DEPARTMENT OF COMMERCE AND LABOR
COAST AND GEODETIC SURVEY
O. H. TITTMANN, Superintendent

SURVEY OF OYSTER BARS

CALVERT COUNTY MARYLAND

DESCRIPTION OF BOUNDARIES AND LANDMARKS AND REPORT OF WORK OF UNITED STATES COAST AND GEODETIC SURVEY IN COOPERATION WITH UNITED STATES BUREAU OF FISHERIES AND MARYLAND SHELL FISH COMMISSION

By C. C. YATES
CHIEF OF COAST AND GEODETIC SURVEY PARTY
ASSISTANT, COAST AND GEODETIC SURVEY

WASHINGTON
GOVERNMENT PRINTING OFFICE
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LETTER OF SUBMITTAL.

DEPARTMENT OF COMMERCE AND LABOR,
COAST AND GEODETIC SURVEY,
Washington, December 21, 1909.

SIR: I have the honor to transmit herewith a report of the officer detailed from the Coast and Geodetic Survey to cooperate with the Bureau of Fisheries and the Maryland Shell Fish Commission in surveying the oyster bars of the State of Maryland, and certain technical results which are necessary for the interpretation and use of the plats of the survey made by the Government.

This work has been done under the provisions of the act of Congress entitled "An act to authorize the Secretary of Commerce and Labor to cooperate, through the Bureau of the Coast and Geodetic Survey and the Bureau of Fisheries, with the shell fish commissioners of the State of Maryland in making surveys of the natural oyster beds, bars, and rocks in the waters within the State of Maryland," approved May 26, 1906, and of the acts of Congress making appropriations for sundry civil expenses of the Government for the fiscal years ending June 30, 1907, 1908, 1909, and 1910.

Respectfully,

O. H. TITTMANN, *Superintendent.*

To Hon. CHARLES NAGEL,
Secretary of Commerce and Labor.

CERTIFICATION.

BALTIMORE, MD., *December 10, 1909.*

The following publication is certified to contain correct technical descriptions of all boundaries and landmarks established in Calvert County by the Maryland Shell Fish Commission in cooperation with the United States Coast and Geodetic Survey.

C. C. YATES,
Chief of Coast and Geodetic Survey Party,
Assistant, Coast and Geodetic Survey.

BALTIMORE, MD., *December 10, 1909.*

Examined and certified to be correct.

WALTER J. MITCHELL,
CASWELL GRAVE,
BENJAMIN K. GREEN,
Maryland Shell Fish Commission.

SWEPSON EARLE,
Hydrographic Engineer.

NOTE.—Certified copies of this publication and of the charts of the natural oyster bars of Calvert County were filed in the office of the clerk of the circuit court of Calvert County and in the office of the Board of Shell Fish Commissioners, at Annapolis, on December 14, 1909.

CONTENTS.

SURVEY OF OYSTER BARS, CALVERT COUNTY, MD.

INTRODUCTION.

PUBLICATIONS.

The preparation of publications relating to the survey of the oyster bars of Maryland has been divided between the Government and the State in accordance with the laws [a] authorizing the work and the natural division of the surveying operations [b] of the cooperating forces.

The publications prepared and issued by the Government under the direction of the Superintendent of the Coast and Geodetic Survey consist of a series of charts and a technical report for each county surveyed.[c] The charts show all legal boundaries of oyster bars within the adopted boundaries of the waters opened up for leasing with each county, and the location of all landmarks (Coast and Geodetic Survey triangulation stations) used as a foundation for the delineation of these various boundaries. The technical report gives technical and legal descriptions of all oyster-bar and other boundaries, and descriptions of all landmarks shown on the charts, and includes the report of the representative of the Coast and Geodetic Survey in charge of the work of that Service in cooperation with the Bureau of Fisheries and the Maryland Shell Fish Commission. These charts and technical reports are prepared and certified for file with the courts and the Commission, as required by the laws of the State, and contain all information necessary to make a permanent record of the work of the Commission and the Government for all future requirements of the courts, or for any resurveys that may become necessary.[d]

The publications prepared and issued by the State under the direction of the Shell Fish Commission consist of annual reports [e] of all the operations of the Commission

[a] See Appendix A for laws relating to the cooperation of the Coast and Geodetic Survey and Bureau of Fisheries with the Maryland Shell Fish Commission.

[b] See Appendix C for a summary of the particular surveying operations which constitute an "oyster survey" as now being carried on in Maryland.

[c] These charts and technical reports can be obtained by application to the Superintendent of the Coast and Geodetic Survey, at Washington, D. C. The publications ready for issue are those for Anne Arundel, Somerset, Wicomico, Worcester, and Calvert counties; those for St. Marys and Charles counties are now being prepared.

[d] The technical records and charts for each county are published separately on account of the requirements of the oyster-culture laws of the State and the practical considerations which make it desirable to have each county "opened up" for oyster culture as soon as practicable after the completion of its survey. For these reasons and the fact that these reports are each arranged for distribution and use in one county only without reference to other published records, much of the text of this publication is of necessity identical with similar previous publications for other counties.

[e] These reports can be obtained by application to the Shell Fish Commission, Annapolis, Md. They are issued annually in October, and the first and second reports are now available for distribution.

performed under the provisions of the laws of Maryland,[a] including results of biological and economic oyster investigations, methods and results of the hydrographic survey of the boundaries of oyster bars and crab bottoms, the administrative report and financial statement of the Commission, information relating to oyster culture, methods of surveying and leasing of oyster lots, and much other important matter of legal and scientific value.

These two sets of publications are planned and arranged to supplement each other without unnecessary duplication, and when combined they form a complete report of operations, methods, and results of the work of both the Government and State.[b]

COOPERATION OF THE COAST AND GEODETIC SURVEY.

The work of the Coast and Geodetic Survey, as the name of the Service indicates, includes a survey of the coasts of the United States made on a geodetic basis. This has involved the gradual construction of a great framework of interstate triangulation for use as a foundation for detail hydrographic and topographic surveys, from which there has been compiled and published a complete set of charts of the coasts of the United States, including all waters of Maryland where oysters grow. This existing triangulation, hydrography, and topography is essential as a foundation for a correct and practical survey of natural oyster bars; and it being one of the fundamental functions of the Coast and Geodetic Survey to furnish such data, the cooperation of the Coast and Geodetic Survey with the Bureau of Fisheries and the Maryland Shell Fish Commission is a practical and natural development of Government work leading to the conservation and increase of the supply of food.

COOPERATION OF THE BUREAU OF FISHERIES.

The Bureau of Fisheries has cooperated with the Coast and Geodetic Survey and the Maryland Shell Fish Commission principally as an adviser in matters relating to the biological and economic survey of oyster bars and the methods to be employed for that purpose.[c] A steam launch, rowing boat, and certain apparatus have also been furnished.

The primary function of the Bureau of Fisheries is to increase the productiveness of marine and fresh waters by such measures as may be best suited to the purpose, and the services rendered in connection with the survey of the oyster bars of Maryland are strictly in line with the fundamental law under which it acts. In certain States other than Maryland similar work has been conducted by the Bureau acting independently, the same ends being attained at greater expense to the Government.

GENERAL STATEMENT OF WORK OF COAST AND GEODETIC SURVEY.[d]

The results obtained from the work of the Coast and Geodetic Survey in cooperation with the Bureau of Fisheries and the Maryland Shell Fish Commission need very

[a] See Appendix B for an extract from the "Second Report of the Maryland Shell Fish Commission," giving a concise summary of the "Haman Oyster Culture Law."

[b] See Appendix D of this publication for "Statistics of results of combined operations of the Government and State."

[c] Hon. George M. Bowers, Commissioner of Fisheries, has detailed for this service Dr. H. F. Moore, Assistant, Bureau of Fisheries.

[d] For a detail statement of the very large amount of excellent oyster survey work of the Maryland Shell Fish Commission see the "Annual Reports of the Maryland Shell Fish Commission."

little other summary than is indicated by the published "Charts of Natural Oyster Bars" and the scheme of hydrographic projections and triangulation stations shown on the county progress maps attached to each report.

The triangulation has been carried on in accordance with the standard methods of the Coast and Geodetic Survey, making this work and that of the "Descriptions of Triangulation Stations" of permanent value, not only to the State of Maryland in the survey of her oyster bars, but also to the Government for any future work it may do in the regions covered by the oyster-survey operations.

The boundaries of the various shellfish bottoms in relation to landmarks and the adjacent topography have been shown with all the accuracy permitted by the large-scale oyster charts published especially for that purpose.

The technical and legal descriptions of the boundaries and the description of the location of landmarks have been prepared and published in such a manner as to minimize the probability of future disputes in reference to their location.

Stated another way and quoting from the report of the "Survey of Oyster Bars of Anne Arundel County:"

> The geographic positions of the permanent landmarks and signals have been determined with the usual precision of a trigonometric survey, and their locations at all points necessary to provide ample foundation for the surveying and charting operations permitted great accuracy of definition and location for the natural oyster bar and other boundaries established. At the same time, the very important element of permanency of the positions of boundaries has been secured, as the relocation of geodetic positions can always be accomplished by a competent surveyor, even though the original landmarks and monuments have been washed away, as has been the fate of hundreds of such points established by the Coast and Geodetic Survey on the shores of the Chesapeake Bay during the last sixty-five years.

In fact, when the survey of the oyster bars of Maryland is completed, it is believed that it will stand the test of time and practical use as a working foundation for whatever form the oyster legislation of the future may assume, and that the doing of the work systematically and accurately, once for all, will lead finally to the development of a great natural food resource in the form of real oyster culture which will bring ample reward for all expenditures of the "oyster survey."

REPORT OF THE WORK OF THE COAST AND GEODETIC SURVEY IN CALVERT COUNTY.

INSTRUCTIONS.

The following two letters, together with the laws[a] of the United States relating to the subject, constitute the "instructions" received by the chief of the Coast and Geodetic Survey party engaged on work in connection with the Maryland Shell Fish Commission. They are short and definite, but furnish ample authority and leeway for all legitimate development of the cooperation of the Government and the State in the survey of oyster bars. The "free hand" permitted by these orders, together with the aid and many valuable suggestions received from the officers of the Survey at Washington, have proved very beneficial to the work, and are greatly appreciated.

DEPARTMENT OF COMMERCE AND LABOR,
OFFICE OF THE SECRETARY,
Washington, June 2, 1906.

SIR: In reply to your letter of May 28, requesting me to designate officers of the Coast and Geodetic Survey and of the Bureau of Fisheries to cooperate with the State of Maryland in making survey of and locating the natural oyster beds, I have the honor to inform you that Mr. C. C. Yates will be designated to cooperate on the part of the Coast and Geodetic Survey as soon as Congress makes the provisions of the act effective by providing an appropriation for the purpose.

Respectfully,

LAWRENCE O. MURRAY, *Assistant Secretary.*

His Excellency Hon. EDWIN WARFIELD,
Governor of Maryland, Annapolis, Md.

DEPARTMENT OF COMMERCE AND LABOR,
COAST AND GEODETIC SURVEY,
Washington, July 3, 1906.

SIR: Upon the receipt of these instructions you will surrender the command, accounts, etc., of the steamer *Endeavor* to the Hydrographic Inspector. * * *

As soon as this transfer is completed you will enter upon the duties of Coast Survey representative on the Shell Fish Commission of Maryland.

You will consult the commissioners, prepare a programme of work, and submit estimates in the usual form.

You are authorized to come to Washington for consultation from time to time as may be necessary.

* * * * * * *

Very respectfully,

O. H. TITTMANN, *Superintendent.*

Capt. C. C. YATES,
U. S. C. and G. S. Steamer Endeavor, Baltimore, Md.

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[a] For these laws see Appendix A.

ORGANIZATION AND EQUIPMENT.

The personnel and occupation of the party of the Coast and Geodetic Survey have remained practically unchanged since the beginning of the "oyster survey." Besides the chief of party, it consists of the necessary triangulators, computers, draftsmen, and temporary employees required to carry on both the surveying operations in the field and the preparation for publication of oyster charts and technical records in the Office at Washington.

The equipment for the work of the party has been ample and satisfactory. The large living and office quarters furnished the Government on the Maryland Shell Fish Commission house boat *Oyster* have been very convenient for the work, besides facilitating efficient cooperation with the surveying and oyster investigation parties of the State. In addition to the accommodations on the *Oyster* the Coast and Geodetic Survey party has had the constant use of the large steam launch *Inspector* and several other boats furnished by their own Service, and the occasional use of the Bureau of Fisheries launch *Canvasback* [a] and the steamer *Governor McLane* [b] of the State fishery force.

The greater part of the equipment of instruments for the operations of both the Government and State have been furnished by the Coast and Geodetic Survey and consist of all necessary theodolites, levels, sextants, drafting instruments, hydrometers, etc., required for all field and office work.

CHRONOLOGICAL STATEMENT OF WORK.

The field work of the Coast and Geodetic Survey in Calvert County [c] dates from May 2, 1908, when the house boat *Oyster* left Baltimore for an anchorage in the Patuxent River, inside of Solomons Island. She remained in this harbor for three months, it practically being the only suitable anchorage for the work for the entire Chesapeake Bay shore of Calvert County, as well as for the lower Patuxent River. During this period there was a great amount of windy weather and consequent rough seas, which prevented work in the open bay, and in general the triangulation foundation for the oyster survey made very slow progress.

On August 4, 1908, the part of the work necessarily done from the mouth of the Patuxent River was completed, and the *Oyster* was moved about 7 miles up the river to St. Leonards Creek.

On August 18, 1908, the headquarters for the field work was again changed by moving the house boat *Oyster* 8 miles still farther up the river to an anchorage in Battle Creek, where she remained until the completion of that part of the field work which naturally included all the Patuxent River work of Charles and St. Marys counties as well as that of Calvert County, although the results are published separately.

On September 3, 1908, the house boat finally left the Patuxent River for a new anchorage in a tributary of the Potomac River, and the field work of Calvert County

[a] By courtesy of Dr. H. F. Moore, U. S. Bureau of Fisheries.

[b] By courtesy of Capt. James A. Turner, commanding.

[c] The field work of Calvert, Charles, and St. Marys counties was so intermixed in the Patuxent River that the chronological statement of work for any one of these counties necessarily includes a considerable part of the work of the other two counties.

was dropped from that date until July 27, 1909, when it was again taken up for a period of four days to add a few details of the triangulation required for the descriptions of stations.

On December 2, 1909, it was again found necessary to obtain further triangulation details for the publication of the technical report for Calvert County, and field work was carried on for that purpose from that date to December 8, 1909.

The office work connected with the "oyster survey" of Calvert County, including computations and drafting necessary for the preparation of oyster charts and technical records for publications, was continued intermittingly with the office work of other counties surveyed during same season from the beginning of field work of Calvert County to the time of the filing of the certified oyster charts and reports in the archives of the Commission and with the clerk of the circuit court of Calvert County on December 14, 1909.

STATISTICS.[a]

Landmarks and triangulation signals erected	69
Monuments planted to mark triangulation stations	67
Triangulation stations occupied for observations of horizontal angles	52
Old triangulation stations recovered	20
New triangulation stations established	58
Total old and new triangulation stations marked and described	78
Linear miles of shore line covered by triangulation (approximate)	95
Square miles covered by triangulation (approximate)	157
Hydrographic projections prepared and completed as records of oyster boundaries	8
Triangles computed	152
Geographic positions computed	59
Corners of oyster boundaries established by computation	205
Back azimuths and distances computed from corners of boundaries to triangulation stations	615
Descriptions of triangulation stations prepared for publication	78
Descriptions of oyster boundaries prepared for publication	41
"Charts of Natural Oyster Bars" prepared for publication	5
Progress map prepared for publication	1

GENERAL REMARKS.

Before ending this report the representative of the Coast and Geodetic Survey wishes to renew his statement of appreciation of the courteous assistance received from various Government and State officials and others interested in the oyster industry of Maryland, especially to the following:

To his colleague from the Department of Commerce and Labor, Dr. H. F. Moore of the Bureau of Fisheries, whose well-known scientific knowledge of all matters relating to oysters has been of great value to the work.

