the Pacific, the necessary appropriations had been as regularly refused.

But a gratifying interest in furthering the objects of the Hydrographic Office was manifested by the people at large, and prominent citizens of New York, Philadelphia, and other seaport cities, united in their appeals to Congress in its behalf.

To a letter announcing such an action on the part of merchant captains, ship owners, underwriters, and others, in the city of Philadelphia, the Hydrographer sent the following reply, which clearly indicated the condition and wants of the Office at this period :

U. S. HYDROGRAPHIC OFFICE,  
Washington, D. C., October 16, 1876.

GENTLEMEN: Yours of October 13, informing me that a request was being signed by the leading merchants, insurance companies, &c., urging upon Congress a liberal support of the U. S. Hydrographic Office, is received.

Preparation begun of a new series of meteorological charts.

Publications of the Office.

Interest in the Office shown by the people at large.

Letter of Hydrographer to merchants, &c.

Desire of the Hydrographer to make the Office independent of foreign offices. Taking, as I do, the greatest interest in the advancement of this Office, so necessary to our marine, both commercial and naval, and feeling that it ought to be a matter of national pride that our Government should be wholly independent in every matter relating to the furnishing of the charts and books required in navigation, I thank you.

Six years ago this Office was but a depot of foreign charts, with a few plates from the expeditions of Wilkes and John Rodgers, together with plates then recently purchased from George Blunt. Since that time all these old plates have been corrected and kept so. New charts have been added, books of sailing directions have been written and issued, and this with a very meager appropriation, with a small but hard-working force, and the assistance of officers of the Navy of proved ability.

*Survey of the Pacific stopped for want of appropriate appropriations.* A survey of the Pacific Ocean, peremptorily demanded by the interests of commerce, was, on a fortunate appropriation of one year, commenced, and the coast of Lower California and the Gulf surveyed; but there it stopped. No further appropriation could be obtained, not even to add to our force to get the work of the survey out promptly, and engrave the plates, and I have had the mortification to see that, while we are delving along with our inadequate force and means, "robbing Peter to pay Paul," to get our own work in condition to engrave, and to find some way in which it can be done, the British Admiralty Hydrographic Office, always alive to the requirements of commerce, has engraved our work.

This survey, instead of being continued until every obstruction to navigation, until every danger in the Pacific was located, and every doubtful danger examined, had to be dropped for want of a few thousand dollars to continue it; at least I asked for the engraving of work done, and for the continuance of the survey, but \$25,000 per year, with such assistance as the Navy Department was able to afford, but this also fell through.

Memorials made to Congress by the merchants, &c., of New York and other commercial cities, have been passed over without even a glance, and the interests of our commerce appear to have been but a zero with our legislators.

*Unsuitableness of the building occupied by the rented building, now occupied as an Hydrographic Office.* For five years I have pointed out the insufficiency of this rented building, now occupied as an Hydrographic Office, not only from the want of space, but, most seriously, as not

being in any way fire-proof. The valuable and constantly increasing charts, books, plates, and archives are at the mercy of an accident.

Charts, plates,  
books, &c., ex-  
posed to danger  
from fire.

Commerce is now commencing to look upon and depend upon this Office for its supplies; it cannot afford, for the want of a few thousands of dollars' expenditure for a fire-proof building, to risk a loss which could not be replaced.

For five years I have asked an appropriation for this purpose, and estimated that, in accordance with my plan, \$90,000 would supply to the Government a safe and protected property, which, in ten years, would be worth double that money. Now the printing of this Office is carried on in cellar rooms so damp and rotten that no private party would think of using them; and make-shift rooms have had to be fitted up in the loft of a stable, for draftsmen and stowage.

This year, as heretofore, I ask again for a proper building, and that such should belong to the Government. I ask a small sum to continue surveys, and, for carrying on the ordinary work of the Office, the most limited amount that will admit of any progress.

For me, I would exert every nerve to place this Office, as quickly as possible, on a footing with the foreign offices, and know that, in the interest of our commerce, the comparatively small expenditure would be a good national investment.

Our national pride, at least, should stand in the way of our country paying for or receiving supplies of charts, &c., required for our marine from a foreign power, when we have an ability at least equal to theirs, to furnish them for ourselves.

I would suggest that a definite amount be asked for, to be used at once, outside of the yearly estimates, viz:

For a suitable building .....	\$90,000	A n a m o u n t asked for the pur- chase of a suit- able building for the Office.
To continue the Pacific survey, complete and en- grave the work already done, and to add, as quickly as possible, to the issues of the Office for the benefit of commerce .....	\$35,000	

I may add, that very soon I shall have completed the first part of the West Indies, and the third part of the West Coast of Africa, and have now a volume of deep-sea soundings, which, from the inadequate appropriation for the Navy Department

printing, I am, and will be, unable to publish until further appropriation is made.

I believe, my dear sirs, that I have given you a little insight into our situation.

Very respectfully, your obedient servant,

R. H. WYMAN,

*Commodore, U. S. N., and Hydrographer.*

Messrs. RIGGS AND BROTHER,

221 Walnut Street, Philadelphia, Pa.

FISCAL YEAR ENDING JUNE 30, 1877.

Continuance of  
the construction  
of Meteorologi-  
cal Charts.

During 1877 the preparation of the Meteorological Charts of the North Pacific Ocean, begun in the preceding year, was continued, and at the close of that year they were ready for publication. They extended from the equator to latitude 45° north, and from the west coast of the United States westward to the 180th meridian. These charts were constructed by Lieut. T. A. Lyons, assisted from time to time by a number of other officers, and gave for each month of the year data concerning the "winds, calms, fogs, rain, squalls, weather, barometer, and temperature of the air, and of sea water at the surface." Lieutenant Lyons followed the system adopted by Maury of dividing the surface of the ocean into sections of 5° longitude by 5° latitude, and his charts were arranged to show both graphically and descriptively the information they contained.

Searches for reported dangers, special surveys, &c., were made during the year by vessels on the several stations,

Report of sur-  
veys, &c., made  
by naval vessels

and reports of such surveys or examinations were received from the Pensacola, Captain Gherardi; the Vandalia, Commander Robeson; the Frolic, Commander G. B. White; the Adams, Commander F. Rodgers; the Plymouth, Captain Barrett; the Ossipee, Commander S. L. Breese, and the Gettysburg, Lieutenant-Commander Gorringe.

The Gettysburg was employed during a portion of the year in making surveys and collecting information concerning the Mediterranean Sea at places where the Sailing Directions were deficient. On the voyage from the United States to Europe, the Gettysburg made a series of deep-sea soundings between the Azores and the Strait of Gibraltar, and discovered a bank with but thirty fathoms of water in

Soundings ta-  
ken by the Get-  
tysburg.

its shoalest spot. Another bank was discovered during the year on the coast of Brazil by the Adams, Commander Rodgers, and Frolic, Commander G. B. White, while engaged in searching for reported dangers to navigation. The Essex, Commander Schley, ran a line of soundings from Cape Henry to St. Paul de Loando, on the west coast of Africa; and thence, via the Island of St. Helena, to Cape Frio, Brazil. All soundings as soon as received at the Office were entered on the charts affected by them.

All this hydrographic work was simply incidental to the regular naval duties of the vessels named, no appropriations having been made for surveying purposes.

The Huron, Commander Ryan, was employed in determining the longitudes of places on the north coast of South America and adjacent islands, by carrying chronometers from well-established positions at Aspinwall and Port Spain, Trinidad. The following positions were thus determined: Testigos Islands; Puerto Santo Bay; Pampatar, Island of Margarita; Cumana; Tortuga Island; Corsarios Bay; Orchla Island; Los Roques Island; La Guayra; Puerto Cabello; Island of Curaçao; Vela de Cora; Orange-Stadt; Estanquez Point; Bahia Honda; Cape La Vela; Santa Marta, and Cartagena.