[a] These statistics only include field and office work directly performed by the party of the Coast and Geodetic Survey in connection with the oyster survey of Calvert County, and do not include the many thousands of soundings and examinations of the character of the bottom made by the engineers of the Commission, which are of considerable value to the Coast and Geodetic Survey as hydrographic records for future use in connection with the preparation of new editions of charts of the waters of Maryland. See Appendix D of this publication for "Statistics of results of combined operations of the Government and the State."

To Mr. Walter J. Mitchell, chairman of the Maryland Shell Fish Commission, who, by his administrative ability in carrying out the complicated requirements of the oyster laws and by his unfailing tact, has made the cooperation of the various services engaged on the work both agreeable and effective.

To Dr. Caswell Grave, secretary of the Commission, who, as editor of the Commission's annual report and Commissioner in charge of the biological and economic oyster investigations, has been brought into constant contact with the Government work and aided its operations in every way.

To Mr. Benjamin K. Green, treasurer of the Commission, who has looked after the equipment and commissary of the house boat in such a way as to add greatly to the comfort and convenience of the party of the Coast and Geodetic Survey.

To Mr. Swepson Earle, hydrographic engineer to the Commission, whose knowledge of the work from former service in the Coast and Geodetic Survey has greatly facilitated his practical use of the technical data furnished by the Government.

To Mr. Thomas H. Robinson, counsel to the Commission, for courteously furnishing valuable information relating to county boundaries.

And to the many others connected with the Commission or who as residents in the locality where the work was being carried on have greatly assisted by furnishing important information or willing services.

CHARTS AND MAPS.

CHARTS OF NATURAL OYSTER BARS.

The charts [a] of the natural oyster bars of Calvert County, published by the Coast and Geodetic Survey from results of surveys of the Government in cooperation with the Maryland Shell Fish Commission, consist of five sheets covering a portion of the waters of Chesapeake Bay and all of Patuxent River, including all oyster-producing bottoms of Calvert County. They are published on a scale of 1 part in 20,000 (approximately 3⅓ inches to a statute mile) and are constructed on polyconic projections and based on the United States standard datum of the Coast and Geodetic Survey.

These charts show all oyster bars and other boundaries established by the Commission, and are certified for the purpose of filing in the office of the clerk of the circuit court of Calvert County and in the office of the Commission at Annapolis, as required by the oyster laws of Maryland.

In addition to the oyster-bar and other boundaries, the charts show the location and name of all landmarks (U. S. Coast and Geodetic Survey triangulation stations) used in making the survey, together with the hydrography and topography [b] necessary to make the technical definitions and delineations of boundaries readily understandable both by the people engaged in the oyster industry and the general public who may become interested through leasing of barren bottoms for oyster culture.

The names of the oyster bars are those used locally, as nearly as could be ascertained by the hydrographic engineer of the Commission. When there was no local name in common use, a name was selected from one of the prominent features of the vicinity. By the use of recognized names or those that would naturally suggest certain sections of water, it is believed that much confusion will be avoided in the location on the charts of the oyster bars, especially by those not familiar with the use of maps.

The corners of the oyster bars are numbered from 1 to the total number of corners in each area under consideration. Where boundaries adjoin, making one point a corner of two or more oyster bars, these points have two or more numbers, each number corresponding to the bar in which the figure is located. The numbers of the corners correspond with the technical and legal descriptions of this publication under the heading "Boundaries of natural oyster bars."

The landmarks and oyster bars have been grouped in the "Contents" of this publication in accordance with the charts upon which they are shown. To find a particular oyster bar or landmark which is only known by name, consult the "Contents" and

[a] These charts can be obtained by application to the Superintendent of the Coast and Geodetic Survey, at Washington, D. C.

[b] Much of the detail of the inshore topography was obtained from the excellent map of Calvert County prepared and published by the Maryland Geological Survey under the direction of Dr. William Bullock Clark from surveys of the Maryland Geological Survey in cooperation with the U. S. Geological Survey.

the desired chart and general location will be indicated. To find the name of a bar or landmark which is only known by location, consult the progress map at the end of this publication for the number of the chart on which it is to be found, and then examine the known locality on the chart for the name of the bar or landmark in question.

The contours on the charts showing the depth of water at mean low tide have been taken from the hydrographic sheets of former work of the Coast and Geodetic Survey. Four curves were selected as being the most convenient for taking off from the original hydrographic sheets and the ones of greatest value to those interested in shellfish industries. The 1-fathom contour (6 feet) and the 5-fathom curve (30 feet) correspond in a general way to the inner and outer limits of all the oyster bars surveyed. The 3-fathom contour (18-feet) furnishes the curve of about the average depth of water on the oyster bars and the 10-fathom contour (60 feet) serves in a general way to indicate the outer limits of probable oyster culture.

The boundaries of the waters within the "territorial limits of the county" and the boundaries of the "waters contiguous to the county" opened up for the leasing with Calvert County are plainly indicated on the charts. A full technical description of these boundaries is given in this publication under the heading "Boundaries of county waters."

The areas in acres of the oyster bars were determined under the direction of the hydrographic engineer of the Commission by two independent planimeter measurements of the areas as delineated on the smooth projections of the Coast and Geodetic Survey. These areas are given in small figures in parentheses on the face of the chart within the boundaries of the different shellfish bottoms.

The symbols used on the charts for the different kinds of boundaries, triangulation stations, contours of depth of water, etc., require no other explanation than that given in the legend and other notes on the face of the charts.

LEASING CHARTS.

The leasing charts of Calvert County, like those for Anne Arundel, Somerset, Wicomico, and Worcester counties, have been prepared under the direction of the hydrographic engineer of the Commission. These charts are constructed on polyconic projections and are based on the United States standard datum of the Coast and Geodetic Survey. They are made on the scales of 1 part in 5,000 or 1 part in 10,000, as the needs of oyster culture may require. Anne Arundel County required 13 leasing charts; Somerset County, 12 charts; Wicomico County, 2 charts; Worcester County, 3 charts; and Calvert County 5 charts, to cover their oyster bottoms.

These charts show all the oyster bars, crab bottoms, and clam beds and other boundaries established by the Commission, and also all boundaries of oyster lots leased for the purpose of oyster culture, thus making them comprehensive and valuable records of the results of the operations of the oyster-culture laws.

The lots leased under the provision of the "old 5-acre law" are frequently of irregular shape, but the lots leased under the provision of the new oyster laws must be of rectangular shape by the terms of that act. For this latter purpose the leasing charts have been divided by parallels of latitude and meridians of longitude into small rectangles of 1 acre or 5 acres, as may be best suited to the area under consideration,

and prospective leaseholders by the rules of the Commission are compelled to select whole rectangles as far as practicable.

For reasons of the present changeable nature of the number of lots leased and the large number of charts required, the leasing charts are not likely to be published for some years, but they can be seen at any time on file at the offices of the Commission, in Annapolis.

PROJECTIONS.

The polyconic projections [a] covering Calvert County waters are 8 in number and on the scale of 1 part in 10,000. They were constructed by draftsmen of the Coast and Geodetic Survey, but the sextant positions which determine the location of the legal boundaries of the oyster bars as delineated by the Shell Fish Commission were plotted by the draftsman of the Commission.

A copy of each of these projections, with all the plotted positions of triangulation stations, shore line, sextant positions, and boundaries of oyster bars, was made under the direction of the hydrographic engineer of the Commission by pricking through with a sharp needle the intersections of the projection lines and all other points as plotted on the original sheets.

These projections (in duplicate) are the original records of all oyster-bar and other boundaries established by the Commission, one set being filed in the archives of the Coast and Geodetic Survey, at Washington, and the other set in the office of the Shell Fish Commission, at Annapolis.

PROGRESS MAPS.

The progress map to be found at the end of this publication is on a scale of 1 part in 100,000, and shows in outline the work accomplished by the U. S. Coast and Geodetic Survey in Calvert County and contiguous waters. It gives the scheme of all the charts and smooth projections constructed in connection with the survey, the location and names of all triangulation stations used as a basis for the surveying work, and the "boundaries of county waters" established by the Commission for the purpose of carrying out the laws of Maryland relating to oyster culture.

Besides indicating the amount of work done by the Coast and Geodetic Survey in connection with the work of the Shell Fish Commission, this progress map will be of special value for index purposes to engineers and others searching for the particular chart or projection covering the locality of the oyster bars or landmarks that may be under consideration.

The progress maps [b] accompanying the first and second annual reports of the Maryland Shell Fish Commission were prepared under the direction of the hydrographic engineer of the Commission. They are on the scale of 1 part in 400,000, and show the outline of the tide-water counties of Maryland, with shaded areas to indicate the waters already covered by the operations of the oyster survey.

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[a] For the scheme of these projections see the progress map at the end of this publication.

[b] These maps and reports can be obtained by application to Maryland Shell Fish Commission, Annapolis, Md.

BOUNDARIES OF THE COUNTY WATERS.[a]

WATERS WITHIN TERRITORIAL LIMITS OF COUNTY.

The laws of Maryland relating to oyster culture provide that "no person shall be permitted, by lease, assignment, or in any other manner, to acquire a greater amount of land than ten acres situated within the territorial limits of any of the counties, or one hundred acres in any other place."

The boundary line[b] between the waters "within the territorial limits" of Calvert County and the waters in "any other place," as established by the Shell Fish Commission for the purpose of carrying out the oyster laws, and delineated on the charts and the smooth projections of the Coast and Geodetic Survey, is technically described and defined as follows:

Commencing at a point defined by the intersection of the mean low-water line of the western shore of Chesapeake Bay in the vicinity of Hog Point and the boundary line between Anne Arundel and Calvert counties; thence along the mean low-water line of the Chesapeake Bay shore of Calvert County across the mouth of all inlets less than 100 yards in width, around Plum Point and Cove Point, to a point defined by latitude 38° 19′ 09″.8 and longitude 76° 25′ 21″.0 situated on Drum Point on the northern side of the entrance to Patuxent River; thence along a straight line ending at a point defined by latitude 38° 18′ 35″.9 and longitude 76° 23′ 59″.8 situated on Hog Point on the southern side of the entrance to Patuxent River, to a point defined by the intersection of this straight line and the Patuxent River channel boundary line between Calvert and St. Marys counties as laid down on "Chart No. 20, Natural Oyster Bars, Maryland;" thence up the channel of Patuxent River following the channel boundary line between Calvert and St. Marys counties and the channel boundary line between Calvert and Charles counties and the channel boundary line between Calvert and Prince Georges counties as laid down on "Charts Nos. 19 and 20, Natural Oyster Bars, Maryland;" thence continuing up the channel of Patuxent River following the channel boundary line between Calvert and Prince Georges counties to its end on the boundary line between Anne Arundel and Calvert counties.[c]

WATERS CONTIGUOUS TO COUNTY.

The oyster laws of Maryland provide that a true and accurate delineation of all natural oyster bars shall be made on copies of charts of the U. S. Coast and Geodetic Survey, "which said copies shall be filed in the office of the said Commissioners in the city of Annapolis," and "in the office of the clerks of the circuit courts for the respective counties wherein the grounds so designated may lie."

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[a] For a complete historical and legal description of the boundaries of the counties of Maryland, the valuable publication entitled "The Counties of Maryland—Their Origin, Boundaries, and Election Districts," prepared by Dr. Edward B. Mathews and published by the Maryland Geological Survey under the direction of Dr. William Bullock Clark, Superintendent, should be consulted, as the boundaries described in this publication have been established and technically defined for the purpose of carrying out the oyster laws of the State, and may or may not be correct for other purposes.

[b] See "Charts of Natural Oyster Bars," published by the Coast and Geodetic Survey, and the progress map at the end of this publication.

[c] Latitudes and longitudes based on the United States standard datum of the U. S. Coast and Geodetic Survey.

For the purpose of carrying out the latter part of this section of the law and for the purpose of establishing the limits of the oyster-culture area to be opened up for leasing with each county surveyed, it is necessary for the Shell Fish Commission to establish a boundary line between the waters contiguous to but not within the territorial limits of each county and the waters contiguous to but not within the territorial limits of adjacent counties.

This boundary line [a] has been delineated on the "Charts of Natural Oyster Bars," published by the Coast and Geodetic Survey, and is technically described and defined as follows:

Commencing at a point defined by the intersection of the mean low-water line of the western shore of Chesapeake Bay in the vicinity of Hog Point and the boundary line between Anne Arundel and Calvert counties; thence in a straight line along the Chesapeake Bay boundary between Anne Arundel and Calvert counties as laid down on "Charts Nos. 4 and 16, Natural Oyster Bars, Maryland," to a point defined by latitude 38° 42′ 33″.4 and longitude 76° 27′ 40″.0 situated about 3⅝ miles east of Hog Point; thence in a straight line along the Chesapeake Bay boundary between Calvert and Talbot counties and Calvert and Dorchester counties as laid down on "Charts Nos. 16, 17, and 18, Natural Oyster Bars, Maryland," to a point defined by latitude 38° 30′ 00″.0 and longitude 76° 25′ 30″.0 situated about 4⅜ miles east of Governors Run; thence in a straight line along the Chesapeake Bay boundary between Calvert and Dorchester counties as laid down on "Charts Nos. 17, 18, and 20, Natural Oyster Bars, Maryland," to a point defined by latitude 38° 23′ 10″.3 and longitude 76° 20′ 00″.0 situated about 2⅝ miles east of Cove Point Light; thence in a straight line along the Chesapeake Bay boundary between Calvert and Dorchester counties as laid down on "Charts Nos. 18 and 20, Natural Oyster Bars, Maryland," to a point defined by latitude 38° 19′ 37″.7 and longitude 76° 19′ 19″.0 situated about 5¼ miles southeast of Cove Point Light and about 5¼ miles east by north of Drum Point Light; thence along the Chesapeake Bay boundary between Calvert and St. Marys counties as laid down on "Chart No. 20, Natural Oyster Bars, Maryland," to a point defined by the intersection of this boundary and a straight line between a point situated on Hog Point on the southern side of the entrance to Patuxent River defined by latitude 38° 18′ 35″.9 and longitude 76° 23′ 59″.8 and a point situated on Drum Point on the northern side of the entrance to Patuxent River defined by latitude 38° 19′ 09″.8 and longitude 76° 25′ 21″.0; thence in a straight line to a point at the end defined by latitude 38° 19′ 09″.8 and longitude 76° 25′ 21″.0 situated on Drum Point on the northern side of the entrance to Patuxent River.

[a] See progress map at the end of this publication.

LANDMARKS (U. S. COAST AND GEODETIC SURVEY TRIANGULATION STATIONS).

EXPLANATION.

The oyster laws of Maryland authorizing the survey to be made by the Shell Fish Commission provide for "an accurate report of said survey, setting forth such a description of landmarks as may be necessary to enable the said board, or their successors, to find and ascertain the boundary lines of said natural oyster beds, bars, and rocks, as shown by delineation on the maps and charts." The law of the United States authorizing the cooperation of the Department of Commerce and Labor in the survey of natural oyster bars of Maryland provides for the erection of "such structures as may be necessary to mark the points of triangulation, so that the same may be used for such future work of the Coast and Geodetic Survey as the said Bureau may be hereafter required to perform in prosecuting the Government coast survey of the navigable waters of the United States located within the State of Maryland."

Under the provisions of the sections of the laws stated above, the markings and descriptions of landmarks must be sufficient for the present and future needs of both the Government and the State. With this end in view, considerable work has been expended in erecting permanent monuments at the triangulation stations and in the proper description of their location.

An effort has been made to arrange the descriptions of location and character of landmarks in a uniform and logical manner. The descriptions start with the assumption that the individual seeking a landmark has only an indefinite idea of its location. They gradually proceed from description of the general locality of a landmark to the descriptions of its immediate surroundings. This is followed by specific details of the character of the center and reference marks and a "round" of reference angles and distances which in themselves frequently contain enough information to furnish an independent and reliable location of the triangulation station.

METHOD OF DESCRIBING TRIANGULATION STATIONS.

The separate descriptions of triangulation stations should not be used without reading the following explanation of the method of describing the triangulation stations, as it contains certain details that are common to all the landmarks described in this publication and which are omitted in the separate descriptions as being needless repetitions.

Name.—The title at the top of each separate description is the name by which the landmark or triangulation station is known and designated in all work and published oyster records or oyster charts of both the Government and State. The selection of the name is usually left to the triangulator establishing the station, and it may or may not have geographic or other significance in reference to the locality.

General locality.—Under this heading is given the general locality of the landmark in reference to well-known and prominent natural or artificial features, such as the

nearest body of water, town, river, steamer wharf, well-defined point of land, church, or any other feature that is likely to remain both permanent and prominent.

This heading also covers a reference to the published chart or map which shows the location of the station most clearly. Nearly all the triangulation stations described in this publication are plainly indicated by name and a triangulation symbol on the published charts of oyster bars of Maryland. In this case they are referred to by serial number only, the words "charts of oyster bars of Maryland" being omitted to avoid needless repetition. These published oyster charts are on the large scale of 1 part in 20,000 (approximately 3⅓ inches to a statute mile) and show the location of the triangulation stations so clearly that in many cases the written descriptions will not be required to find them.

Immediate locality.—Under this heading is given the description of the "observed station" in reference to its immediate surroundings. This is supposed to include a statement of the station's estimated elevation above high water or some other well-defined level of the locality, such as a road or house; the character of the ground on which it is located, such as marsh land, sand beach, cultivated field, or meadow; estimated bearings in points of the compass and estimated distances in yards *from* (*not to*) easily recognized features, such as extreme end of point, edge of bluff, bank of creek, line of telephone poles, shore line, barn, house, fence, ditch, trees, or any other definite detail, such as being on range with the tangent of an island and a church; and so forth.

When a standard monument has been established near the station as a "reference station," this heading also covers a statement of the true bearing of the monument in degrees and minutes and its measured distance in meters, as it is the first object that is likely to catch the eye when the immediate vicinity of the desired station is reached and might be mistaken for the center mark of the "observed station" unless special attention is called to it.

The distinction between the "observed station" and "reference station" should be carefully noted by anyone making use of the description of stations for any future surveying operations.

The "observed station" is located at the particular triangulation point covered by the description of stations, and is the one whose geographic position is first computed, as it is the point which was "occupied" and "observed on" for horizontal angles. However, in spite of the primary importance of the location of the "observed station," it will be noted from the description of stations that frequently it is not marked as well as the "reference station," and in many instances has only a pine stub to indicate its position. This is the case for the reason that the necessity of intervisibility of landmarks usually made it compulsory to locate "observed stations" on edges of banks and ends of points of land, which in the tide-water section of Maryland generally means they will be washed away in a short period of years. The past experience of the Coast and Geodetic Survey in this region has shown the great need of "reference stations," if the frequent reestablishment of a new framework of triangulation is to be avoided.

The chief reason and need for the establishment of the "reference station," or secondary station, as it might be well named, is explained in the preceding paragraph, but in several instances other reasons, such as the location of the "observed station" on an unstable sand dune, in a cultivated field, in front of a residence, or other places

objectionable to the landowner, have led to establishment of "reference stations." The location of the "reference station" in relation to the "observed station" is fixed for plotting on charts or for computation of its geographic position by checked measurements of its distances and azimuth from the "observed station."[a]

Marks.—Under this heading is given a description of the character of the permanent monuments or other marks of the location of the "observed station," and of the "reference station" where one has been established.

All the marks designated in the descriptions as "the center point of triangle on standard cement monument" are exactly alike. These monuments are made of cement, sand, and gravel, and are 2 feet long and 8 inches square at top and bottom. Their tops are all marked with the same brass mold and show a center hole surrounded by a triangle, with the letters "M. S. F. C." arranged around the vertex and the letters "U. S. C. S." underneath the base of the triangle. The center hole is always in the center of the top of the monument by construction, and if this is found to have been broken off without disturbing the bottom the center of its square section can be used as the location of the station.

All the "standard cement monuments," whether used for marking the "observed station" or "reference station," have been planted upright in exactly the same manner, with their tops projecting 3 or 4 inches above the surface of the ground, unless otherwise stated.

Therefore, as the above facts in reference to the "standard cement monuments" are a constant element in all cases, the repetition of these facts in the description of stations is made needless by this one statement.

References.—Under this heading are given the "rounds" of directions and distances to all objects that might be useful in locating the stations when the surface marks can not be found. It is also contemplated that for general purposes of topography, hydrography, or location of boundaries of oyster bars these references will be sufficient in many cases to relocate the position of an "observed station" or "reference station" when both of them have been destroyed.

The first reference object given in the descriptions is always a triangulation station visible from the station being described, this, if possible, being a light-house, church spire, or other permanent and prominent point. Its direction is taken as being 0° 00′ 00″, and the directions of all other objects are measured from it as an initial point, the angles being taken in a clockwise direction (left to right).

The true bearing[b] of the initial object is always given in parenthesis alongside its name. This furnishes means for the calculation of the bearings of any of the other reference objects for the purposes of locating a station by horizontal angles or for the relocation of corner buoys of oyster-bar boundaries by the method of compass directions described in this publication under the heading of "Boundaries of oyster bars."

The distances in the last column under "References" are given in three different units, which vary according to their accuracy. The "miles" are statute miles and may

[a] Geographic coordinates (latitude and longitude) and the distance and azimuth relating to any of the "observed stations" or of the "reference stations" described in this publication can be obtained by application to the Superintendent of the Coast and Geodetic Survey, at Washington, D. C.

[b] The mean magnetic variation for Calvert County was 5° 50′ west of north in 1909 and increasing at the rate of 3′ yearly.

be considered only as rough estimates. The "yards" are more accurate, but must be looked on as results generally obtained by pacing or careful estimating. The "meters," however, are accurate to the degree indicated by their decimals and in every case have been measured with a steel tape. In the same manner the accuracy of the directions are indicated by the refinement of angular measure with which they are recorded.

DESCRIPTIONS OF TRIANGULATION STATIONS.

HOLLAND.

General locality.—Western shore of Chesapeake Bay, on south side of entrance to Herring Bay on Holland Point. (See Chart No. 16.)

Immediate locality.—Observed station is about 30 yards west of point, 5 feet back from the top of a bank 7 feet high, 12 yards north of a large blazed tree and 25 yards east of another large blazed tree. Cement monument marking reference station is 12.88 meters S 33° 52′ W of observed station.

Marks.—Observed station is a nail in a pine stub. Reference station is center point of triangle on standard cement monument.

References.—

	°	′	″		
"Fairhaven" (N 48° 13′ W)	0	00	00	------	2½ miles.
Nail in blaze on red-oak tree (2½ feet diameter)	238	49	--	------	11.17 meters.
REFERENCE STATION	262	05	00	------	12.88 meters.
Nail in blaze on red-oak tree (2½ feet diameter)	286	55	--	------	22.63 meters.

NOTE.—This station was established and described in 1906 during the survey of the oyster bars of Anne Arundel County.

HOG POINT (HOLLAND 3).

General locality.—Western shore of Chesapeake Bay, about half way between Herring Bay and Chesapeake Beach, on Hog Point, which is near the land end of boundary line between Anne Arundel and Calvert counties. (See Chart No. 16.)

Immediate locality.—Observed station is about 5 feet above high water mark on a narrow strip of solid land 25 yards by 10 yards between the edge of a large marsh and the bay shore, about 60 yards north of the point where the shore line changes direction from north and south to northeast and southwest. It is about 4 yards west of the bay shore, 4 yards east of top edge of hummock near marsh, 7 yards east of edge of marsh, 9 yards north northwest of point of a hummock, and 18 yards south by west of point of another hummock. Cement monument marking reference station of 1908 is 2.13 meters S 80° 38′ W of observed station.

Marks.—Observed station is nail in center of drain tile set in cement, with top flush with ground, the cement being roughly scribed "U. S. C. & G. S., 1907." Subsurface marks to observed station were reported in 1907 as being two hexagonal drain tiles placed one directly over the other, with top of upper 3 feet below the surface of the ground. Reference station of 1907 is marked the same as the observed station, except that only one drain tile was used as subsurface mark. Reference station of 1908 is center point of triangle on standard cement monument.

References.—

	°	′	″		
"Sharps Island Light" (S 58° 46′ E)	0	00	00	------	9⅝ miles.
Left tangent of North Chesapeake Beach wharf	58	16	--	------	¾ mile.
Flagstaff on center of Carousel roof	64	49	30	------	1⅝ miles.
Large brick chimney	75	34	30	------	2 miles.
Water tank	76	44	50	------	2 miles.
Nail in blaze in white oak (16 inches diameter)	138	40	20	------	6.32 meters.
REFERENCE STATION 1908 (cement monument)	139	23	40	------	2.13 meters.

	°	′	″		
Nail in blaze in pin oak (18 inches diameter)	190	18	20	------	7.98 meters.
Nail in blaze in pin oak (16 inches diameter)	236	14	--	------	17.65 meters.
Nail in blaze in pin oak (18 inches diameter)	250	02	20	------	21.96 meters.
REFERENCE STATION 1907 (tile)	255	18	50	------	11.13 meters.
Left tangent of woods on eastern shore of bay	299	44	50	------	9¼ miles.

NOTE.—This station is also known as "Holland 3 of 1907," but the name has been changed to "Hog Point (Holland 3)" in the oyster survey work of Calvert County, in order to avoid confusion with "Holland 1906," which is only 1 mile to the north.

BEACH.

General locality.—Western shore of Chesapeake Bay, about 1 mile south of Chesapeake Beach and ½ mile south of the first marshy slough south of Chesapeake Beach. (See Chart No. 16.)

Immediate locality.—Observed station is about 110 feet above high water and 7 yards back from the edge of the highest bluff in this vicinity. The ground falls off rapidly to the southwest and west of the station, and is covered with brush and small locust trees. A cultivated field extends to within 10 yards of the station on the northwest. Cement monument marking reference station of 1908 is 11.40 meters N 85° 05′ W of observed station.

Marks.—Observed station is a nail in center of drain tile set in cement, with top flush with ground. Subsurface marks to observed station were reported in 1907 as being two hexagonal drain tiles placed one directly over the other, with top of upper 3 feet below the surface of the ground. Reference station of 1907 is marked the same as the observed station, except that only one drain tile was used as a subsurface mark. Reference station of 1908 is center point of triangle on standard cement monument.

References.—

	°	′	″		
"Hog Point (Holland 3)" (N 2° 55′ E)	0	00	00	------	2½ miles.
Outside end of wharf at North Chesapeake Beach	0	45	--	------	2 miles.
Outside end of wharf near Chesapeake Beach	18	17	--	------	1 mile.
"Sharps Island Light"	102	46	20	------	8¾ miles.
Nail in blazed locust tree	161	08	00	------	16.85 meters.
REFERENCE STATION (cement monument, 1908)	272	00	20	------	11.40 meters.
OLD REFERENCE POINT (tile—1907)	282	13	10	------	10.25 meters.
Nail in blazed locust tree	289	58	20	------	8.47 meters.
Near gable of house	343	16			1 mile.
High View Hotel	344	57	--	------	½ mile.
Cupola at Chesapeake Beach	348	04	--	------	¾ mile.
Flagpole of "merry-go-round" at Chesapeake Beach	353	44	--	------	¾ mile.
Left corner of house at North Chesapeake Beach	358	26	--	------	2 miles.

ILL 2.

General locality.—Western shore of Chesapeake Bay about 2¼ miles south of Chesapeake Beach and 2¾ miles north of Plum Point. (See Chart No. 16.)

Immediate locality.—Observed station is about 90 feet above high water and 12 feet west of edge of bluff which rises rapidly from the south. It is in a cultivated field about 100 yards south of a fence and trees running east and west and 7 feet west of a wire fence along edge of cliff. No other permanent reference objects near station. Cement monument marking reference station is 23.84 meters S 80° 43′ W of station.

Marks.—Observed station is nail in cement in center of drain tile with top flush with ground. Subsurface marks to observed station were reported in 1907 as being two hexagonal drain tiles placed one directly over the other with top of upper 3 feet below the surface of the ground. Reference station of 1907 is marked the same as the observed station, except that only one drain tile was used as a subsurface mark. Reference station of 1908 is center point of triangle on standard cement monument.

References.—

	°	′	″	
"Sharps Island Light" (S 82° 30′ E)	0	00	00	8¼ miles.
Tangent of land to south	62	39	--	1¼ miles.
New gable of unpainted barn	104	49	--	¾ mile.
Left chimney of four-gabled house	116	36	--	1 mile.
North gable of small barn	127	15	--	½ mile.
Center chimney of white house	140	33	--	¾ mile.
REFERENCE STATION of 1908 (cement monument)	163	12	40	23.83 meters.
East gable of unpainted barn	164	10	--	⅜ mile.
Chimney on outside of old house	169	41	--	1 mile.
REFERENCE STATION of 1907 (tile)	179	51	20	16.80 meters.
South gable of house at North Beach	260	29	--	2½ miles.
Tangent of woods on Holland Point	263	36	--	4½ miles.
Tangent on north end of Poplar Island	305	59	--	10¾ miles.

PLUM 3.

General locality.—Western shore of Chesapeake Bay about 1¼ miles north by west of Plum Point wharf and about ½ mile north by west of Plum Point. (See Chart No. 16.)

Immediate locality.—Observed station is about 7 yards west of edge of first bluff north of low land above Plum Point wharf and 12 yards south of rail fence and a line of bushes and cedar trees. Cement monument marking reference station of 1908 is 14.03 meters S 81° 43′ W of observed station. No other reference objects near station.

Marks.—Observed station is center of drain tile with top flush with ground. Subsurface marks to observed station were reported in 1907 as being two hexagonal drain tiles placed one directly above the other with the top of the upper tile 3 feet below the surface of the ground. Reference station of 1907 is marked the same as the observed station except that only one drain tile was used as a subsurface mark. Reference station of 1908 is center point of triangle on standard cement monument.

References.—

	°	′	″	
"Sharps Island Light" (N 81° 31′ E)	0	00	00	7⅝ miles.
Peak of near gable of large house	10	15	--	8¼ miles.
Outer end of Plum Point wharf	78	13	--	1¼ miles.
Chimney outside of north end of house	120	22	--	1¼ miles.
Southwest peak of barn	150	27	--	¾ mile.
REFERENCE STATION 1908 (cement monument)	180	12	20	14.03 meters.
REFERENCE STATION 1907 (tile)	213	12	10	14.23 meters.
Tangent to Holland Point	273	31	--	7½ miles.
Right tangent Chesapeake Beach wharf	273	56	--	4¾ miles.
Left tangent Poplar Island	312	43	10	12½ miles.
Large lone tree Poplar Island	319	39	10	12 miles.
Left chimney of house	326	30	--	12¾ miles.
Left chimney of house	334	55	--	11 miles.
Steeple on church or house Tilghman Island	341	02	00	10 miles.

PIER.

General locality.—Western shore of Chesapeake Bay about south southeast of Plum Point on outer end of wharf at Plum Point Landing. (See Charts Nos. 16 and 17.)

Immediate locality.—Observed station is on outer part of wharf known as Plum Point Landing about 20 yards from extreme end and nearly on line with northern side of warehouse.

Marks.—Observed station is an auger hole bored in plank flooring of wharf surrounded by a triangle marked by nails.

References.—

Northeast corner of calf pen	Southeast	6.68 meters.
Northwest corner of calf pen	South southeast	4.48 meters.
Rail of fence on south edge of wharf	South	2.03 meters.
Prolongation of line of north side of warehouse	North	0.11 meter.
South rail of wharf track	North	0.92 meter.
North rail of wharf track	North	2.36 meters.
North side of wharf	North	3.39 meters.
West side of warehouse	East	8.60 meters.

SHARPS ISLAND LIGHT.