The completion of the cable line from Lisbon to Brazil, via Madeira and the Cape Verde Islands, and the success of former expeditions for determining longitudes by telegraph, induced the Navy Department to send out another expedition to establish the positions of the principal ports on the east coast of South America. It was decided that the Royal Observatory at Lisbon should be the initial station. On the 29th of October, 1877, the expedition again under Lieut. Commander F. M. Green, sailed from New York on the Guard, and arrived at Lisbon on the 30th of the following November.

Sailing directions were published during the year for "The Caribbean Sea and Gulf of Mexico, including the Bahama and Bermuda Islands," compiled by Lieut. Commander F. M. Green; "The English Channel;" for "The West Coast of Africa from Cape Lopez to the Cape of Good Hope, including the islands in the Bight of Biafra and the islands of St. Helena and Ascension," translated and compiled by Lieut. Commander J. R. Bartlett.

Discovery of a  
bank on the coast  
of Brazil.

Longitudes de-  
termined by  
transporting  
chronometers.

Expedition  
sent out for de-  
termining lon-  
gitudes by tele-  
graph.

Publications of  
the Office.

Publications of  
the Office—Con-  
tinued.

Of the thirty-five charts published by the Office during this year ten were engraved and twenty-five lithographed. Among those engraved were several from the Narragansett's survey on the Pacific coast and one sheet of the North Pacific Ocean.

FISCAL YEAR ENDING JUNE 30, 1878.

Early in this year the meteorological charts of the North Pacific were published by the Office. Work was also commenced on the preparation of similar charts for all parts of the Atlantic. In October of the preceding year, in order to encourage the merchant marine to collect information for these charts, blank books had been prepared and sent out to ship-masters who desired to co-operate in collecting information, requesting that they be filled and returned to the Hydrographic Office. These blank books contained forms for a complete meteorological record during a voyage of three months at sea, together with instructions for the use of the barometer, thermometer, &c. A set of blanks, instructions, &c., was likewise issued to vessels of the Navy, with directions requiring the observations to be compiled by the navigator of the ship with especial reference to their use in the construction of meteorological charts.

*Captain Frank-  
lin ordered as Hy-  
drographer.*

On the 17th of May, 1878, Capt. S. R. Franklin relieved Captain Wyman as Hydrographer.

The work of the Gettysburg, collecting hydrographic information concerning the Mediterranean, was brought to a close when nearly completed by an accident to her machinery. The Guard, under Lieut. Commander F. M. Green, established by means of the telegraph the difference of longitude between Lisbon and Madeira, the Cape Verde Islands, and Pernambuco; also between Rio de Janeiro, Montevideo, and Buenos Ayres. Soundings were made by the Tuscarora, Commander J. W. Philip, along the coast of Lower California; and surveys of Tartar Shoal, and portions of the west coast of Mexico, were made also by the same vessel.

Publications of  
the Office.

During the year sailing directions were published for "The Mediterranean Sea, comprising the South Coast of France, the West Coast of Italy, the Tuscan Archipelago, Corsica, and Sardinia," compiled by Lieut. Commander H. H. Gorringe and Lieut. Seaton Schroeder.

Twenty-four charts were published, of which fifteen were engraved and nine lithographed. Among those engraved were one of the Irish Channel, one of the Bermuda Islands, and a number from the Narragansett's survey in the Pacific.

Publications of  
the Office—Con-  
tinued.

FISCAL YEAR ENDING JUNE 30, 1879.

During this year important surveying work was done on the west coast of Mexico, from Mangrove Point to Port Ventosa, by the Tuscarora, Commander Philip; and also by the Narragansett, Commander Dewey, along the same coast from the boundary line of the United States to Cape Corrientes. The Jamestown, Commander Beardslee, made a survey of the harbor of Sitka, Alaska, and marked a number of channels with buoys and beacons. Whenever the results of a survey that embraced any part of the coast of the United States were received at the Hydrographic Office, such data were at once transmitted to the Coast Survey Office. This course was required by the act of Congress passed June 21, 1886, which placed the Superintendent of the Coast Survey directly in charge of the survey of the coast of the United States, including Alaska. The work of the Hydrographic Office was thus restricted to coasts and waters outside the boundaries of the United States, yet the navigating charts published by the Hydrographic Office for the use of vessels entering or leaving our seaports have necessarily represented the salient features of the coast of this country.

Relations of  
Hydrographic  
Office with the  
Coast Survey Of-  
fice.

In the summer of 1879 the Hydrographic Office was removed from the "Old Octagon House" and transferred to quarters in the new building for the State, War, and Navy Departments. A part of the Office was, however, temporarily located in the old Navy Department building.

Transfer of the  
Hydrographic  
Office into the  
building for  
State, War, and  
Navy Depart-  
ments.

The meteorological charts were continued during this year, and their sphere was extended to the North and South Atlantic Oceans. A number of the blank books sent out to merchant vessels in the previous year were returned to the office with the information desired.

After completing the lines of deep-sea soundings across the Atlantic, the Essex, Commander Schley, made an examination of the approaches to the Rio de la Plata, and forwarded the results to the Office.

Examination of  
the approaches  
to the River  
Plate.

**Establishment of a department of longitudes in the Office.** The important and accurate work accomplished by Lieutenant Commander Green, and the party under his charge, in determining longitudes by telegraph, induced the Hydrographer to establish a "Department of Longitudes" in the Hydrographic Office. The object of this department was to verify the results of observations made for determining the geographical positions of places the latitudes and longitudes of which were uncertain or unknown.

**Publications of the Office.** Sailing directions were published during the year for "The Mediterranean Sea, comprising the Coasts of Tunis, Sardinia, the Sicily and Malta Channels, Lipari Islands, Island of Sicily, Strait of Messina, and the Coasts of Tripoli, Egypt, and Syria," compiled by Lieut. Commander H. H. Gorringe, and Lieut. Seaton Schroeder; also a "List of Reported Dangers to Navigation in the Pacific, South of the Equator," compiled by Lieut. J. E. Pillsbury. Of the eleven charts published, six were engraved and five lithographed. Extensive corrections were also made upon the plates of charts previously published.

#### FISCAL YEAR ENDING JUNE 30, 1880.

**Plan of issuing quarterly statements adopted.**

During the year, 1880, the Hydrographer adopted the plan of issuing quarterly statements of the operations of the Office. By an act of May 3, 1880, an appropriation of \$11,000 was passed for preparing and publishing the surveys of the Amazon and Madeira Rivers and their approaches; also one of \$12,000 for preparing and publishing the surveys of the Pacific coast of Mexico.

Work was still continued on the Meteorological Charts of the North and South Atlantic Oceans; and in addition to hydrographic information regularly forwarded by our naval vessels, data for the construction of such charts were received from a greatly increased number of merchantmen.

One of the chief aims of the Hydrographic Office being to render the United States independent of foreign Governments, by publishing its own charts and sailing directions,

**Naval vessels encouraged to make surveys, &c.** our men-of-war, in the absence of appropriations for the employment of regular surveying vessels, are encouraged to make special surveys and explorations at every opportunity, in addition to their strictly naval duties. As the results of these surveys and investigations accumulated

general charts of portions of the North Atlantic, Pacific,

and Indian Oceans had been, from time to time, issued by the Office. The preparation was begun, in 1880, of similar navigating charts of the South Atlantic upon a scale uniform with the general charts already published. As these charts of the South Atlantic were successively issued they were substituted for those printed from the plates originally purchased from the Messrs. Blunt.

A copy of a survey of the Sandwich, or Hawaiian, Islands, made by that Government, was received at the Office in 1880; as were also results of the survey of the west coast of Mexico, from Mangrove Bluff to the Gulf of Fonseca, made by the Tuscarora, under Commander Philip.

During the year sailing directions were published for "The West Coast of Mexico from the boundary line of the United States to Cape Corrientes, including the Gulf of California," compiled by Lieut. Samuel Belden; and a supplement to "Reported Dangers in the North Pacific," by Commander William Gibson. Only five charts were published during the year—four lithographed and one engraved—nearly the entire force having been engaged in correcting plates.

On the 14th of July, 1880, Capt. J. C. P. de Krafft was ordered to take charge of the Hydrographic Office, and on the same date he relieved Captain Franklin as Hydrographer.

*Preparations begun for issue of general charts of the South Atlantic.*

*Publications of the Office.*

*Captain de Krafft ordered as Hydrographer.*

#### FISCAL YEAR ENDING JUNE 30, 1881.

During 1881, the hydrographic work performed by our vessels on the several stations was greatly increased over preceding years. But the meagerness of the appropriation made for carrying on the work of the Office rendered it necessary to adhere mainly to the cheap process of reproducing charts by photolithography. This method, while costing less for the first issue of the charts, ultimately proved to be more expensive than that of engraving, since the engraved plates could be readily corrected, from time to time, while any extensive change in a chart produced by the former process required a new issue.

The list of vessels from which hydrographic information was received at the Office during 1881, comprises nearly all the ships that were then cruising. The Tuscarora and the Ranger, successively under Commander Philip, did important surveying work on the west coast of Mexico, and

*Reports of surveys, &c., made by naval vessels.*

*Discovery of a new anchorage to the Gulf of California.*

made extensive soundings in the Gulf of California. One of the results of the surveys and investigations made by these vessels was the discovery of a good anchorage at Agua Verde Bay, in the Gulf of California. The Jamestown, successively under Commanders Beardslee and Glass, cruising in Alaskan waters, forwarded numerous reports of investigations and surveys made along the coasts in the vicinity of Sitka.

*Discovery of a submarine volcano near the coast of Japan.*

The Alert, Commander Huntington, attached to the China Squadron, while engaged in searching for reported dangers and surveying unknown islands off the southeastern coast of Japan, discovered an active submarine volcano. The bottom of the sea, in a region where previously there had been deep water, was found to be hove up in some places to within 5 fathoms of the surface.

The Swatara, Commander Sampson, also attached to the China Squadron, forwarded surveys of a reef in the Inland sea of Japan, directions for entering the port of Vladivostock, and information concerning shoals in the harbors of Amoy and Hakodadi.

The Lackawanna, Captain Chandler, furnished important data regarding the positions of some of the Pacific islands, notably of the Marquesas and Samoan groups, as well as the results of investigations and surveys of reported dangers, and directions for entering the principal harbors of several of the islands.

The Alaska, Capt. George Brown, and afterwards under Captain Belknap, in addition to determining the geographical positions of a number of islands in the South Pacific, made a series of deep-sea soundings in the adjacent waters.

The Marion, Commander Bunce, in passing through the Straits of Magellan, collected valuable data concerning anchorages in the Straits, and other information of interest to the navigator.

The Adams, Commander Howell, forwarded the results of a survey of the port of Golfito, on the Pacific coast of Costa Rica; while the Kearsarge, Commander Picking, contributed hydrographic information concerning the Boca del Toro, on the Atlantic coast of the same country.

*Examination of recently-discovered reefs, &c.*

In the North Atlantic the Alliance, Commander Yates, made an examination of recently-discovered reefs off the Virgin Rocks, on the Newfoundland banks, and in the adjacent waters, and the Saratoga, Commander Evans, forwarded the reports of a series of deep-sea soundings. In-

formation concerning the ports of Tampico, Tuspan, and Vera Cruz, and notes on the changes that had taken place in the harbor of Pensacola, were also received from the Alliance, under Commander Yates.

The Wyoming, Commander Watson, on the European Station, collected information concerning a number of Mediterranean ports; and the Vandalia, Captain Meade, forwarded similar information in regard to numerous West India ports.

At the beginning of the year a party had been organized in the Hydrographic Office for the purpose of continuing the determination of longitudes by telegraph. This party was again placed under the command of Lieut. Commander F. M. Green, who had been for some time in charge of the Department of Longitudes of the Office.

The Palos, attached to the Asiatic Squadron, was turned over to Lieutenant-Commander Green and his party, and by the close of 1881 they had established the geographical positions of a number of prominent places on the east coast of Asia and in the East India Islands.

While all these reports had been received by the Hydrographic Office, the want of adequate funds for that purpose had limited their publication. Only a comparative few of the results of surveys were published, such as the immediate needs of the commercial world imperatively demanded, and five-sevenths of the total number of these were produced by the cheap and unsatisfactory process of photolithography. In spite of the repeated and urgent appeals of the Hydrographer, the Chief of the Bureau of Navigation, and the Secretary of the Navy, for reasonable appropriations for carrying on the work of the Office, the policy of Congress seemed to be to place the American naval and merchant marine under the humiliating necessity of depending upon the hydrographic offices of foreign powers for the means of safely navigating the oceans.

A comparison of the issues of the British and the French hydrographic offices with those of our own for this year shows that, while the British published two thousand seven hundred and fifty-five and the French three thousand one hundred and fifty-seven engraved charts, the United States sent out but two hundred and five. The results of important surveys, and the discovery of dangers to navigation, could not in justice to humanity be allowed to remain un-

*Expedition sent  
out to determine  
by telegraph the  
longitudes of  
places in the East  
Indies.*

*Want of funds  
for carrying on  
properly the work  
of the Office.*

*Comparison of  
the number of  
French and of  
English charts  
with our own.*

Important information announced; and hence such information, though first forwarded to foreign offices for publication for want of funds, was often forwarded by American vessels, and first received by the United States Hydrographic Office, was often forwarded to the hydrographic offices of foreign Governments and by them made known to the world.

**Publications of the Office.** During the year there were published sailing directions for "Kattegat Sound and the Great and Little Belts to the Baltic Sea," compiled by Commander William Gibson; for "The Coast of Brazil from French Guiana to Rio Janeiro," translated by Lieut. H. H. Gorringe, with a supplement, extending from Rio Janeiro to the Rio de la Plata, by Lieut. Seaton Schroeder; also a set of "Arctic Azimuth Tables for parallels of latitude between 70° and 88°," by Lieutenants Schroeder and R. Wainwright. Thirty-six charts were published, of which fifteen were engraved and twenty-one lithographed. Among those engraved were several of the survey in the Pacific by the officers of the *Tuscarora*.

#### FISCAL YEAR ENDING JUN 30, 1882.

**Increased demand for Hydrographic Office publications.** The growing demand for charts and other publications of the Hydrographic Office, together with the activity of our naval vessels in making surveys and forwarding the data for publication, entailed upon the Office constantly increasing labors.

**International system adopted of exchanging hydrographic information.** An international system of exchange of hydrographic information, and the energy with which foreign Governments were carrying on extended surveys and investigations, kept the Office in constant receipt of reports of discovered dangers and changes. The labor of keeping corrected to date the charts, chart-plates, sailing directions, and light-lists, and of preparing new charts, issuing Hydrographic Notices, Notices to Mariners, &c., was so great that the small force which the limited appropriation permitted to be employed proved entirely inadequate. As a consequence, results of surveys and information of the highest importance to the commercial world remained in the Office unpublished. As far as the appropriations permitted, the engraving of charts was continued; and in cases where the want of funds made this impossible, and yet the demand for the charts required their immediate issue, recourse was still had to the process of photolithography.