General locality.—Easterly side of Chesapeake Bay off entrance to Choptank River on a shoal about 1⅛ miles north northwest of Sharps Island. (See Chart No. 16.)

Immediate locality.—Observed station is on light-house known as "Sharps Island Light."

Marks.—Observed station is center point of black lantern on top of tower on a cylindrical caisson foundation.

Reference.—

	°	′	″	
"Parker" (S 44° 36′ W)	0	00	00	10 miles.

PEN.

General locality.—Western shore of Chesapeake Bay about half way between Plum Point and Governors Run on the outer end of Dares Wharf. (See Chart No. 17.)

Immediate locality.—Observed station is on outer part of Dares Wharf about 30 yards from the extreme end, 12 yards west of warehouse, and 1 yard north of south side of wharf.

Marks.—Observed station is auger hole in plank flooring surrounded by a triangle marked by nails.

References.—

Southwest corner of warehouse	East by south	11.10 meters.
Inside corner on angle in wharf	East by south	5.09 meters.
South edge of wharf	South	0.95 meter.
South rail of straight track at point of frog	North	2.13 meters.
South rail of curved track	North	0.90 meter.
North edge of wharf	North	4.15 meters.
Southwest corner of cattle pen	Northeast	7.12 meters.
Southeast corner of cattle pen	Northeast by north	9.63 meters.
Northwest corner of warehouse	Northeast by north	12.80 meters.

PATCH.

General locality.—Western shore of Chesapeake Bay about 1 mile south of Dares Wharf. (See Chart No. 17.)

Immediate locality.—Observed station is on a high bluff of land about 65 yards back from its edge. Station is in a cultivated field and on a high knoll and the land slopes away from it on all sides. A locust thicket stands northwest of the station and the land slopes steeply from the station to the thicket. Cement monument marking reference station is 9.07 meters N 52° 41′ W of observed station.

Marks.—Observed station is nail set in cement in tile pipe buried with top about 15 inches below the surface of the ground. Reference station is center point of triangle on standard cement monument

References.—

	°	′	″		
"Sharps Island Light" (N 50° 39′ E)	0	00	00	10	miles.
"Cove Point Light"	96	01	20	15	miles.
Tangent to Point of Rocks	98	30	--	4	miles.

	°	′	″		
East end of Governors Run wharf	112	57	--	------	1½ miles.
East end of roof of barn	155	25	--	------	1 mile.
Nail in blazed locust (old reference mark)	210	17	50	------	11.93 meters.
Nail in blazed locust (old reference mark)	226	02	50	------	12.04 meters.
REFERENCE STATION (cement monument)	256	49	10	------	9.07 meters.
East peak of large barn on hill	257	14	--	------	½ mile.
East end of Plum Point wharf	316	50	--	------	3½ miles.

PARKER.

General locality.—Western shore of Chesapeake Bay about 2 miles north of Governors Run wharf and 2½ miles south of Dares Wharf. (See Chart No. 17.)

Immediate locality.—Observed station is about 100 feet above high water, 10 yards west of edge of bluff, 50 yards north of a small stream in a deep gully, and 25 yards east of cultivated field back of a growth of locust trees. The land slopes rapidly to the small stream from a point about 10 yards south of the station. Reference station is 23.29 meters N 83° 45′ W of observed station.

Marks.—Observed station is nail in center of tile pipe filled with cement. Reference station is center point of triangle on standard cement monument.

References.—

	°	′	″		
"Cove Point Light" (S 36° 39′ E)	0	00	00	------	11 miles.
East end of Governors Run wharf	11	10	--	------	1¼ miles.
REFERENCE STATION	132	54	10	------	23.29 meters.
Nail in blazed locust	159	39	25	------	8.19 meters.
East end of Dares Wharf	223	45	--	------	3¼ miles.
"Sharps Island Light"	261	10	30	------	11 miles.
White house on Eastern Shore	327	32	--	------	10 miles.

RUN.

General locality.—Western shore of Chesapeake Bay on Governors Run wharf. (See Charts Nos. 17 and 18.)

Immediate locality.—East peak of wharf house.

Marks.—Observed station is braced pole with cage on east peak of wharf house on Governors Run wharf.

References.—None necessary.

POPLAR.

General locality.—Western shore of Chesapeake Bay about 2 miles south of Governors Run wharf (See Chart No. 18.)

Immediate locality.—Observed station is in a cultivated field about 60 feet above high water, 50 feet west from edge of bluff, 25 yards south of a ravine which starts at shore, 115 yards north of where high cliff covered with trees commences to rise rapidly, and 30 yards from a large poplar tree on opposite side of a ravine with sycamore, cherry, and locust trees along its edge. Another bluff rises rapidly on opposite side of ravine.

Marks.—Observed station is center point of triangle on standard cement monument with a subsurface mark of a nail in a short stub.

References.—

	°	′	″		
"Sharps Island Light" (N 27° 41′ E)	0	00	00	------	12 miles.
Tangent of James Point woods	18	28	--	------	8 miles.
White house on Eastern Shore	65	00	--	------	8 miles.
Chimney on house	198	25	--	------	1 mile.
East peak of barn	203	37	--	------	1¼ miles.
East end of Governors Run wharf	309	18	--	------	1½ miles.
Chimney on white house above "Parker"	310	45	--	------	2½ miles.
South peak of barn	311	47	--	------	2¾ miles.
Peak of unpainted barn	317	23	--	-----	3 miles.

	°	′	″	
East end of Dares Wharf	320	43	--	4 miles.
East end of Plum Point wharf	324	57	--	8 miles.
Tangent of Plum Point	325	04	--	9 miles.

FLAG POND.

General locality.—Western shore of Chesapeake Bay, 3¾ miles north-northwest of Point of Rocks and 4 miles southeast of Governors Run. (See Chart No. 18.)

Immediate locality.—Observed station is on sand and grass land between bay shore and swamp about 5 feet above high water, 35 yards south of shore, 20 yards northwest of shore, 9 yards northwest of cedars between shore and station, 10 yards west of cedars and bushes, 25 yards west of shore, and 10 yards northeast of swamp. Cement monument marking reference station is 9.02 meters N 87° 33′ W of observed station.

Marks.—Observed station is a spike in cement in a stovepipe 4 inches in diameter and 1 foot long placed on top of a cement post 6 inches square with a ¼-inch galvanized iron rod core. Reference station is center point of triangle on standard cement monument.

References.—

	°	′	″	
"Cove Point Light" (S 41° 57′ E)	0	00	00	6¼ miles.
Spike in blaze	10	48	40	13.56 meters.
Spike in blaze in cedar tree	131	36	40	14.88 meters.
REFERENCE STATION	134	23	30	9.02 meters.
Spike in blaze in cedar tree	162	27	--	18.48 meters.
Spike in blaze in cedar tree	269	43	50	8.80 meters.
Right edge of main woods	282	19	50	7¼ miles.
Left peak of house	302	07	50	7¼ miles.
Left peak of house with two dormer windows	318	18	--	8½ miles.

WILSON 2.

General locality.—Western shore of Chesapeake Bay, about 5 miles northwest of "Cove Point Light." (See Chart No. 18.)

Immediate locality.—Observed station is on a sand bluff about 80 feet above high water, 30 yards south from one edge of bank, 15 yards southwest of another edge of bank, 20 yards northwest from point where decline begins toward southeast, 3 yards south of cultivated land, about ¼ mile north-northeast of house with two large chimneys on each end, and about ½ mile northeast of a barn. Cement monument marking reference station is 1.56 meters N 88° 28′ E of observed station.

Marks.—Observed station is a ¼-inch galvanized wire set in center of cement post about 6 inches square with top about 6 inches below surface of ground. Reference station is center point of triangle on standard cement monument with top 6 inches above ground.

References.—

	°	′	″	
"Sharps Island Light" (N 14° 54′ E)	0	00	00	14 miles.
Left of main woods	18	23	--	15¼ miles.
REFERENCE STATION	73	34	20	1.56 meters.
Left peak of house	84	40	40	8 miles.
Near corner of near chimney of Wilson house	191	02	--	¼ mile.
Peak of barn	225	25	--	½ mile.

POINT OF ROCKS.

General locality.—Western shore of Chesapeake Bay, on Point of Rocks, about 2¾ miles northwest of Cove Point Light. (See Chart No. 18.)

Immediate locality.—Observed station is in dense woods on a bluff about 90 feet high, 5 yards west of edge at extreme point, 8 yards south of edge of bluff, and 5 yards northwest of edge of bluff. Cement monument marking reference station is 9.42 meters S 66° 44′ W of observed station.

Marks.—Observed station is nail in center of round stake 4 inches in diameter with top flush with ground driven into a 6-inch drain tile with top 6 inches below the surface. Subsurface mark was reported in 1898 as a 6-inch drain tile set just below upper tile. Reference station is center point of triangle on standard cement monument with top 4 inches above surface of ground.

References.—

	°	′	″		
"Cove Point Light" (S 43° 26′ E)	0	00	00	------	2¾ miles.
Center nail in blaze of tree (13 inches diameter)	19	19	40	------	5.64 meters.
Center nail in blaze of tree (13 inches diameter)	90	05	30	------	5.62 meters.
REFERENCE STATION	110	09	30	------	9.42 meters.
Nail in blaze in tree (9 inches diameter)	126	35	40	------	4.16 meters.
Right tangent Governors Run Wharf	186	20	20	------	7½ miles.
Tangent of main woods	249	57	--	------	8½ miles.
Left peak of large house	297	45	20	------	6 miles.
Northerly peak of large house	312	17	30	------	6¾ miles.

COVE POINT LIGHT.

General locality.—Western shore of Chesapeake Bay on Cove Point, which is about 5 miles to northward of entrance to Patuxent River. (See Charts Nos. 18 and 20.)

Immediate locality.—Observed station is on white tower known as "Cove Point Light" which is near white detached dwelling and white detached fog signal house.

Marks.—Observed station is center point of black lantern on white tower.

References.—

	°	′	″		
"Cedar Point Light" (S 7° 16′ E)	0	00	00	------	6 miles.

WHITE HOUSE (N. E. CHIMNEY).

General locality.—Western shore of Chesapeake Bay about 1 mile southwest of Cove Point Light and ¼ mile southwest of Cove Point Landing. (See Charts Nos. 18 and 20.)

Immediate locality.—Observed station is a chimney standing alone about 300 yards southwest of Cove Point Landing which was formerly the more northeasterly of two chimneys on a house that was destroyed by fire. This chimney is near a white house which was built to replace the destroyed house.

Marks.—A chimney standing apart from a small white house owned by Mrs. Hagland.

References.—

	°	′	″		
"Cove Point Light" (N 39° 54′ E)	0	00	00	------	1 mile.

TRAVERS 2.

General locality.—Eastern shore of Chesapeake Bay on western side of Taylors Island about 4 miles south of James Point. (See Chart No. 18.)

Immediate locality.—Observed station is about 4 feet above high water mark in a field which was once under cultivation but is now covered with water bushes, about 40 yards east of shore and 15 feet north of a wire fence which starts at the shore and runs east. A stone used as an old reference mark stands 9.41 meters N 26° 53′ E of observed station and the cement monument marking new reference station is 9.52 meters N 77° 20′ W of observed station.

Marks.—Observed station is a granite post projecting above the ground with cross lines running approximately north to south and east to west. New reference station is center point of triangle on standard cement monument. Old reference station is a cross on a granite post projecting above the ground with one of the cross lines running in the direction of Cove Point Light.

References.—	°	′	″		
"Cove Point Light" (S 26° 15′ W)	0	00	00	------	6½ miles.
Governors Run Wharf	77	12	--	------	9½ miles.
Tangent of woods at waters edge	123	40	--	------	½ mile.
Near peak of two-story house	173	23	--	------	¼ mile.
OLD REFERENCE STONE (granite post)	180	38	20	------	9.41 meters.
Chimney of 1½ story house	195	47	--	------	¼ mile.
NEW REFERENCE STATION (cement monument)	256	24	50	------	9.52 meters.
Near corner of small cabin	271	32	--	------	¼ mile.
Near chimney of house among trees	300	54	--	------	½ mile.
Near peak of small house	304	54	--	------	¾ mile.

PRINCE.

General locality.—Western shore of Patuxent River about ¼ mile north of mouth of Swanson Creek. (See Chart No. 19.)

Immediate locality.—Observed station is in pasture about 20 feet above high water, 15 yards northwest of edge of bank, 75 yards northeast of a grove of trees and 100 yards southwest of another grove of trees. Locust trees form a fringe along edge of bank.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—	°	′	″		
"Leitch" (S 83° 01′ E)	0	00	00	------	¾ mile.
Square chimney on house	0	02	--	------	¾ mile.
Chimney on store at Buena Vista	19	15	--	------	1¾ miles.
Chimney of Dr. Huggins house at Buena Vista	21	07	--	------	1¾ miles.
Nearest chimney on Gourley house on Hallowing Point	55	16	--	------	2½ miles.
Nail in blaze in locust tree (3 inches diameter)	79	38	30	------	15.94 meters.
Nail in blaze in locust tree (4 inches diameter)	110	13	30	------	14.55 meters.
Outside chimney on large house on hill	150	45	--	------	¾ mile.
Near end of peak of roof	226	02	--	------	¾ mile.
Middle of clump of trees	273	00	--	------	100 yards.
Chimney of house	311	04	--	------	1¾ miles.
Nail in blaze in crotch of locust tree (6 inches diameter)	350	39	10	------	19.27 meters.

LEITCH.

General locality.—Eastern shore of Patuxent River on prominent point opposite mouth of Swanson Creek given on chart as Gods Grace Point but known locally as Leitchs Point. (See Chart No. 19.)

Immediate locality.—Observed station is on sand and grass land about 1 foot above high water and 3 yards north of straight line connecting two round points. It is about 13 yards northwest of the lower of these two points and 9 yards east of upper point. A creek 3 feet wide has its mouth about 19 yards east by south of the station. There are no permanent objects near station.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—	°	′	″		
"Prince" (N 83° 00′ W)	0	00	00	-----	¾ mile.
Near end of corner peak of roof of large house on hill	25	02	--	-----	1¾ miles.
Near end of peak of wharf-house roof	77	46	--	-----	¼ mile.
Right chimney of house	183	32	--	-----	⅛ mile.

	°	′	″	
Right chimney of Gourley house	253	58	--	2 miles.
Canning-house stack	277	22	00	2 miles.
"Catholic Church Cross"	281	35	30	2 miles.
Chimney of small house	308	52	--	1 mile.
Right outside chimney of old house	328	43	--	1¼ miles.
Right outside chimney of old house	343	05	--	1½ miles.

FODDER.

General locality.—Western shore of Patuxent River on the southern side of the mouth of Swanson Creek about 1 mile west-southwest of Leitch Wharf and ¾ mile west-northwest of Point Judith (locally known as Teague Point). (See Chart No. 19.)

Immediate locality.—Observed station is on the edge of cultivated land about 10 feet above high-water mark, 4 yards west of edge of bank, and 9 yards north of another edge. Cement monument marking reference station is 15.21 meters S 60° 52′ W of observed station.

Marks.—Observed station is center point of triangle on standard cement monument with a top 9 inches square and 8 inches above surface of ground. Reference station is center point of triangle on standard cement monument with a top about 8 inches square and 5 inches above surface of ground.

References.—

	°	′	″	
"Prince" (N 25° 00′ E)	0	00	00	½ mile.
Near peak of large house on bluff	17	55	--	2 miles.
Right corner of house	24	08	--	1¾ miles.
Near peak of Leitch Wharf house	35	11	--	1¼ miles.
Left peak of Leitch house	48	37	--	1¼ miles.
Front peak of house at Buena Vista	75	00	--	1¼ miles.
Chimney outside left end of house on hill	87	16	--	2 miles.
Near peak of small house	101	33	--	⅜ mile.
Large chimney on small house	174	43	--	1 mile.
Left side of left chimney outside Bowling house	211	47	--	¾ mile.
REFERENCE STATION	215	52	30	15.21 meters.
Left corner of house on top of hill	318	27	--	1 mile.

BUENA.