One of the most important surveys made by our vessels during 1882 was that of Samana Bay, by Commander Bridgman and the officers of the Despatch. Survey of Sam-  
ana Bay.

Some idea of the amount of labor involved in this survey may be obtained when it is known that within the space of three months, the officers of the Despatch measured 15,655 angles, and made 57,877 soundings extending over lines aggregating 2,603 miles in length.

Up to 1882, of the whole west coast of North and South America, from Cape Horn to the Arctic Ocean, only a single chart had been issued by the Hydrographic Office, and that chart embraced a coast line of less than 300 miles. Steps, however, had been taken at the Office in the preceding year to commence the issue of charts of the west coast of North America, and several of these were engraved and published in 1882. But the law restricting the operations of the Hydrographic Office to coasts and waters outside of the United States prevented, and at the present time (1886) still prevents, the publication of a connected series of these charts until the Coast Survey shall have completed its work on that coast.

Valuable hydrographic work was accomplished in the Arctic regions by the steamers Jeannette and Rodgers. Three new islands in the Siberian Arctic Ocean were discovered by Lieutenant Commander De Long, in the Jeannette, and now bear the name of "De Long Islands," in his honor; while Lieut. R. M. Berry, in the Rodgers, solved the problem of Wrangel Land by making a survey which proved it to be an island instead of an Arctic continent, as had been supposed. The results of this survey, and of investigations made in the Arctic Ocean on the northeast coast of Siberia, were published in the Hydrographic Office and communicated to foreign Governments. Work in Arctic regions.

The Ranger, Commander Philip, continued the survey of the west coast of Mexico, and at the close of the year had nearly completed that arduous and extensive work. Commander Philip, in the Ranger, also made a prolonged but unsuccessful search for the so-called Reed Rocks, supposed to lie in the Pacific about 700 miles west of San Francisco.

On the Asiatic Station the Alert, Commander Huntington, finished the work of surveying a number of islands, and investigating reported dangers off the southeast coast Reports of sur-  
veys, &c., made  
by naval vessels.

Reports from Asiatic Station, continued. of Japan. The geographical position of some of these reported dangers, whose latitude and longitude were doubtful, were definitely established; while the existence of others was disproved. Rear-Admiral Clitz, commanding the Asiatic Station, forwarded to the Office the results of a survey of Okosiri Island, Japan, made by the British.

The Alliance, Commander Wadleigh, transmitted valuable information on the currents, tides, winds, &c., of the coast of Iceland.

The Shenandoah, Captain Kirkland, forwarded data verifying previous surveys of the basin of the Rio de la Plata; and the Brooklyn, Captain Weaver, furnished information in regard to obstructions to navigation in the harbor of Montevideo.

Reports from European Station. From the European Station, hydrographic reports were received from the Quinnebaug, Commander Farquhar, concerning a number of ports on the east shore of the Mediterranean; from the Galena, Commander Bacheller, on Alexandria, Gibraltar, and the ports of the west coast of Morocco; and from the Trenton, flag-ship of the station, Captain Ramsay, a report of an error in the longitude of the Balearic Islands.

The Essex, Commander McCormick, discovered errors in the sailing-directions for the west coast of Africa, and forwarded data for their correction.

A survey of the Boca del Toro, on the east coast of Costa Rica, was made by officers of the Vandalia, Captain Meade, and information was also received from that vessel regarding various ports of the West Indies.

Other reports on harbors, positions of wrecks, and changes in buoys, lights, &c., in the West India Islands, on the east coast of Mexico, Central America, and on the Gulf coast of the United States were transmitted to the Office from the Kearsarge, Commander G. B. White; the Adams, Commander Merriman; and the Yantic, Commander Woodward. The Marion, while on her visit to Heard Island, to rescue the crew of the American ship Trinity, made a chart of that island, including the adjacent Macdonald group of islets. Thirty-three charts were published during the year, of which twenty-three were engraved, four heliographed, and six lithographed.

At the instance of the Hydrographer, a circular had been sent out to United States consuls in foreign countries requesting information concerning the magnetic and meteorological observations made by other countries; copies of newspapers, or publications containing notices of shipwrecks, discovered dangers, changes in channels, lighthouses, buoys, or beacons, &c., and in reply valuable data was received, through the State Department, from a number of consuls at little known places.

Circular sent out to United States consuls requesting magnetic and meteorological information.

#### FISCAL YEAR ENDING JUNE 30, 1883.

The unsatisfactory character of the charts produced by the process of photolithography, and the enormous labor entailed upon the Office by the necessity of keeping them corrected by alterations made by hand on each chart, caused the Hydrographer to decide to abandon that process as soon as possible. The matter was laid before Congress, and in August, 1882, an act was passed appropriating \$15,000 to begin the transfer of photolithographic charts to copper plates; also one of \$14,000 to complete the survey of the west coast of Mexico. The work of engraving was at once commenced, and by the close of the year several of the finished plates had been received at the Office.

Appropriation for the transfer of photolithographed charts to copper.

Our naval vessels cruising on the several stations, continued active in supplying hydrographic information to the Office.

The Ranger, Commander Philip, the only vessel engaged almost exclusively as a surveying ship, continued to forward the results of the survey of the west coast of Mexico.

Reports of surveys, &c., made by naval vessels.

On the Pacific Station the Lackawanna, Captain Henry Wilson, reported the non-existence of a supposed danger in the South Pacific; the Pensacola, Captain Fyffe, and the Hartford, Captain Carpenter, forwarded valuable data regarding the Straits of Magellan and the west coast of South America. The latter vessel also made a survey of Caroline Island in the South Pacific, and the Iroquois, Commander J. H. Sands, reported information concerning the coast of Ecuador.

On the European Station, the Lancaster, Captain Gheradi, communicated hydrographic matter regarding the harbor of Cadiz; the Juniata, Commandeur Harrington, forwarded information of a rock in the Red Sea; and the

Discovery of a rock in the Red Sea.

Quinnebaug, Commander Ludlow, sent a report on the Cape Verde Islands, and also information concerning the west coast of Africa.

Line of sound-  
ing from the  
Capes of the  
Chesapeake to  
the Indian Ocean.

On the Asiatic Station, the Ashuelot reported the erection of a light on Volcano Islands, off the coast of China; and the Enterprise, Commander Barker, *en route* to that station, made a series of deep-sea soundings in the North Atlantic, South Atlantic, and Indian Oceans, and in the Mozambique Channel, together with observations for dip and magnetic variation.

Report of sur-  
veys, &c

On the North Atlantic Station, the Vandalia, Captain Wallace, furnished information on the West Indies and on the anchorage in Beaufort River, South Carolina; the Alliance, Commander A. V. Reed, transmitted hydrographic matter concerning ports of the West Indies, and the results of a survey of Paunco River, in Mexico; the Kearsarge, Commander Bridgman, communicated valuable data on the West Indies; the Yantic, Commander Wildes, examined Manor Rock, in the Gulf of Florida; the Powhatan, Capt. A. W. Johnson, surveyed a shoal off Cartagena; and the Tallapoosa, Commander A. G. Kellogg, investigated Antonio Knoll.