General locality.—Eastern shore of Patuxent River about 1¾ miles northeast of Benedict at place known as Buena Vista. (See Chart No. 19.)

Immediate locality.—Observed station is in a field on land adjoining house owned by S. V. Smith and occupied by Doctor Huggins. It is about 10 feet above high water, 8 yards east of edge of bank, and 12 yards south of a rail fence. Cement monument marking reference station is 11.11 meters N 5° 42′ E of observed station and near fence.

Marks.—Observed station is nail in stub with top 2 inches above ground. Reference station is center point of triangle on standard cement monument.

References —

	°	′	″	
"Hallowing" (S 27° 22′ W)	0	00	00	1½ miles.
Center of red roof on square house near Benedict	18	05	--	2 miles
Canning-house stack	21	30	--	1¾ miles.
"Catholic Church Cross"	29	04	10	1¾ miles.
Nail in blaze in locust tree (4 inches diameter)	31	48	40	8.58 meters.
Left chimney of old house	66	15	--	3 miles.
Left chimney of old house	72	52	--	3 miles.

	°	′	″		
Nail in blaze on cherry tree (2 inches diameter)	99	05	--	------	9.70 meters.
Peak of roof of large house	99	15	--	------	4 miles.
Chimney of house near Leitch Wharf	108	52	--	------	1 mile.
Nail in blaze on fence post	143	33	50	------	11.18 meters.
REFERENCE STATION	158	20	20	------	11.11 meters.
Near corner of house	159	44	--	------	25 yards.
Cherry tree on fence line (15 inches diameter)	221	25	--	------	35 yards.
Double apple tree (30 inches diameter)	290	54	--	------	59 yards.

TEAGUE.

General locality.—Western shore of Patuxent River on point on southern side of entrance to Swanson Creek, locally known as Teague Point, and given on chart as Point Judith. (See Chart No. 19.)

Immediate locality.—Observed station is on gravel and grass land about 3 feet above high water, about 11 yards from south side, 16 yards from north-northeast side, and 75 yards west by north of extreme end of point. Bushes stand between station and north side of point. There are no permanent reference objects near station.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—

	°	′	″		
"Buena" (N 85° 24′ E)	0	00	00	------	1½ miles.
Tangent of Teague Point	20	00	--	------	75 yards.
Near corner of right chimney of Gourley house near Hallowing Point	65	45	--	------	1¼ miles.
Canning-house stack	106	18	00	------	1¼ miles.
Near end of peak of hotel	108	12	--	------	1¼ miles.
Left one of two ivy-covered chimneys	110	25	--	------	1 mile.
"Catholic Church Cross"	114	11	10	------	1 mile.
Chimney on Slye House	130	30	--	------	2 miles.
Left chimney of house on hill	144	57	--	------	2 miles.
Tangent of high-water mark	168	00	--	------	75 yards.
Near end of peak of roof	223	41	--	------	1 mile.
Chimney on large house on hill	243	20	--	------	3 miles.
Left chimney on house	301	17	--	------	1 mile.
Near end of peak of roof on store at Buena Vista	355	59	--	------	1¼ miles.

CITY.

General locality.—Western shore of Patuxent River on Town Point about ¼ mile north-northeast of Benedict steamboat wharf. (See Chart No. 19.)

Immediate locality.—Observed station is on gravel and shell point about 4 feet above high water, 12 yards northwest of the shore, 63 yards west-southwest of a shanty, about 100 yards west-southwest of extreme end of point, and 11 yards southeast of a slough. There are no permanent reference objects near station.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—

	°	′	″		
"Hallowing" (S 51° 21′ E)	0	00	00	------	½ mile.
Windmill near Sheridan Point	21	39	00	------	3½ miles.
Two middle chimneys at Dowells	21	39	00	------	3½ miles.
Left tangent of peak of wharf-house roof	81	34	--	------	¼ mile.
Center of roof of square house	84	36	20	------	½ mile.
Canning-house stack	95	22	00	------	¼ mile.
Nearest ivy-covered chimney of old house	130	14	--	------	⅛ mile.
"Catholic Church Cross"	142	58	50	------	¼ mile.

	°	′	″		
Left square chimney of house	245	42	--	------	1¾ miles.
Near end of peak of roof of Huggins house	280	54	--	------	1½ miles.
Near corner of shanty	300	44	--	------	63 yards.
Right chimney of Gourley house	339	20	--	------	¾ mile.
Chimney of old building behind wharf	352	01	--	------	¾ mile

HALLOWING.

General locality.—Eastern shore of Patuxent River on point opposite Benedict known locally as Holland Point, but given on charts as Hallowing Point. (See Chart No. 19.)

Immediate locality.—Observed station is on a rounded gravel and grass point about 250 yards south of wharf on Holland Point, about 2 feet above high water, 10 yards north of shore, 8 yards east of shore and 15 yards outside of a group of locust trees, sugar-berry trees, and bushes.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—	°	′	″		
"City" (N 51° 21′ W)	0	00	00	------	¾ mile.
Left end of peak of roof of wharf house on Holland Point	23	15	--	------	250 yards.
Chimney of store at Buena Vista	77	27	--	------	1¾ miles.
Nail in blaze in nearest one of group of four sugar-berry trees (each 8 inches diameter)	92	24	--	------	12.88 meters.
Nail in blaze in sugar-berry tree (10 inches diameter)	109	58	50	------	15.74 meters.
Nail in blaze in locust tree (4 inches diameter)	167	55	40	------	11.90 meters.
Smokepipe on Trent Hall Wharf building	227	35	--	------	2¼ miles.
Outside chimney of detached house at Sothorons	309	54	--	------	1½ miles.
Center of roof on square house	314	15	--	------	¾ mile.
Canning-house stack	333	16	--	------	½ mile.
"Catholic Church Cross"	347	44	20	------	¾ mile.

INDIAN.

General locality.—Western shore of Patuxent River on north side of entrance to Indian Creek and about one-fourth mile below Benedict steamboat wharf. (See Chart No. 19.)

Immediate locality.—Observed station is about 3 feet above high water, 7 yards west of shore, 16 yards northeast of a fence and a line of trees, 13 yards southwest of a lone locust tree, about 250 yards to the south-southeast of a large square house, and 125 yards east-northeast of another house.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—	°	′	″		
"Sothoron" (S 23° 11′ E)	0	00	00	------	1 mile.
Nail in blaze in locust tree near fence (5 inches diameter)	33	48	50	------	15.57 meters.
Nail in blaze in middle branch of locust tree (6 inches diameter)	66	24	50	------	19.13 meters.
Square chimney on old house	137	23	--	------	1¼ miles.
Right chimney of square house	188	30	--	------	⅛ mile.
Near end of peak of roof of hotel	206	26	--	------	¼ mile.
Canning-house stack	213	22	10	------	¼ mile.
Right tangent of Benedict Wharf	228	10	--	------	½ mile.
Chimney of house near "Buena Vista"	245	58	--	------	2¼ miles.
Chimney of Gourley house	270	28	--	------	1 mile.
Windmill at Dowell's on Sheridan Point	344	48	--	------	4¼ miles
Left of right chimney on Dowell house	344	48	--	------	4¼ miles.
Nail in blaze in left branch of locust tree (5 inches diameter)	225	28	--	------	12.90 meters.

DWARF.

General locality.—Eastern shore of Patuxent River about 2 miles north-northwest of Sheridan Point and about 1½ miles southeast of Benedict on a point of land opposite the mouth of Indian Creek. (See Chart No. 19.)

Immediate locality.—Observed station is on sand and grass land about 1 foot above high-water mark, 6 yards northeast from extreme end of point, 4 yards east of one edge of shore and 6 yards north of another edge of shore. Point on which station is located has a sugar-berry tree, several small locust trees and water bushes, and a pond behind bushes and trees about 100 yards to the east.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—

	°	′	″		
"Sothoron" (S 42° 05′ W)	0	00	00	------	¾ mile.
Nearest corner of top of nearest chimney on tenant house	80	31	--	------	2 miles.
Center of roof of square house	83	16	--	------	1 mile.
Nail in blaze in locust tree (4 inches diameter)	93	38	30	------	4.22 meters.
Canning-house stack	95	03	33	------	1¾ miles.
"Catholic Church Cross"	99	03	10	------	1¾ miles.
Left tangent of wharf	124	19	--	------	¾ mile.
Nail in sugar-berry tree (10 inches diameter)	152	38	30	------	8.94 meters.
Nail in blaze in locust tree (3 inches diameter)	196	22	20	------	2.68 meters.
Chimney on small house	258	48	--	------	2 miles.
Left point of peak of roof of Dowell's	287	30	--	------	2¼ miles.
Left end of peak of roof of Trent Hall Wharf	315	35	--	------	1½ miles.
Middle cupola on stable	321	12	20	------	1½ miles.
Right pillar on Sothoron house porch	359	21	--	------	1 mile.

SOTHORON.

General locality.—Western shore of Patuxent River on Long Point between entrances to Indian and Trent Hall creeks. (See Chart No. 19.)

Immediate locality.—Observed station is on sand and grass lowland about 1 foot above high-water mark among cedar trees, about 24 yards west by north of extreme end of point, 12 yards north of one edge of shore and 30 yards southwest of another edge of shore.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—

	°	′	″		
"Hallowing" (N 13° 51′ E)	0	00	00	------	1¼ miles.
Nearest chimney on Gourley house	3	55	--	------	1¼ miles.
Nail in blaze in locust tree (4 inches diameter)	30	49	--	------	3.35 meters.
Left end of peak of roof of Dowell house	120	35	--	------	2¼ miles.
Middle cupola on Trent Hall stable	150	25	00	------	1¼ miles.
Point of middle attic window on John Bullinger house	187	42	--	------	1 mile.
Left pillar of porch of Sothoron house	206	23	--	------	½ mile.
Nail in blaze in cedar tree (12 inches diameter)	242	51	50	------	8.12 meters
Near corner of nearest chimney on Slye house	291	05	20	------	2 miles.
Nail in blaze in locust tree (4 inches diameter)	302	29	40	------	10.83 meters.
Right one of two outside chimneys on old house on hill on property of A. B. Slye	307	31	20	------	2 miles.
Center of roof on square house	323	39	10	------	1 mile.
Nail in blaze in locust tree (6 inches diameter)	350	24	10	------	12.81 meters.

BUZZ.

General locality.—Northeast shore of Patuxent River on southwest side of Buzzards Island near mouth of Buzzards Island Creek. (See Chart No. 19.)

Immediate locality.—Observed station is on marsh, clay, and grass land on wooded island about 2 feet above high water, 5 yards northeast of river shore and 40 yards northwest of extreme point of island. Cement monument marking reference station is 8.97 meters N 42° 23′ E of observed station.

Marks.—Observed station is nail in stub with top flush with ground. Reference station is center point of triangle on standard cement monument.

References.—	°	′	″		
"Morsel" (S 25° 23′ E)	0	00	00	------	¾ mile.
Smoke pipe on roof of storehouse	39	11	--	------	2 miles.
Near corner of near chimney	40	36	--	------	2 miles.
Chimney of Trent Hall	50	48	--	------	1¼ miles.
Nearest of three cupolas on stable	54	36	50	------	1¼ mile.
Left piazza post at Sothorons	102	41	--	------	1¼ miles.
Center of roof of square house	155	15	--	------	1¾ miles.
"Catholic Church Cross"	164	56	--	------	2 miles.
Nail in blaze in oak tree (18 inches diameter)	172	14	--	------	4.55 meters.
Nail in blaze in oak tree (18 inches diameter)	198	36	40	------	13.16 meters.
Nail in blaze in oak tree (24 inches diameter)	235	08	30	------	9.62 meters.
REFERENCE STATION	252	45	45	------	8.97 meters.
Nail in blaze in pine tree (5 inches diameter)	255	43	--	------	6.52 meters.
Chimney on house across creek	313	23	--	------	¼ mile.

BILLIARD.

General locality.—Southwest shore of Patuxent River about ¼ mile southeast of entrance to Trent Hall Creek. (See Chart No. 19.)

Immediate locality.—Observed station is on marsh land about 1 foot above high-water mark, 6 yards west of shore, 70 yards north of curve in shore and about 100 to 150 yards north to northwest of a fence which runs to water's edge. No permanent reference objects near station.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—	°	′	″		
"Trent" (S 32° 53′ E)	0	00	00	------	⅜ mile.
Middle cupola on Trent Hall stable	16	36	--	------	½ mile.
Chimney on Trent Hall	18	41	--	------	½ mile.
Two trees	31	47	--	------	200 yards.
Tangent of curve in water line	33	00	--	------	71 yards.
Chimney of 2½-story house	81	59	--	------	2 miles.
Right corner of Sothoron house	162	34	--	------	½ mile.
Near corner of chimney on Slye house	171	09	--	------	2 miles.
Right tangent of wharf	213	11	--	------	2 miles.
Middle of three chimneys on Gourley house	228	53	--	------	2 miles.
Chimney on house among trees	293	41	--	------	1½ miles.
Nearest end of peak roof of Dowell house at Dukes Wharf	333	42	--	------	1¾ miles.
Right tangent of Sheridan Point	341	34	--	------	1½ miles.
Left tangent Trent Hall Wharf	348	49	--	------	⅜ mile.
Smoke pipe on house at land end of Trent Hall Wharf	356	53	--	------	⅜ mile.

MORSEL.

General locality.—Northeast shore of Patuxent River about 1 mile north by west of Sheridan Point. (See Chart No. 19.)

Immediate locality.—Observed station is in a wheat field on a cliff about 60 feet above high water, about 5 yards northeast of edge of bank, 110 yards north northwest of rail fence at woods, 103 yards west southwest of woods, and 167 yards west northwest of corner of field at creek and woods. Trees grow out of face of cliff below station.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—	°	′	″	
"Sheridan" (S 5° 27′ E)	0	00	00	⅞ mile.
Near corner of near chimney on brick end of Dowell house	37	12	--	2 miles.
Chimney beyond weeping willow at Trent Hall	62	58	--	1 mile.
Nearest chimney on Slye house	128	11	--	3 miles.
"Catholic Church Cross"	148	44	00	2¾ miles.
Chimney on house with tin roof ell	172	17	--	1 mile.
Oak tree near creek (4 feet diameter)	297	27	--	167 yards.
Large white-oak tree	330	50	--	110 yards.

TRENT.

General locality.—Southwest shore of Patuxent River on White Point about 50 yards west of Trent Hall Wharf. (See Chart No. 19.)

Immediate locality.—Observed station is 1 foot above high-water mark on sand and grass land between river and marsh, about 47 yards west of small house on land end of Trent Hall Wharf, about 64 yards northwest of extreme end of White Point, 5 yards southwest of high-water mark, about 428 yards north of Trent Hall and 105 yards south by east of mouth of creek. Cement monument marking reference station is 17.18 meters S 69° 40′ W of observed station.

Marks.—Observed station is nail in stub flush with ground. Reference station is center point of triangle on standard cement monument.

References.—	°	′	″	
"Sheridan" (S 57° 31′ E)	0	00	00	1⅛ miles.
Tangent of point	32	17	--	½ mile.
Large lone tree	50	15	--	½ mile.
Right corner of Trent Hall	74	08	--	428 yards.
Right cupola of three on Trent Hall stable	99	40	--	300 yards.
Large lone tree	113	51	--	150 yards.
REFERENCE STATION	127	10	30	17.18 meters.
"Catholic Church Cross"	219	22	20	2¾ miles.
Right end of peak of roof of Holland Point Wharf	233	05	--	2¼ miles.
Right chimney of smaller of two houses among trees	284	01	--	2 miles.
Right chimney of house	300	35	--	5½ miles.
Right corner of shanty	300	36	--	47 yards.

COLLINS.

General locality.—Southwest shore of Patuxent River about ¼ mile northeast of entrance to Washington Creek on point opposite Sheridan Point. (See Chart No. 19.)

Immediate locality.—Observed station is on marsh land about 1 foot above high-water mark, 16 yards west of shore, 20 yards northwest of shore, 21 yards southwest of shore, 300 yards northeast of a tall lone tree and 300 yards southeast of house known as Trent Hall.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—	°	′	″		
"Sheridan" (S 80° 59′ E)	0	00	00		¾ mile.
Left end of peak of roof of De La Brooke Pier	52	12	--		2¼ miles.
Right side of right chimney of large painted brick house	60	23	--		2¼ miles.
Near corner of Thomas house (Cremona)	73	22	--		1 mile.
Smoke pipe in chimney on store	98	28	--		½ mile.
Large lone tree	129	07	--		300 yards.
Small lone tree	175	10	--		130 yards.
Near corner of Trent Hall Wharf house	244	37	--		½ mile.
Chimney on end of roof of house among trees	287	41	--		2¼ miles.
Left corner of left chimney of Dowell house	354	11	--		1 mile.

SHERIDAN.

General locality.—Northeast shore of Patuxent River on Sheridan Point. (See Chart No. 19.)

Immediate locality.—Observed station is on sand and grass point near edge of the grass, about 2 feet above high-water mark, 6 yards east of extreme edge of grass on point, 8 yards north of grass edge and 7 yards south of grass edge. Cement monument marking reference station is 14.13 meters N 49° 56′ E of observed station.

Marks.—Observed station is nail in stub with top 6 inches above ground. Reference station is center point of triangle on standard cement monument.

References.—	°	′	″		
"Kitt" (S 66° 05′ E)	0	00	00		1¼ miles.
Right tangent of brick house	10	41	--		6 miles.
Left end of peak of roof of De La Brooke Pier	56	13	--		1¾ miles.
Left corner of left chimney of Thomas house (Cremona)	102	38	--		1¼ miles.
Smoke pipe on several gable house	124	25	--		1¼ miles.
Right tangent of Trent Hall Wharf	192	00	--		1 mile.
Catholic Church at Benedict	216	56	--		3½ miles.
REFERENCE STATION	296	01	00		14.13 meters.
Near chimney of Dowell house	325	23	--		¼ mile.

CREMONA.

General locality.—Southwest shore of Patuxent River about half way between Cremona and Persimmon creeks. (See Chart No. 19.)

Immediate locality.—Observed station is in orchard on farm known as Cremona, about 6 feet above high-water mark, 10 yards south of edge of river bank, 7 yards south of rail fence which runs west and east to door yard fence, 36 yards east of rail fence of cornfield, 75 yards north of rail fence at cornfield and 53 yards west of picket fence. Several mountain dwarf cherry trees stand between fence and river bank edge.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—	°	′	″		
"Kitt" (N 84° 13′ E)	0	00	00		2 miles.
Near end of peak of roof of Young Hance house	16	26	--		3 miles.
Nail in blaze in apple tree (24 inches diameter)	37	38	20		24.55 meters.

	°	′	″		
Nail in blaze in apple tree (16 inches diameter)	62	43	30	------	13.12 meters.
Nail in blaze in apple tree (15 inches diameter)	100	33	30	------	16.11 meters.
Corner of field	181	55	--	------	87 yards.
Corner of field	233	32	--	------	38 yards.

KITT.

General locality.—Northeast shore of Patuxent River on Kitts Marsh Point, which is about halfway between Battle Creek and Sheridan Point. (See Chart No. 19.)

Immediate locality.—Observed station is on the point of a long marsh neck, about 15 yards northeast of extreme end of point, 13 yards north of edge of marsh, and 13 yards east of edge of marsh. There are no permanent reference objects near station. Cement monument marking reference station is 15.84 meters N 10° 23′ E of observed station.

Marks.—Observed station is nail in stub flush with surface of marsh. Reference station is center point of triangle on standard cement monument.

References.—

	°	′	″		
"Battle" (S 39° 02′ E)	0	00	00	------	1⅛ miles.
Right tangent of Long Marsh	7	53	--	------	2 miles.
Near end of peak of roof of De La Brooke Pier	73	52	--	------	1½ miles.
Near corner of near chimney of Thomas house	83	31	--	------	1¾ miles.
Large house	167	38	--	------	1 mile.
Square chimney of large house	185	23	--	------	¼ mile.
REFERENCE STATION	229	24	40	------	15.84 meters.
Left chimney of house	243	56	--	------	2½ miles.
Hance house	299	13	--	------	2 miles.
Right chimney of house among trees on hill	327	24	--	------	4 miles.
Left chimney of house	336	59	--	------	4 miles.

OPPKIT.

General locality.—Southwest shore of Patuxent River on Marsh Point. (See Chart No. 19.)

Immediate locality.—Observed station is on sand and grass ridge between sand beach and marsh, about 1 foot above high water, 3 yards southwest of high water mark, 60 yards west-northwest of one point of the beach, 64 yards south of another point of the beach, and 85 yards north-northwest of an oyster watch house on piles. There are no permanent reference objects near station.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—

	°	′	″		
"Kitt" (N 56° 31′ E)	0	00	00	------	1½ miles.
Near end of peak of roof of Williams Wharf house	36	46	--	------	2½ miles.
Left corner of watch house	87	27	--	------	85 yards
Left point of peak of roof of De La Brooke Pier	94	09	--	------	1 mile.
Right corner of right chimney of brick house	126	42	--	------	½ mile.
Chimney on house near trees	232	43	--	------	¾ mile.
Highest chimney on Cremona House	254	49	--	------	⅞ mile.
Point of roof of Dukes Wharf	310	09	--	------	1½ miles.
Chimney on house with ell	330	49	--	------	1½ miles.
Large square brick chimney on house with ell	334	08	--	------	1½ miles.
Nearest chimney of pair on end of house	353	00	--	------	1½ miles.

BATTLE.

General locality.—Northeast shore of Patuxent River on west side of entrance to Battle Creek on Prison Point. (See Chart No. 19.)

Immediate locality.—Observed station is on sand and grass land between marsh and river, about 1 foot above high water, 85 yards south of a field, 6 yards northeast of shore, 20 yards southwest of edge of a pool, 100 yards southwest by west of a lone tree, 200 yards west of a small house among trees, and 100 yards west to northwest of several dwarf trees between house and beach.

Marks.—Observed station is center point of triangle on standard cement monument.

References—

	°	′	″	
"Forr" (S 3° 17′ E)	0	00	00	2¼ miles.
Chimney on middle of roof of house	1	52	--	2¼ miles.
Left corner of left chimney of very large house	8	36	--	2¼ miles.
Right chimney of large 2½-story brick house	82	00	--	1½ miles.
Tangent to Sheridan Point	129	20	--	2½ miles.
Right end of peak of roof of 2½-story house	139	50	--	2¼ miles.
Chimney of 2½-story house on hill	155	19	--	2 miles.
Lone tree	254	41	--	80 yards.
Outside chimney of house on hill	264	11	--	3 miles.
House among trees	282	15	--	100 yards.
Tangent of Long Marsh	341	45	--	1½ miles.
Left chimney of 2½-story house	348	38	--	3 miles.
Chimney of 2½-story house	352	57	--	2 miles.
Right tangent of Forrest Wharf	357	59	--	1½ miles.

PHOTO.

General locality.—Northeast side of Patuxent River on east side of entrance to Jacks Bay. (See Chart No. 19.)

Immediate locality.—Observed station is in a cultivated field, about 150 yards north-northeast of a marshy point, 10 feet above high-water mark, 49 yards east of shore, 110 yards north northwest of shore, and 68 yards northeast of right end of clump of trees at edge of field and beginning of marsh point.

Marks.—Observed station is nail in stub with top 2 inches above surface of ground. Subsurface mark is center point of triangle on standard cement monument with top 12 inches below surface.

References.—

	°	′	″	
"Slim" (S 52° 03′ E)	0	00	00	1⅛ miles.
Chimney on old house	51	21	--	2 miles.
Cedar trees	60	00	--	85 yards.
Left corner of house	73	03	--	2 miles.
Smoke pipe on house behind trees	78	08	00	2 miles.
Left tangent of Forrest Wharf	81	00	20	2¼ miles.
Tree	90	10	--	70 yards.
Watchhouse on point	118	52	--	½ mile.
Right chimney on 2½-story brick house	150	37	--	5 miles.
Locust tree (20 inches diameter)	241	23	--	135 yards.
Left chimney of house	222	45	--	½ mile.
Willow tree	331	27	--	140 yards

FIGHT.

General locality.—Southwest shore of Patuxent River opposite mouth of Battle Creek on a prominent low point. (See Chart No. 19.)

Immediate locality.—Observed station is on land known as Horsehead Marsh, about 1 foot above ordinary high-water mark, 12 yards south-southwest of extreme end of point, 15 yards west-northwest of shore at small creek, 40 yards northeast of woods, and 110 yards east-southeast of a bluff 50 feet high.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—

	°	′	″		
"Battle" (N 50° 45′ E)	0	00	00	------	1¾ miles.
Outside chimney in center of group of buildings	13	30	--	------	2¼ miles.
Left chimney of house on top of hill	23	44	--	------	3¾ miles.
Left tangent of Forrest Wharf	82	06	10	------	2 miles.
Near end of peak of roof of 2½-story building	83	47	--	------	1¾ miles.
Large square chimney on large building	91	19	--	------	1 mile.
Left corner of left chimney of large house	262	40	--	------	1 mile.
Dowells windmill	300	28	--	------	2½ miles.
Left chimney on small house adjoining large house	321	41	--	------	2¼ miles.
Chimney of small house	325	38	--	------	2 miles.

SLIM.

General locality.—Northeast shore of Patuxent River about half way between Battle and Island creeks and ½ mile west northwest of Parkers Wharf. (See Chart No. 19.)

Immediate locality.—Observed station is in a field on a sand bluff, about 40 feet above high water, 13 yards northeast of edge of bluff, 90 yards southeast of a point of woods at top of a ravine, about 189 yards southwest of another point of woods, 150 yards west-northwest of a rail fence, and 71 yards northwest by west of a large sycamore tree.

Marks.—Observed station is nail in round chestnut stub with top about 6 inches above the surface of the ground. Subsurface mark is center point of triangle on standard cement monument with top 10 inches below the surface of the ground.

References.—

	°	′	″		
"Island" (S 59° 31′ E)	0	00	00	------	2½ miles.
Cedar in field	2	38	50	------	200 yards.
Large sycamore tree	29	20	--	------	71 yards.
Near end of peak of roof of Jones Wharf house	53	27	--	------	2½ miles.
Chimney on middle of roof of a long house	109	34	--	------	1¾ miles.
Outside chimney of house near Forrest Wharf	125	26	--	------	2 miles.
Nearest chimney on Thomas large brick house	166	16	--	------	4 miles.
Tangent of Long Point marsh	171	24	--	------	1½ miles.
Left tree on point	191	06	--	------	90 yards.
Two high trees close together near right edge of point of woods	284	27	--	------	189 yards.
Large walnut tree	298	20	--	------	¼ mile.
Near end of peak of roof of barn	304	23	--	------	½ mile.

FORR.

General locality.—Southwest shore of Patuxent River just below Forrest Wharf. (See Chart No. 19.)

Immediate locality.—Observed station is about 1 foot above high-water mark on sand and grass land, 7 yards south from extreme high-water mark, 45 yards southeast of land end of Forrest Wharf, 70 yards east by south of an old 2½-story building, and 65 yards northeast of a saloon.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—

	°	′	″		
"Cole" (S 50° 07′ E)	0	00	00	------	1⅜ miles.
Near corner of house on hillside	9	59	--	------	180 yards.
Near corner of saloon	101	52	--	------	65 yards.

	°	′	″		
Outside chimney on house on hill	115	22	--	------	⅛ mile.
Curve in road up hill	131	25	--	------	200 yards.
West corner of old 2½-story building	139	52	--	------	70 yards.
Land end of wharf	169	15	--	------	45 yards.
Windmill	182	59	40	------	2¾ miles.
Left corner of left chimney brick house	183	05	--	------	3 miles.
Right tangent of Dukes Wharf	187	07	--	------	4¼ miles.
Near end of peak of roof of Forrest Wharf house	257	17	--	------	⅛ mile.
Chimney of house	272	35	--	------	3 or 4 miles.
Right tangent of roof	304	23	--	------	2½ miles.
Tangent of trees	347	46	--	------	3 miles.

SWEEP.

General locality.—Northeast shore of Patuxent River on northwest side of mouth of Island Creek near inner end of neck of land joining Broome Island to the mainland. (See Chart No. 19.)

Immediate locality.—Observed station is in a field about 4 feet above high water, 4 feet northwest of a wire fence, 24 yards south by west of a stable, 60 yards south-southwest of a house, and 100 yards south-southeast of a pine grove. Cement monument marking reference station is 21.70 meters N 59° 39′ E of station and near fence line.

Marks.—Observed station is the center of an oblong wooden box 4 inches square with top 4 inches above the ground. Reference station is center point of triangle on a standard cement monument.

References.—

	°	′	″		
"Bars" (S 15° 10′ E)	0	00	00	------	2 miles.
Right chimney of house	14	48	--	------	3 miles.
Peak of roof of Gadden house	25	34	20	------	1⅝ miles.
Tangent of Broome Island Point	43	21	--	------	½ mile.
Chimney on house on hill	51	57	--	------	3 miles.
Gilt ball on lightning rod	62	03	--	------	⅜ mile.
Chimney on house	96	06	--	------	¼ mile.
Cut in woods	135	40	--	------	1⅞ miles.
Chimney of house	186	34	--	------	150 yards.
Tile smoke pipe on house	203	24	--	------	140 yards.
Near corner of house	230	35	--	------	60 yards.
Near corner of barn	237	32	--	------	24 yards.
REFERENCE STATION	254	49	20	------	21.70 meters.
Right chimney of four on house	279	25	--	------	¼ mile.
Top of tower of house	301	54	--	------	2½ miles.

ISLAND.

General locality.—Northeast shore of Patuxent River on the extreme southeast point of land about ½ mile to the east of the mouth of Island Creek. (See Chart No. 19.)

Immediate locality.—Observed station is on a marshy point at about extreme high-water mark, 30 yards north of extreme end of point, 25 yards east of one side of point, and 20 yards west of another side of point. Old tile pipe used as a reference station is 16.98 meters N 12° 39′ E and cement monument marking new reference station is 30.93 meters N 2° 40′ E of observed station.

Marks.—Observed station is nail in stub with top flush with marsh. Old reference station is center of 4-inch tile pipe set in cement with top projecting about 10 inches above ground. New reference station is center point of triangle on standard cement monument.

References.—

	°	′	″		
"Wheat" (S 53° 15′ E)	0	00	00	------	2 miles.
Left end of peak of roof of Sotterly Wharf house	46	07	--	------	2 miles.
Pinnacle of large house in trees	60	49	--	------	2 miles.

	°	′	″		
Left chimney of large house back on hill	67	54	--	------	2 miles.
Chimney on middle of large 2½-story house	109	59	--	------	1½ miles.
Middle of railing on top of roof of 2½-story house	120	00	--	------	3 miles.
Chimney of Broome house	143	41	--	------	¾ mile.
Weather vane on Broome house	148	33	30	------	¾ mile.
Right chimney of house	178	21	--	------	3 miles.
Right chimney of house	193	27	--	------	2 miles.
REFERENCE STATION (cement monument)	235	55	00	------	30.93 meters.
REFERENCE STATION (tile pipe)	245	54	20	------	16.98 meters
Smoke pipe of watchhouse	333	29	--	------	1 mile.
Tower of Peterson house	356	08	--	------	2 miles.

PEAK.

General locality.—Northeast shore of Patuxent River, about in middle of inner shore of a large bay between St. Leonard and Island creeks. (See Chart No. 19.)

Immediate locality.—Observed station is on Parran house, located near shore at extreme end of a road leading to Wallville.

Marks.—Observed station is ball on tip of tower.

References.—None necessary.

COLE.

General locality.—Southwest shore of Patuxent River, about ¼ mile northwest of Cole Creek. (See Chart No. 19.)