On the South Atlantic Station, the Brooklyn, Captain Weaver, forwarded information in regard to Santa Cruz, Patagonia, and lights of La Plata River; the Essex, Commander McCormick, furnished hydrographic data on the west coast of South America; and the Galena, Commander Bacheller, transmitted information on La Plata River, and a shoal off Colonia. The training-ship Saratoga communicated a report on the harbor of San Juan, Puerto Rico, and the Urona Passage.

Publications of  
the Office.

The publications for the year were sailing directions for "The Mediterranean Sea, comprising the Gulf of Gioja to Cape Santa Maria di Leuca, south coast of Italy, the Adriatic Sea, Ionian Islands, the coasts of Albania and Greece to Malea, with Cerigo Island, including the Gulfs of Patras and Corinth;" "The Straits of Magellan," translated by Commodore J. C. P. de Krafft, and Commander William Gibson, and a set of "Azimuth Tables for parallels of latitude between 61° N. and 61° S.," computed by Lieut. W. H. H. Southerland. Of the fifty charts published by the Office during the year, fourteen were engraved and thirty-six

heliographed. Among those engraved were six sheets of the South Pacific Ocean series.

**FISCAL YEAR ENDING JUNE 30, 1884.**

On the 30th of June, 1883, Commander J. R. Bartlett assumed control of the Office, relieving Commodore de Krafft. Commander Bartlett ordered as Hydrographer.

In the Admiralty Chart Room of the Office it had been the practice, upon the receipt of a new edition of a British chart, to correct from it, with pen and ink, all the copies of former editions stored in the room. The great number of these new editions issued annually by the British Hydrographic Office rendered the constant correction of the charts a colossal work, while the cost of making by hand the required alterations was often many times that required for the purchase direct from the British Admiralty of a copy of the new edition itself. Accordingly, soon after taking charge of the Office, the new Hydrographer determined, as a matter of economy of labor and money, to abandon the system of hand correction, except in cases where the necessary changes were small. For like reasons it was deemed desirable to restrict the reproduction of foreign charts to processes that permitted the corrections to be made on the plates, and to confine such reproductions to charts embracing waters most frequented by American vessels.

To bring the nautical information furnished by the Hydrographic Office within easier reach of ship-masters and sea-faring men in general, branch offices were established in New York, Boston, and Philadelphia; and also additional agents for the publications of the Office were appointed in several of the principal sea-ports, where previously a single agent had enjoyed a monopoly of their sale.

The Branch Hydrographic Offices were usually located in the buildings occupied by the Maritime Exchanges, and were each placed in charge of a naval officer. Ship-masters and others interested in navigation were invited to bring their charts to these branch offices for comparison and correction, and many who availed themselves of the offer discovered that the charts they were then using were full of dangerous errors. Through the branch offices merchant captains were enabled more readily to secure the latest publications of the main Office, and to obtain information upon all subjects of a nautical character.

Hand correction of charts, and of foreign charts restricted.

Establishment of Branch Hydrographic Offices.

Utility of the Branch Offices.

**Consolidation  
of Hydrographic  
Notices and No-  
tices to Mariners.**

The Hydrographic Notices and Notices to Mariners were consolidated under the name of the latter. Prior to the establishment of the branch offices many of these notices had failed to reach the persons most concerned; but they were now brought into direct contact with the commercial marine, and their value was thus greatly enhanced. The demand for them was consequently increased, while the number issued and the field over which they extended were enormously expanded by the establishment of a system of mutually exchanging such notices with every office or department of other countries in any way likely to receive hydrographic information.

**Issue of monthly Pilot Charts begun.**

On December 1 of this year the monthly issue of "Pilot Charts of the North Atlantic Ocean," was commenced.

**Information given by the pilot charts.**

These charts show graphically all information relating to navigating the North Atlantic, collated from the reports received at the main Office during the preceding month—such as the positions of all wrecks and drifting buoys; the number and locality of icebergs, waterspouts, whales, &c.; the limits of the N. E. trade winds; the prevailing winds, their force and direction; the locality of calms and their duration; the position of fishing fleets; the prevailing currents; the tracks of cyclones, and directions for avoiding their centers. Upon these data predictions for the ensuing month were based, and represented graphically upon the charts, showing the routes steamers should take in order to keep clear of fishing fleets and icebergs; the best sailing routes between New York and the Equator, also between the Equator and Europe; and a résumé of the Notices to Mariners issued during the preceding month. The latest editions of these charts give, also, testimony in regard to the use of oil to lessen the effect of very heavy and dangerous seas, with a description of the manner of employing it.

Experience has shown the issue of the Pilot Charts to have been one of the most felicitous works of the Office. Merchant captains, as they recognized the value of these charts, began to co-operate heartily in the labor of collecting and forwarding information. The demand for the charts increased enormously, and to supply the growing want for such a bulletin, corrected to the latest practicable date, it was soon found necessary to issue a weekly supplement.

Other changes and improvements were introduced in the various divisions of the Office during this year.

**Weekly supplement to the Pilot Charts issued.**

In the Division of Drafting and Engraving, where a considerable force was kept employed in correcting chart plates, the plan was adopted of "charging all information, as soon as it comes in, against each chart affected," so that each chart keeps an open account with all sources of information, as well as with the draftsmen and engravers who work upon it. "Standards for borders, titles, lettering," &c., were adopted, and "in giving out contracts to engravers they are required to make all work conform exactly to the standard, thus leaving nothing to individual tastes, which always causes undesirable variety." (Report of the Hydrographer, 1884.) The practice of making electrotype copies of the engraved copper plates, and thus preserving the plates themselves from the wear of constant use in printing, was adopted in the Office, while the costly plan of correcting the British Admiralty charts by hand was discontinued, and new editions of such charts were purchased as soon as issued. Prior to this year the Admiralty charts had been bought from dealers in London at nearly 25 per cent. increase over the Admiralty prices; but the purchases were now made direct from the duly authorized agent for the sale of Admiralty publications. The issuing list of books furnished to naval vessels was overhauled and obsolete books were replaced by new works. New and greatly improved Meteorological charts of the North Atlantic were issued, showing graphically for each month of the year, and for each section of the ocean, the winds, weather, temperature, currents, &c., that may be expected in that region by the mariner.

The practical value of the Branch Hydrographic Offices located in New York, Boston, and Philadelphia, organized in the first half of the fiscal year, was soon so apparent to ship-masters, owners, underwriters, and others interested in ocean commerce that they petitioned for similar establishments in other large cities; and, accordingly, branches were opened in San Francisco, New Orleans, and Baltimore.

The hydrographic work performed by our naval vessels during the year was of great importance. Only one vessel, however, was engaged exclusively in surveying work. This ship, the Ranger, successively under Commanders J. W. Philip and C. E. Clark, continued the survey of the west coast of Mexico and Central America, from the Gulf of Fonseca to San Juan del Sur.

Standards for  
borders, letters,  
&c., adopted.

Electrotypes  
made of the en-  
graved plates.

Change made  
in the method of  
obtaining British  
Admiralty  
charts.

New Meteorolog-  
ical charts is-  
tance.

Reports of sur-  
veys, &c., made  
by naval vessels.

**Reports of surveys, &c., made by naval vessels.** Reports, giving hydrographic or important nautical information on ports visited during the year, were received from the Brooklyn, Captain Weaver; the Richmond, Captain Skerrett; the Hartford, Captain Carpenter; the Lancaster, Captain Potter; the Shenandoah, Captain Norton; the Lackawanna, Capt. A. P. Cooke; the Vandalia, Captain Wallace; the Alliance, Commander A. V. Reed; the Wachusett, Commander Mahan; the Nipsic, Commander Seeley; the Ossipee, Commander McGlensey; the Monocacy, Commander Higginson, and afterwards under Commander Cotton; the Kearsarge, Commander Bridgman; the Essex, Commander McCormick; the Enterprise, Commander Baker; the Swatara, Commander Cooper; the Yantic, Commander Wildes; the Iroquois, Commander J. H. Sands; the Juniata, Commander Harrington; the Quinnebaug, Commander Ludlow; the Adams, Commander Coglan; the Jamestown, Commander Gridley; and the Pinta, Lieutenant Commander Caldwell.

The Coast Survey steamer Hassler, Lieutenant Commander Nichols, furnished hydrographic information concerning Alaskan waters; and the Fish Commission steamer Albatross, Lieutenant Commander Tanner, forwarded the results of deep-sea soundings, observations for currents, temperatures, specific gravity of sea-water, &c., taken in the North Atlantic.

**Publications of the Office.**

Sailing directions for "The Coasts of Newfoundland and Labrador," compiled by Lieut. W. W. Gilpatrick and Ensign John Gibson, were published during the year, together with twenty-six charts, of which four were engraved and twenty-two heliographed.

**FISCAL YEAR ENDING JUNE 30, 1885.**

The greatly increased work of the Hydrographic Office during the preceding fiscal year involved a corresponding increase of office room required by the various divisions; and, as no additional space was available in the building for

**Removal of Divisions of Plates and Printing and of Drafting and Engraving to corner of New York avenue and Seventeenth street, and their consolidation into the Division of Chart-Construction.** The State, War, and Navy Departments, a special appropriation of \$1,200 was made by Congress for the rent of a suitable office for the Division of Plates and Printing. A building was accordingly rented, situated at the corner of New York avenue and Seventeenth street, Northwest; and in July, 1885, the Divisions of Plates and Printing, and of Drafting and Engraving, were transferred to it, and soon

after combined under the name of the "Division of Chart-Construction."

This building, though the most convenient that could have been obtained at the time of its selection, has proven since to be ill-adapted for the delicate work of engraving and printing charts on account of lacking the requisite light and stability.

A number of important improvements were made in the Office during the year. A change of the compasses upon charts was effected by dividing the true compass into degrees instead of points.

A systematic plan was adopted in the construction of charts, so that, as far as practicable, all harbor-charts were made upon the same scale.

No magnetic variation charts having been published by the United States, the Hydrographic Office has been hitherto wholly dependent upon those issued by the British Admiralty. During this year an independent collection of data was begun, with the object of preparing an American series of such charts. The work of investigating and compiling a list of accurate geographical positions was commenced for use as standard reference-meridians in the construction of new charts.

Changes were made in the designations of two of the divisions of the Office, in order that their names might more clearly indicate the character of the work performed in them, viz: the "Chart Division" became the "Division of Supply" and the Admiralty Chart-Room the "Division of Issue."

The growing appreciation of the importance of the work of the Hydrographic Office to the sea-faring world was shown during the year by the constantly increasing demands for its publications. Merchant captains evinced their interest in furthering the objects of the Office by eagerly contributing hydrographic information obtained on their voyages; and, in some cases, even cabled from Europe to the Office, at their own expense, accounts of storms or wrecks encountered in crossing the Atlantic.

During the year a set of Index-charts of the world was designed and published, showing graphically the exact region embraced by each general sailing chart printed by the Hydrographic Office, as well as the "chart number" by which it is known.

*Improvement  
made in chart  
compasses.*

*Uniform scale  
adopted for har-  
bor charts.*

*Collection of  
data begun for  
United States va-  
riation charts.*

*Chart Division  
and Admiralty  
Chart-Room  
changed respect-  
ively to Division  
of Supply and Di-  
vision of Issue.*

*Increase in the  
demand for Hy-  
drographic Office  
publications.*

*Complete set of  
Index-Charts  
published.*

Improvements in the Division of Books. Much time and labor were saved by changes introduced in the Division of Books, where were kept the nautical works issued to vessels, as well as nearly a thousand volumes of books of reference. The issuing-list of books furnished to ships was revised; the books to be issued to vessels were placed upon separate shelves, and systematically arranged, and the work was begun of making a complete catalogue and abstract of the books of reference.

Previous to this year the want of proper printing facilities made it necessary to send to the Government Printing Office, for publication, all Notices to Mariners, &c., and the pressure of other public business in that office frequently caused unavoidable delays in their issue. The acquisition of a cylinder printing-press in March, 1885, greatly facilitated the work of the Hydrographic Office, and enabled the prompt issue of Notices to Mariners, and other urgent nautical information.

Purchase of a cylinder printing-press for the Office. Ship-masters were not slow in perceiving the practical value of such information, and the demand for it rapidly increased.

The Notices to Mariners were also printed on an improved quality of light paper, in order to increase their durability and lessen the expense of postage; and, to bring them into contact with a still larger circle of merchant captains,

Weekly editions of the Notices to Mariners issued and kept on file in U. S. consulates, &c. Weekly editions of the notices were kept on file in all United States Consulates and in the business houses of the principal shipping-merchants in every prominent sea-port of the world.

New and greatly improved chart-lists for each squadron were issued during the year to all cruising naval vessels, and proved to be of much utility to navigators in handling and keeping a record of the ship's charts.

Collection of data begun regarding the use of oil in heavy seas. Data regarding the use of oil to lessen the danger to vessels in heavy seas was collected, as was hydrographic information of every kind that could in any way be of service to sea-faring men.

Computations were made in the Office, and the work of engraving begun, for a set of gnomonic charts, covering the great oceans of the globe. They were designed by Mr. G. Herrle, and afford the navigator unusual facilities for finding the Great Circle course and distance between any two points. A Great Circle protractor, designed by Commander Sigsbee,

and furnishing a graphical method of solving most of the problems of navigation, was also prepared and engraved.

Investigations were made of numerous reported dangers, many of which were found to have no existence and were removed from the charts, while the geographical positions of others were discovered to be wrong.

Notwithstanding the adoption of the policy of limiting the tedious and unsatisfactory method of correcting charts by hand to charts that required but small changes, the rapid extension of the field of usefulness of the Office brought a corresponding increase in the sources from which information was obtained, so that the work of hand-correcting was still one of considerable magnitude.

Examinations and catalogues were made of original reports of surveys and other papers containing hydrographic information that had accumulated from year to year in the Office.

Catalogues  
made of original  
surveys.

The popularity of the Meteorological Charts of the North Atlantic kept the small force of officers that could be detailed for the duty constantly occupied in the labor of collecting and preparing data for their construction, while the work on those of the South Atlantic and Indian Oceans was necessarily suspended for want of sufficient force to carry it on.

The branch offices, now firmly established upon a working basis, proved reciprocally valuable both to the main Office and to the commercial world. They served as agencies for the dissemination of hydrographic matter of every kind, and became veritable bureaus of nautical information for merchant captains, ship-owners, marine insurance companies, and persons of every class engaged in ocean navigation. The officers in charge of them were brought directly in contact with sea-faring men and were thus enabled to collect and forward to the main Office a vast amount of data for the benefit of the commercial world that otherwise might not have been secured. Every vessel that entered a port was boarded by an officer from the local branch office and inquiries were made regarding the general weather the vessel had encountered on her voyage, the limits of the trade winds, location of ice, fogs, water-spouts, wrecks, drifting buoys, &c.

Merchant captains evinced their appreciation of the objects of the Office by their uniform courtesy and their willingness in all cases to furnish every assistance in their

Usefulness of  
the branch of-  
fices.