Immediate locality.—Observed station is about 35 feet above high-water mark on a grass peninsula, 3 yards south-southwest of edge of a bluff which is washing rapidly, 8 yards west of extreme edge of bluff, where it turns inland and is not washing, but slopes gradually to the water, 8 yards north of another edge of the bluff, 10 yards northwest of trees on slope of bank, and 20 yards west of a cherry tree 2 feet in diameter. Cement monument marking reference station is 13.53 meters S 83° 10′ W of observed station and nearly on line with large cherry tree.

Marks.—Observed station is nail in stub with top flush with ground. Reference station is center point of triangle on standard cement monument.

References.—

	°	′	″		
"Hutchins" (S 67° 12′ E)	0	00	00	------	2 miles.
Left end of peak of roof on Jones Wharf house	6	25	--	------	1½ miles.
Nail in blaze on limb of oak tree (4 inches diameter)	22	05	--	------	10.80 meters.
Screw in blaze in crotch of oak tree (15 inches diameter at base)	38	18	--	------	12.67 meters.
Nail in blaze of cedar tree (6 inches diameter)	63	40	40	------	8.43 meters.
Nail in blaze on cherry tree (24 inches diameter)	147	11	--	------	18.65 meters.
REFERENCE STATION	150	22	00	------	13.53 meters.
Right chimney of house	179	11	--	------	¼ mile.
Right end of peak of roof of Forrest Wharf house	202	21	--	------	1½ miles.
Right end of house	251	05	--	------	3 miles.
Left end of peak of house	280	23	--	------	3 miles.
Gilt ball on Broome house	321	30	30	------	2 miles.
Right tangent of Broome Island	334	17	--	------	1¾ miles.

HUTCHINS.

General locality.—Southwest shore of Patuxent River opposite Broome Island on Captain Point, about ¼ mile northwest of mouth of Cole Creek. (See Chart No. 19.)

Immediate locality.—Observed station is in garden on point of a bluff 50 feet high on Hutchins estate near house occupied by Mr. Gadden, about 6 yards south by east of extreme point of bluff, 2 yards southwest of edge of bluff, 4 yards southeast of edge of bluff, 30 yards north by west from house, 30 yards west of a wire fence running north and south, and 15 yards east of another north-and-south wire fence. Cement monument marking reference station is 7.57 meters S 59° 39′ W of observed station.

Marks.—Observed station is nail in a stub with top flush with ground. Reference station is center point of triangle on standard cement monument.

References.—	°	′	″	
"Bars" (S 68° 07′ E)	0	00	00	⅞ mile.
Left corner of extension of Gadden house	58	17	--	30.90 meters.
Right front corner of Gadden house	84	56	--	28.57 meters.
Near corner of well house	102	15	--	30.44 meters.
Near corner of shed	119	43	--	45 yards.
REFERENCE STATION	127	46	--	7.57 meters.
Nail in blaze in apple tree (22 inches diameter)	148	06	20	9.35 meters.
Right tangent of Parkers Wharf	228	12	--	2½ miles.
Gilt ball on Broome house on Broome Island	249	55	--	1½ miles.
Near end of peak of house	263	17	--	4 miles.
Tip of tower on Peterson house	332	52	--	2½ miles.

WHEAT.

General locality.—Northeast shore of Patuxent River on westerly side of mouth of St. Leonard Creek. (See Charts Nos. 19 and 20.)

Immediate locality.—Observed station is on a bluff about 40 feet above high water, about 5 yards west of edge of bank, 7 yards south of another edge, and ⅜ mile west of Peterson house. Cement monument marking reference station is 12.80 meters N 61° 55′ E of observed station and on line to Peterson house.

Marks.—Observed station is center of a 4-inch tile pipe set in cement with top projecting about 4 inches above ground. Reference station is center point of triangle on standard cement monument.

References.—	°	′	″	
"Stump" (S 36° 23′ E)	0	00	00	2¼ miles.
Left chimney of Judge Crane house	10	07	--	4¾ miles.
Near end of peak of roof of Marburger house.	15	05	--	4¼ miles.
Left end of roof of St. Cuthbert Wharf	24	09	--	2¼ miles.
Chimney on roof of house	60	05	--	1½ miles.
Chimney on store at Sotterly	93	41	--	1½ miles.
Left end of barn roof	193	27	--	2 miles.
REFERENCE STATION	278	17	30	12.80 meters.
Center chimney of Peterson house	281	22	--	¼ mile.
Chimney of house	298	03	--	⅛ mile.
Chimney on house on Breeden estate	340	04	--	2 miles.

MACKALL.

General locality.—Northwest shore of Patuxent River on west side of entrance to St. Leonard Creek on first point inside of Peterson Point. (See Charts Nos. 19 and 20.)

Immediate locality.—Observed station is about 50 feet above high water, 9 feet northwest of edge of bluff, 7 yards northeast of bushes, and 3 yards southwest of other bushes. Cement monument marking reference station is 3.80 meters N 35° 08′ W of observed station.

Marks.—Observed station is the center of an oblong wooden box 4 inches square with top 3 inches above the ground. Reference station is center point of triangle on standard cement monument.

References.—	°	′	″		
"Stock" (S 34° 38′ W)	0	00	00		1¾ miles.
Peak of front gable of Bond house	0	39	10		1¾ miles.
Chimney on negro house	54	31			⅜ mile.
Chimney on Peterson house	66	25			¼ mile.
REFERENCE STATION	110	13	50		3.80 meters.
Chimney on negro house	135	49			⅜ mile.
Chimney on ell of house on hill	153	46			½ mile.
Chimney on small house back of Sollers Wharf	229	40			1 mile.
Nearest outside chimney on 1½-story house.	236	08			2 miles.
Large chimney on Sollers house	237	02			¾ mile.
Large chimney on Taylor house	285	27			½ mile.
Front peak of Briscoe house	334	30			2⅛ miles.

SOLLERS.

General locality.—Northeast shore of Patuxent River on east side of entrance to St. Leonard Creek. (See Charts Nos. 19 and 20.)

Immediate locality.—Observed station is about 50 feet above high water, 6 feet east of edge of bank, 20 yards north-northeast of a clump of trees, 14 yards and 8 yards south-southwest of other trees, and 75 yards north-northwest of a rail fence. Cement monument marking reference station is 13.68 meters S. 44° 00′ E of observed station with top buried 12 inches below surface.

Marks.—Observed station is the center of an oblong wooden box 5 inches square with top 3 inches above ground. Reference station is center point of triangle on standard cement monument with top 12 inches below surface.

References.—	°	′	″		
"Stock" (S 44° 24′ W)	0	00	00		1⅝ miles.
Middle of front gable of Bond house	0	34			1¾ miles.
Chimney of store at Sotterly Wharf	26	58			2⅛ miles.
Near corner of outside chimney on house	27	18			2½ miles.
Chimney on top of Gadden house	46	14			2⅞ miles.
Near corner of top chimney on Peterson house	78	27			½ mile.
Right end of peak of roof of Mackall house	150	16			½ mile.
REFERENCE STATION	271	35	30		13.68 meters.
Near corner of large chimney on Taylor house	272	35			⅛ mile.
Top of front gable on Briscoe house	331	36			1¾ miles.

BARS.

General locality.—Southwest shore of Patuxent River on Sotterly Point about ¼ mile northwest of Sotterly Wharf. (See Chart No. 19.)

Immediate locality.—Observed station is on a bluff about 30 feet above high water, 5 yards south of edge of bank at rail fence, and 2 yards east of this same fence. Cement monument marking reference station is 14.53 meters S 9° 54′ W of observed station and near fence line.

Marks.—Observed station is center of a 3-inch tile pipe set in cement. Reference station is center point of triangle on standard cement monument.

References.—	°	′	″		
"Wheat" (N 72° 06′ E)	0	00	00		1½ miles.
Chimney on middle of 2½-story house	17	29			6 miles.
Windmill	23	23			3 miles.
Chimney of house	41	50			4 miles.
REFERENCE STATION	117	48	00		14.53 meters.
Smoke pipe on right end of house	157	37			¼ mile.
Tangent of point of land	250	47			1½ miles.
Peterson house chimney	359	22			1¾ miles.

LEND.

General locality.—Northeast shore of Patuxent River on a narrow strip of land or peninsula in mouth of Mears Creek about ½ mile southeast of St. Leonard Creek. (See Charts Nos. 19 and 20.)

Immediate locality.—Observed station is in the midst of many cherry, oak, and locust trees about 15 feet above high-water mark, 15 yards east-northeast of high ground, 5 yards west of edge and 17 yards north of extreme point of top of peninsula.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—

	°	′	″	
"Wheat" (N 50° 51′ W)	0	00	00	1¼ miles.
Nail in blaze in cherry tree (4 inches diameter)	118	28	30	3.58 meters.
Right chimney of house across creek	139	51	--	¼ mile.
Nail in blaze in oak tree (8 inches diameter)	229	51	--	6.68 meters.
Outside chimney on left end of Briscoe house	265	61	--	1½ miles.
Near peak of Bond house	297	57	--	1⅝ miles.
Chimney on storehouse at Sotterly	318	19	--	2¼ miles.
Near end of peak of roof of Sotterly Wharf house	319	07	--	2¼ miles.
Chimney on Gadden house	330	47	--	3¼ miles.
Nail in blaze in cherry tree (6 inches diameter)	345	24	--	3.64 meters.

STOCK.

General locality.—Southwest shore of Patuxent River about 1 mile southeast of Sotterly Point. (See Chart No. 19.)

Immediate locality.—Observed station is on a bluff, about 20 feet above high water, 3 yards southwest of edge of bluff, about 50 yards east by north of front door of the house of Mr. Bond, 30 yards west-northwest of extreme end of point of bluff, 35 yards northeast of detached house, and about 43 yards east by south of yard fence at edge of bluff.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—

	°	′	″	
"Lend" (N 66° 48′ E)	0	00	00	1⅝ miles.
Right chimney of house on Dickson place	1	35	--	1¾ miles.
Right chimney of old 1½-story house	19	00	--	2 miles.
Tangent of bluff	58	00	--	1 mile.
Chimney on house on point	59	03	--	1 mile.
Nail in blaze in locust tree (4 inches diameter)	99	48	30	2.18 meters.
Nearest corner of outhouse, corner farthest from house	161	29	30	34.30 meters.
Left corner of house	180	31	30	31.13 meters.
Nail in blaze in cherry tree 1 foot above ground (4 feet diameter)	183	39	30	20.58 meters.
Right corner of house	205	29	40	45.79 meters.
Locust tree (4 inches diameter)	210	31	40	8.83 meters.
End of yard fence	230	31	--	43 yards.
Tree near edge of bank (no nail or blaze)	237	39	20	34.27 meters.

STUMP.

General locality.—Northeast shore of Patuxent River about ½ mile northwest of Hellen Creek. (See Chart No. 20.)

Immediate locality.—Observed station is on a bank about 20 feet above high water, 10 yards north-northeast of edge of bank at extreme end of point, about 20 yards southeast of edge of bank, and about

150 yards northwest of a clump of cedar and locust trees at edge of bank. Cement monument marking first reference station is 11.29 meters N 61° 51′ E of observed station with top 10 inches below surface of field. Cement monument marking second reference station is 26.22 meters N 60° 42′ E of observed station about on line with first reference station.

Marks.—Observed station is center of 4-inch tile pipe set in cement with top flush with ground. First reference station is center point of triangle on standard cement monument with top 10 inches below the surface of ground. Second reference station is center point of triangle on standard cement monument with top 6 inches above surface of ground.

References.—

	°	′	″	
"Wheat" (N 36° 23′ W)	0	00	00	2⅛ miles.
Chimney in center of house	15	09	--	¾ mile.
SECOND REFERENCE STATION	97	43	35	26.22 meters.
FIRST REFERENCE STATION	98	52	30	11.29 meters.
Apple tree	152	00	--	200 yards.
Left chimney of house	180	19	--	¾ mile.
Near end of peak of roof of Marburger house	209	27	--	2¼ miles.
Left chimney of house	269	21	--	1¾ miles.
Nail in blaze in stump (30 inches daimeter)	250	49	--	5.01 meters.
Nail in blaze in tree (8 inches diameter)	352	30	--	17.52 meters.

BRISCOE.

General locality.—Southeast shore of Patuxent River about ¼ mile northwest of St. Cuthbert Wharf. (See Chart No. 19.)

Immediate locality.—Observed station is in a cultivated field, about 20 feet above high water, 80 yards southwest of trees on bank, 50 yards southeast of a creek bed, 46 yards northwest of a clump of trees, 105 yards east of a corner of fence on road, and about 300 yards northeast of another fence with woods back of it. Cement monument marking reference station is 12.52 meters N 79° 35′ W of observed station.

Marks.—Observed station is a nail in a stub with top flush with ground and a subsurface mark of a standard cement monument with top buried 11 inches below the surface. Reference station is center of triangle on standard cement monument with top 5 inches above surface of ground.

References.—

	°	′	″	
"Hellen" (S 71° 37′ E)	0	00	00	1⅝ miles.
Near corner of house	45	11	--	¾ mile.
Left end of peak of roof of barn	57	18	--	¾ mile.
Large two-forked tree	129	17	--	130 yards.
Corner of rail fence and tree	136	34	--	105 yards.
REFERENCE STATION	172	01	40	12.52 meters.
Large cherry tree other side of creek	195	00	--	68 yards.
Left chimney of house on opposite side with three dormer windows	304	54	--	1½ miles.
Cedar tree	308	59	--	80 yards.

HELLEN.

General locality.—Northeast shore of Patuxent River on east side of mouth of Hellen Creek. (See Chart No. 20.)

Immediate locality.—Observed station is at high-water mark on edge of grass and bushes, about 16 yards west-southwest of a bluff 15 feet high, and about 40 yards north-northwest of bluff at edge of water. Cement monument marking reference station is 12.45 meters N 75° 14′ E of observed station.

Marks.—Observed station was the center of a tile pipe with a subsurface mark of a green yeast-powder bottle but at date of publication these marks are reported to have been washed away. Reference station is center point of triangle on standard cement monument.

References.—	°	′	″		
"Stump" (N 25° 42′ W)	0	00	00	------	⅞ mile.
Left chimney of Barrett house	8	54	--	------	¾ mile.
Nail in blaze in tree	100	01	40	------	14.74 meters.
REFERENCE STATION	100	56	20	------	12.45 meters.
Near end of peak of roof of Marburger house	209	54	--	-- ---	1½ miles.
Mouth of Cuckold Creek	261	00	--	------	1½ miles.
Chimney of Peterson house	355	14	--	------	3 miles.

NAT.

General locality.—Southwest shore of Patuxent River about ½ mile above mouth of Cuckold Creek. (See Chart No. 20.)

Immediate locality.—Observed station is near edge of a cultivated field on a bluff of sand and gravel about 20 feet above high water, 4 feet east of edge of bluff, and 150 yards north of a rail fence. Cement monument marking reference station is 18.44 meters S 29° 47′ W of observed station with top 8 inches below surface of ground.

Marks.—Observed station is center of 3-inch tile pipe embedded in cement. Reference station is center point of triangle on standard cement monument.

References.—	°	′	″		
"Hellen" (N 69° 29′ E)	0	00	00	------	1¼ miles.
Near end of peak of roof of Marburger house on Point Patience	68	01	--	------	1½ miles.
REFERENCE STATION	140	18	00	------	18.44 meters.
Large chimney on house	281	58	--	------	3 miles.
Right chimney of house with two gable roofs	309	01	--	------	2 miles.

TON.

General locality.—Eastern shore of Patuxent River about 1 mile northeast of Point Patience. (See Chart No. 20.)

Immediate locality.—Observed station is on a bluff about 15 feet above high water, 10 yards east from edge of bluff, 50 yards south-southwest of edge of a gully and a clump of trees, and about 220 yards west-northwest of a cherry tree 3½ feet in diameter. Cement monument marking reference station is 13.64 meters S 62° 29′ E of observed station.

Marks.—Observed station is a spike set in cement. Reference station is center point of triangle on standard cement monument buried below surface 10 inches.