Merchant cap-  
tains show their  
appreciation of  
the work of the  
Office.

power. Many brought their meteorological instruments to the branch offices for comparison and correction, in order that their information might be more valuable to the Office in the future.

The latest additions of standard charts were kept at all the branch offices, and ship-masters availed themselves of the opportunity to make needed corrections to their own. To still further enhance their value to the commercial marine, time-balls were established at the branch offices in Philadelphia, Baltimore, New Orleans, and San Francisco, thus enabling merchant captains to rate their chronometers by an easy and accurate method.

Time-balls established at the branch offices.

Reports of surveys, &c., made by naval vessels.

Reports of surveys, soundings, investigations of supposed dangers, or information concerning other hydrographical subjects were received from the Hartford, Captain Perkins; the Wachusett, Commander Mahan; the Lackawanna, Capt. A. P. Cooke; the Shenandoah, Captain Norton; the Yantic, Commander Wildes; the Iroquois, Commander Sterling; the Nipsic, Commander Seeley; the Essex, Commander McCormick; the Powhatan, Captain Beardslee; the Ranger, Commander C. E. Clark; the Swatara, Commander Wiltze; the Alliance, Commander Lewis Clark; the Tennessee, Captain Stanton; the Alert, Commander Barclay; the Juniata, Commander Harrington; the Palos, Lieutenant-Commander Nelson; the Kearsarge, Commander Bridgman, as well as from the Fish Commission steamer Albatross, Lieutenant-Commander Tanner, and the Light-house tender Madrño.

Reports of Explorations in Alaska.

The results of extensive explorations in Northern Alaska were sent to the Office by Lieutenant Stoney, while reports of numerous dangers to navigation, and other important maritime information were forwarded by the merchant captains through the various branch offices.

Publications of the Office.

During this year there were prepared and published in the Office sailing directions for "The Caribbean Sea and Gulf of Mexico," by Lieut. W. W. Gilpatrick; "Light Lists of the East and West Coasts of North and South America, the West Indies, and Pacific Islands;" of the "North, Baltic, and White Seas, including the Coasts of Denmark, Russia, Prussia, Sweden, and Norway;" of the "British Isles, the Atlantic Coast of Europe, including France, Belgium, and Holland;" of the "Mediterranean Sea, including the Adriatic, the Black Sea, and the Sea of Azof;" of the "West, South, and East Coasts of Africa, the East India Islands, China, Japan,

Australia, Tasmania, and New Zealand;" and a pamphlet <sup>Publications of</sup> "West India Hurricanes," by Lieut. George L. Dyer. <sup>the Office—Con-</sup> Of <sup>tinued.</sup> those the fifty-four charts published thirty-two were engraved, two photolithographed, and thirty heliographed. Among those engraved were four sheets each of the China Sea, South Pacific Ocean, and Magellan Straits series, and two sheets of the North Atlantic series.

*Table showing the average number of officers on duty in the Hydrographic Office during each year.*

Year.	Average number of officers.						
1866.....	3	1871.....	6	1876.....	16	1881.....	21
1867.....	3	1872.....	9	1877.....	16	1882.....	21
1868.....	2	1873.....	11	1878.....	16	1883.....	22
1869.....	4	1874.....	15	1879.....	21	1884.....	16
1870.....	7	1875.....	14	1880.....	23	1885.....	18



# INDEX.

---

## A.

	Page.
Admiralty charts, British, change in manner of purchasing .....	57
charts-room established in Hydrographic Office .....	20
Adams, John Quincy, endeavors to found an astronomical observatory .....	10
Adams, Lieut. H. A., recommended for Superintendent of Depot of Charts and Instruments .....	9
Agents appointed for sale of Hydrographic Office publications.....	20
Alden, Commodore James, order of, reorganizing Hydrographic Office .....	21
Appropriation for establishing an astronomical observatory, failure to secure. asked for, to purchase suitable building for Hydrographic Office .....	41
made for transfer of photolithographed charts to copper plates.....	53
Astronomical instruments obtained for Depot .....	10
Autography introduced in Office .....	21

## B.

Bancroft, Hon. George, Secretary of the Navy, first volume of astronomical observations issued under authority of .....	15
Bartlett, Commander John R., translation and compilation by .....	43
ordered as Hydrographer .....	55
Belden, Lieut. Samuel, compilation by .....	47
Blunt, Messrs. E. and G. W., purchase of engraved plates from .....	19
Books, list of, kept in archive department .....	25, 26
blank, requesting hydrographic information, sent out to merchant- men .....	44
library, rules in regard to .....	28
method of keeping .....	27
obsolete, disposition to be made of .....	27
persons taking, to be responsible for .....	27
Branch, Hon. John, Secretary of the Navy, letter addressed to, advocating founding of a Depot of Charts and Instruments .....	4
Branch hydrographic offices, establishment of .....	55
in charge of naval officers .....	55
time-balls established at .....	62
usefulness of .....	55, 57, 61
usual location of .....	55
work of .....	61, 62
Bureaus established in Navy Department .....	13

	Page.
<b>C.</b>	
Catalogue made of original surveys.....	61
Chauvenet, W., appointed member of the board to estimate value of engraved plates.....	18
Cheney, Lieut. L., compilations by .....	38
Chronometers, want of care in rating, &c., prior to establishment of Depot.....	5
glaring mistake in rate of, discovered after sailing .....	5
trial of, to be made in Depot prior to their purchase.....	7
Charts, construction of, authorized by Congress.....	17
compass-stations, publication of.....	17
compass, improvements made in .....	59
comparison of number of French and of English charts with our own.....	49
engraved, first production of .....	10
engraved between 1844 and 1861, number of .....	15
engraving of, prevented by want of funds.....	37
foreign, to be reduced to meridian of Greenwich .....	56
general sailing, preparations to issue for South Atlantic.....	46
gnomonic, computations made for .....	60
index, set of, published .....	59
meteorological, issued .....	45
new issue of .....	57
pilot .....	56
uniform scale of, adopted .....	59
variation, collection of data begun .....	59
whale, collection of data for .....	14
first issue of .....	14
wind and current, first issue of .....	14
charts included under the general name of .....	14
information given by .....	14
regions covered by .....	14
number issued .....	15
collection of data discontinued .....	35
Civilian establishment increased .....	20
Congress opposes establishment of astronomical observatory .....	10
Consuls, United States, circular sent out to, requesting hydrographic information .....	53
Coast-Survey, relations with Hydrographic Office .....	45
Coghlan, Lieutenant-Commander J. B., translation by .....	36
Columbia, District of, permanent Depot to be located in .....	12
Commissioners, Board of Navy, recommend the establishment of Depot of Charts and Instruments .....	3
dissolved .....	13
recommend establishment of permanent Depot .....	11
<b>D.</b>	
Davis, Rear-Admiral C. H., becomes Superintendent of Depot.....	17
De Krafft, Capt. J. C. P., ordered as Hydrographer.....	47
Dyer, Lieut. George L., pamphlet by .....	63

	Page.
Depot of Charts and Instruments, established .....	6
attached to Bureau of Ordnance and Hydrography .....	13
civil war greatly increases duties of .....	16
Commander Gilliss becomes Superintendent f.....	16
first location of .....	6
five-inch transit instrument mounted in .....	9
instruments to be repaired in, &c .....	5
naval officer to be in charge of .....	4
new plans submitted for .....	12
new plans approved by Secretary of the Navy .....	12
permanent steps leading to establishment of .....	10
permanent, establishment of .....	11
permanent, transfer of books, charts, &c., to permanent, transfer of, to Bureau of Navigation .....	13
permanent, location of .....	13
report on interoceanic canals and railroads prepared in .....	17
removal of, to Pennsylvania avenue between Twenty-fourth and Twenty-fifth streets northwest .....	13
E.	
Electrotypes made of engraved plates .....	57
Emmons, Commodore George F., assumes charge of Office .....	21
Exchange, international system adopted .....	50
Explorations, reports of, made in Northern Alaska .....	62
F.	
Fillebrown, Commander T. S., ordered to take charge of Office .....	18
Franklin, Capt. S. R., ordered as Hydrographer .....	47
relieved as Hydrographer .....	47
G.	
Gedney, Lieut. T. R., recommended for Superintendent of Depot .....	9
Gilliss, Lieut. James M., ordered to Depot as assistant .....	9
adopts policy of encouraging American instrument-makers .....	16
becomes Superintendent of Depot .....	16
death of .....	17
ordered to prepare plans for new permanent Depot .....	12
superintends construction of permanent Depot .....	13
views of, regarding the Depot .....	12
visits Europe in interest of Depot .....	12

	Page.
Gibson, Commander William, compilations by .....	47, 50
Gibson, Ensign John, compilation by .....	58
Gilpatrick, Lieut. W. W., compilation by .....	58
Goldsborough, Lieut. L. M., advocates founding a Depot of Charts and Instruments .....	4, 5
detached from Depot .....	8
ordered to collect charts, instruments, &c., and transport them to Depot .....	6
placed in charge of Depot .....	6
proposes to reduce foreign charts to the meridian of Greenwich .....	8
Gorringe, Lieut. Commander H. H., compilations and translations by ..	36, 44, 46, 50
Gould, Dr., quotation from .....	16
Green, Lieut. Commander F. M., compilation by .....	43
 H.	
Harrison, Capt. N. B., ordered to take charge of Office .....	19
Herrle, G., gnomonic charts constructed by .....	60
House, "Old Octagon," selected for Office .....	18
Hitchcock, Passed Midshipman R. B., ordered as assistant in Depot .....	7
placed in temporary charge of Depot .....	8
Hydrographer, official title of, created .....	21
adopts the plan of issuing quarterly statements of the operations of the Office .....	46
duties and responsibilities of, defined .....	21
duties of assistant .....	24, 25, 28, 32
Hydrographic Office, established by name .....	17
departments of, and duties of each .....	21-32
interest in, displayed by the public .....	39
increasing work of .....	58
improvements in .....	57, 59, 60
objects of .....	17, 34
publications of, since its establishment by name .....	21, 32, 34-39, 43-47, 51, 52, 54, 62, 63
removal of Departments of Plates and Printing and Drafting and Engraving to building at Seventeenth street and New York avenue .....	45
relations with Coast Survey .....	45
transfer to "Old Octagon House" .....	18
transfer to new building for State, War, and Navy Departments .....	45
work-shop established in .....	19
 I.	
Instruments, astronomical, obtained for Depot .....	10
founding of depot of charts and .....	6
work-shop for repair of, established in Depot .....	19

## J.

	Page.
Jenkins, Commodore Thornton A., pamphlet by .....	20
Journal, Meteorological, prepared in Office and issued.....	36

## L.

Library to be attached to Archive Department .....	26
Librarian, duties of .....	23, 24, 25
Light-house, lists of, to be kept in Archive Department .....	26
Lisbon, Royal Observatory of, selected as initial station for determining longitude by telegraph .....	43
Lithographic press, purchase of .....	8
Longitude, Department of, established in office .....	46
Lyons, Lieut. T. A., meteorological charts constructed by .....	42

## M.

Mallory, Hon. Francis, advocates establishment of a permanent Depot .....	11
Maury, Lieut. M. F., becomes superintendent of Depot .....	13
devoted to hydrographical subjects .....	13
deserts his post of duty and the naval service .....	15
dismissed the Navy by order of the President .....	16
Meteorological charts .....	39, 45, 57
information given by .....	42
Journal .....	36
Merchantmen furnish information for charts, &c .....	14
Miller, Lieut. J. W., translations by .....	37

## N.

Navy, U. S., the words to be engraved on all instruments belonging to the naval service .....	7
Navy, Secretary of, requests names of officers then in the United States best fitted for Superintendent of Depot .....	8, 9
Notices, Hydrographic, first issue of .....	20
combination of Hydrographic Notices and Notices to Mariners under name of the latter .....	56
foreign, to be carefully examined before reissue .....	25
improvement in quality of paper used for .....	60
manner of issuing .....	24
to Mariners issued .....	20
to be indorsed, &c .....	25
weekly editions issued and kept on file in United States consulates, &c. ....	60
Nourse, Prof. J. E. ....	6, 7, 9

## O.

Observatory, astronomical, unsuccessful efforts to establish .....	10
Royal, of Lisbon, selected as initial station for determining longitudes by telegraph .....	43
Observations, Astronomical, first volume issued .....	15
Officers, table showing average number on duty in Office during each year..	63

	Page.
Oil, collection of data begun regarding the use of.....	60
pamphlet published on the use of .....	63
Ordnance and Hydrography, Bureau of, established .....	13
 P.	
Parker, Lieut. W. H., compilation by .....	36
Patterson, C. P., appointed member of board to estimate value of engraved plates .....	18
Peterman, Doctor, papers of, translated .....	32
Permanent Depot, establishment of .....	11
Photolithography, process of, introduced in Office .....	32
unsatisfactory character of the charts produced by .....	53
Pilot Charts, first issue of .....	56
information given by .....	56
weekly supplements issued .....	56
Plates purchased from the Messrs. Blunt .....	18
correction of, begun .....	19
Press, lithographic, purchase of .....	9
cylinder printing, purchase of .....	60
Protractor, Great Circle, designed and published .....	60
 R.	
Rodgers, Commodore John, president of Board of Navy Commissioners .....	4
 S.	
Sailing Directions, number of, issued to merchant vessels .....	15
Sandwich Islands, copy of survey of, received .....	47
Schroeder, Lieut. S., translations, computations, and compilations by .....	44, 46, 50
Secretary of the Navy requests names of officers then in the United States best fitted for Superintendent of Depot .....	8, 9
Simpson, Commodore E., assumes charge of the office .....	20
Surveys, catalogue made of original .....	61
naval vessels encouraged to make .....	46
of the Pacific stopped for want of funds .....	40
reports of .....	33, 35, 36, 37, 42, 44, 45, 47, 51, 52, 54, 57, 58, 62
 T.	
Time-balls established at branch offices .....	62
Totten, Lieut. George M., translations by .....	37
Transit instrument mounted in Depot .....	9
Tyler, President, selects site for Depot .....	13
 U.	
Upshur, Hon. A. P., Secretary of the Navy, indorses the recommendation of Board of Commissioners .....	11

Van Nostrand, D., appointed member of a board to estimate value of engraved plates.....	18
Vessels, how supplied with charts, &c., prior to establishment of Depot.....	3

## W.

Wainwright, Lieut. R., arctic azimuth tables computed by.....	50
War, civil, causes greatly increased work in depot .....	16
Wilkes, Lieut. Charles, recommended and ordered as Superintendent of Depot	
removes Depot to Capitol Hill .....	8, 9
sent to Europe to purchase instruments.....	9
Wyman, Capt. R. H., assumes charge of the Office.....	21
letter of, to member of Congress.....	33
letter of, to merchants and others in Philadelphia.....	39
recommends purchase of building for Office .....	34
relieved by Captain Franklin.....	44
volumes translated by.....	20















SMITHSONIAN INSTITUTION LIBRARIES



3 9088 00635 5481