References.—	°	′	″		
"Mill" (S 65° 00 W)	0	00	00	------	1¼ miles.
Chimney on far end of Wallace house	53	28	--	------	1¾ miles.
Chimney on middle of roof on McCorry store	60	09	--	------	2 miles
Near end of peak of St. Cuthbert Wharf house	62	10	--	------	2 miles
Near end of peak of roof of Parran oyster watch house	83	03	--	------	5½ miles
Chimney on Peterson house	85	39	--	------	3¾ miles
Cemented chimney on near end of George old house	94	59	--	------	1 mile.
Left chimney of Costen house	117	59	--	------	½ miles.
Nail in blaze in tree	137	35	20	------	47.60 meters.
REFERENCE STATION	232	31	00	------	13.64 meters.
Left chimney of Marburger house	329	11	--	------	¾ mile.

MILL.

General locality.—Southwest shore of Patuxent River about ½ mile southeast of mouth of Cuckold Creek and ½ mile northwest of Point Patience. (See Chart No. 20.)

Immediate locality.—Observed station is on a sand bluff about 20 feet above high water, 7 yards southwest of the edge of the bluff, 40 yards southeast of a fence and a line of cedar trees, and about 100 yards northwest of another fence at bottom of hill. Cement monument marking reference station is 13.76 meters S 28° 14′ W of observed station.

Marks.—Observed station is center point of 3-inch tile pipe embedded in cement. Reference station is center point of triangle on standard cement monument.

References.—

	°	′	″		
"Ton" (N 64° 59′ E)	0	00	00	------	1¼ miles.
Nearest chimney of Marburger house on Point Patience	39	01	--	------	¾ mile.
"Catholic Church Cross"	43	03	40	------	2 miles.
"Methodist Episcopal Church Spire"	49	23	30	------	2 miles.
Middle of portico of Judge Crane house	82	22	--	------	1 mile.
Windmill near Dent house	136	47	--	------	½ mile.
REFERENCE STATION	143	14	40	------	13.76 meters.
Chimney on house among farm buildings	293	28	40	------	4¼ miles.
Left chimney on house with piazza	304	02	--	------	2¾ miles.
End of peak of roof of 2½-story house	323	31	--	------	1¾ miles.
Nearest chimney of cottage	338	17	--	------	2 miles.
Left chimney of house	340	19	--	------	2 miles.

BUR.

General locality.—East shore of Patuxent River, on northwest side of Point Patience, about ¼ mile northeast of its extreme end. (See Chart No. 20.)

Immediate locality.—Observed station is on sand and grass land, about 1 foot above high water, 12 yards southeast of high-water mark on one side of point, 36 yards northwest of high-water mark on other side of point, and about 300 yards northeast of extreme end of point. Cement monument marking reference station is 12.15 meters N 85° 20′ E of observed station.

Marks.—Observed station is a 3-inch tile pipe set in cement with top about 1 inch above the surface of the ground. Reference station is center point of triangle on standard cement monument.

References.—

	°	′	″		
"Ton" (N 37° 56′ E)	0	00	00	------	1 mile.
Left chimney of Marburger house	16	08	--	------	¼ mile.
REFERENCE STATION	47	24	30	------	12.15 meters.
"Methodist Episcopal Church Spire"	75	32	10	------	1⅜ miles.
Middle gable of Judge Crane house	139	09	--	------	½ mile.
Nail in blaze in pine tree (8 inches diameter)	162	40	10	------	25.94 meters.
Square chimney on Dent house	228	30	--	------	¾ mile.
Chimney on house	268	52	--	------	1⅝ miles.
Left chimney of house	346	39	--	------	1½ miles.
Right chimney of house	358	31	--	------	1½ miles.

NEW.

General locality.—Northeast side of Patuxent River, about ¾ mile east of Point Patience and about 1¼ miles northwest of Sandy Point. (See Chart No. 20.)

Immediate locality.—Observed station is about 20 feet above high-water mark in the middle of a cultivated field on Strathmore farm, about 230 yards northeast of shore of Patuxent River, about 82 yards southeastof a creek, about 162 yards northwest of a small creek or ditch, 230 yards northeast of a large oak tree, and 250 yards north of another large oak tree.

Marks.—Observed station is center point of triangle on standard cement monument with top 11 inches below the surface of the ground.

References.—

	°	′	″		
"Ben" (S 2° 10′ E)	0	00	00	------	2 miles.
Chimney on flat-roof house	6	59	--	------	1¾ miles.
Chimney on main part of a house on Town Creek	27	11	--	------	1¼ miles.
Oak tree about 18 inches diameter on edge of field	43	54	--	------	227 yards.
Right tangent of Spencers wharf	56	04	--	------	1 mile.
Corner of field	67	00	--	------	310 yards.
Exposed chimney on left of house	67	36	--	------	1½ miles.
Left chimney on house	88	57	--	------	1½ miles.
Corner of field	206	00	--	------	240 yards.
Corner of field	258	00	--	------	300 yards.
Silver-tipped tower on Philip Vale house	307	08	20	------	½ mile.
Oak at edge of field	343	35	--	------	300 yards.

CATHOLIC CHURCH CROSS.

General locality.—Southeast side of Patuxent River, about halfway to Back Creek and ¾ mile northwest of Solomons wharf. (See Chart No. 20.)

Immediate locality.—Observed station is on Catholic Church, known as St. Marys Star of the Sea, located in small village of Johnstown on mainland near Solomons Island, and about 250 yards north of causeway to Solomons Island.

Marks.—Observed station is center of cross on bell cupola.

References.—None necessary.

CABLE.

General locality.—Southwest shore of Patuxent River, on east side of entrance to Kings Creek, and about ¾ mile west of Town Point. (See Chart No. 20.)

Immediate locality.—Observed station is on pasture land near the end of high land at the beginning of a long, low peninsula which almost closes the mouth of Kings Creek, about 30 feet above high-water mark, about 20 yards south of edge of bank on river side, about 15 yards east northeast of edge of bank on creek side, 38 yards southeast of extreme edge of top of bank, and 30 yards west of a persimmon tree.

Marks.—Observed station is center point of triangle on standard cement monument buried with top 10 inches below the surface of ground.

References.—

	°	′	″		
"Bur" (N 35° 17′ E)	0	00	00	------	¾ mile.
Left chimney of Marburger house near Point Patience	3	25	--	------	¾ mile.
"Catholic Church Cross"	43	59	--	------	1¾ miles.
"Methodist Episcopal Church Spire"	52	29	--	------	1¾ miles
Left chimney of Judge Crane house	55	44	--	------	½ mile.
Nail in blaze of tree (18 inches diameter)	179	22	20	------	19.24 meters.
Nail in blaze in red cedar tree (3 inches diameter)	236	25	--	------	16.80 meters.
Nail in blaze in persimmon tree	283	52	10	------	26.22 meters.
Right chimney on Fenner Lee house	284	14	--	------	⅜ mile.
Left chimney of house	302	24	--	------	½ mile.

TOWN.

General locality.—Southwestern shore of Patuxent River, on Town Point, about ¾ mile southeast of Point Patience. (See Chart No. 20.)

Immediate locality.—Observed station is about 20 feet above high-water mark, 9 yards west of edge of bluff, 3 yards south of edge of bluff, 10 yards southeast of extreme edge of high land, 3 yards south of a rail fence, and 2 yards north of cultivated land.

Marks.—Observed station is center point of triangle on standard cement monument.

References.—

	°	′	″		
"Back"	0	00	00	------	½ mile.
"Catholic Church Cross"	8	58	20	------	1 mile.
"Methodist Church Spire"	25	41	20	------	¾ mile.
Cupola on Files store	29	11	--	------	¾ mile.
Nearest chimney on Webster house	43	06	--	------	1¼ miles.
Right end of roof of 2½-story building at Pearsons	67	56	--	------	3 miles.
Near corner of tower on Hodgdon house	93	01	--	------	2⅜ miles.
Chimney on old house	108	18	--	------	1⅜ miles.
Chimney on house	142	53	--	------	1 mile.
Left chimney on Lee house	227	04	--	------	1½ miles.
Marburger house	281	00	--	------	¾ mile.

CRANE.

General locality.—Southwest side of Patuxent River, on northeast side of Town Creek, about ¼ mile southwest of Town Point. (See Chart No. 20.)

Immediate locality.—Observed station is in a cultivated field on Judge Crane farm, about 8 feet above high-water mark, 58 yards east northeast of Town Creek, 105 yards west of a fence, 115 yards west-northwest of a large cherry tree, 200 yards southeast of several detached buildings, and 20 yards east of top of a ravine.

Marks.—Observed station is center point of triangle on standard cement monument with top 10 inches below ground.

References.—

	°	′	″		
"New" (N 36° 51′ E)	0	00	00	------	1 mile.
"Catholic Church Cross"	29	25	--	------	1¼ miles.
Stack on ice plant	37	25	--	------	1¼ miles.
Methodist Episcopal Church Tower	42	15	--	------	1¼ miles.
Cherry tree (4 feet diameter)	71	26	--	------	115 yards.
Canning-house stack	157	27	--	------	¼ mile.
House on point	185	20	--	------	¼ mile.
Chimney on house	244	30	--	------	¾ mile.
Lightning rod on cupola of Judge Crane barn	277	01	30	------	¼ mile.
Right tangent to St. Cuthbert wharf	300	08	--	------	2¾ miles.
Near end of peak of roof of Marburger house	320	49	--	------	⅞ mile.
Middle of gateway	355	23	--	------	⅛ mile.
Oak tree on opposite shore of Patuxent River	359	16	50	------	1 mile.

M. E. CHURCH (SOLOMONS).

General locality.—Northeastern shore of Patuxent River, on upper end of Solomons Island, about ½ mile northwest of Sandy Point. (See Chart No. 20.)

Immediate locality.—Observed station is on Methodist Church at upper end of Solomons Island near beginning of causeway to mainland.

Marks.—Observed station is tip of pyramidal tower on Methodist Church.

References.—None necessary.

K. OF P. FLAGSTAFF (SOLOMONS).

General locality.—Northeastern side of Patuxent River, on Solomons Island, in the town of Solomons. (See Chart No. 20.)

Immediate locality.—Observed station is on flagstaff in front of Knights of Pythias Building.

Marks.—Observed station is center of flagstaff at about the same height as roof of the K. of P. Hall.
References.—None necessary.

SAND.

General locality.—Northeastern side of Patuxent River on Sandy Point on extreme southern point of Solomons Island. (See Chart No. 20.)

Immediate locality.—Observed station is on pasture land about 5 feet above high water, 30 yards north of extreme point of planking protecting the shore from washing, 15 yards northeast of the extreme edge of sand and grass line, and about 13 yards east of top of bank. Cement monument marking reference station is 13.64 meters N 2° 19′ E of observed station.

Marks.—Observed station is nail in southwest side of a 6-inch pile driven into ground with top 6 inches above the surface. Reference station is center point of triangle on standard cement monument.

References.—

	°	′	″		
"Drum Point Light" (N 83° 57′ E)	0	00	00		2 miles.
Right tangent of woods on Hog Point	14	36	--		3 miles.
Left end of peak of roof on 2½-story building at Pearsons	51	03	--		2 miles.
Chimney on storehouse at Millstone	74	18	--		1¾ miles.
Near point of gable of Hodgdon large house with square tower	93	54	--		1½ miles.
Near end of peak of roof of Marburger house	225	22	--		1¾ miles.
Warren house opposite Johnson store	261	22	--		¼ mile.
REFERENCE STATION	278	22	10		13.64 meters.
"K. of P. Flagstaff"	291	58	--		¼ mile.
Right chimney of Dr. Marsh house	320	38	--		⅛ mile.
"Bareda House Cupola"	347	48	30		1½ miles.

FISHSTACK.

General locality.—Northeastern side of Patuxent River on northeastern side of entrance to Mill and Back creeks. (See Chart No. 20.)

Immediate locality.—Observed station is on mainland on fish fertilizer factory located on opposite side of creek from Solomons Island.

Marks.—Observed station is center of smokestack on fish factory.

References.—None necessary.

BON.

General locality.—North shore of Patuxent River about 1¼ miles west-northwest of Drum Point Light and about ½ mile east-northeast of Solomons Island. (See Chart No. 20.)

Immediate locality.—Observed station is on cultivated land, about 5 feet above high water, about 7 yards north of shore, about 90 yards southeast of a 1½-story house on land 10 feet higher than station, and about 75 yards south of a 1½-story brick house. Cement monument marking reference station is 0.67 meters N 45° 29′ E of observed station.

Marks.—Observed station is an inverted nail in center of cement in a 6-inch tile pipe with top flush with surface of ground. Reference station is center point of triangle on standard cement monument.

References.—

	°	′	″		
"Drum Point Light" (S 73° 43′ E)	0	00	00		1¼ miles.
Smoke pipe on oyster watch house	33	32	--		½ mile.
Left end of peak of roof on 2½-story building at Pearsons	52	06	--		2¼ miles.
Left end of peak of roof on house with piazza	82	29	--		2½ miles.

	°	′	″		
Near point of roof of Hodgdon house with square tower	89	14	--	------	2¼ miles.
Chimney on end of house	133	57	--	------	¾ mile.
Left chimney on Weems house	159	37	--	-- --	¼ mile.
Right chimney on wooden house	224	01	--	------	90 yards.
Left side of chimney on brick house	249	54	--	------	75 yards.
REFERENCE STATION	299	12	00	------	0.67 meters.
Near end of peak of house on bluff between trees	336	50	--	------	½ mile.
"Bareda House Cupola"	347	06	--	------	¾ mile.

BAREDA HOUSE CUPOLA.

General locality.—North side of Patuxent River about ½ mile northwest of Drum Point Light. (See Chart No. 20.)

Immediate locality.—Observed station is on Bareda House which is a large 3-story square mansion with square cupola with three windows on each side and a porch all around ground floor, located about 100 yards back from shore on high land.

Marks.—Observed station is center of ornamental design of four brackets on center of cupola.

References.—None necessary.

DRUM POINT LIGHT.

General locality.—Northeastern side of entrance of Patuxent River and a short distance off shore from Drum Point. (See Chart No. 20.)

Immediate locality.—Observed station is on a screw pile structure known as Drum Point Light-House.

Marks.—Observed station is center of black lantern on Drum Point Light-House.

Reference.—

	°	′	″		
"Cedar Point Light" (S 64° 33′ E)	0	00	00	------	3¼ miles.

BEN.

General locality.—Southwestern shore of Patuxent River about 1 mile south-southwest of Sandy Point and 1¼ miles south-southeast of Town Point. (See Chart No. 20.)

Immediate locality.—Observed station is on a clay and sand bluff in a cultivated field, about 20 feet above high-water mark, about 10 feet west of edge of bank, 3 feet south of point covered with scrub pines, about 15 yards northeast of one edge of plateau, 10 yards southeast of another edge of plateau, about 65 yards north of point of woods, and 10 yards south of cut in bank which is washing rapidly. Cement monument marking reference station is 8.42 meters S 56° 15′ W of station.

Marks.—Observed station is nail in cement in 6-inch tile pipe with top flush with ground. Reference station is center point of triangle on standard cement monument.

References.—

	°	′	″		
"Drum Point Light" (N 68° 07′ E)	0	00	00	------	2¾ miles.
Left tangent of trees on Hog Point	16	21	--	------	3¾ miles.
Near end of peak of roof of large 2½-story building at Pearsons	39	36	--	------	2¼ miles.
Near piazza post of Millstone Hotel	56	11	--	------	1¾ miles.
Chimney of Craddock house	60	28	--	------	1¼ miles.
Chimney on end of cabin	97	24	--	------	200 yards.
Tall pine tree	138	35	--	------	50 yards.
REFERENCE STATION	168	08	00	------	8.42 meters.
Nail in blaze in pine tree (4 inches diameter)	176	33	50	------	7.79 meters.
Nail in blaze in pine tree (4 inches diameter)	223	40	40	------	8.77 meters.

	°	′	″		
Nail in blaze in pine tree (4 inches diameter)	236	39	--	------	2.07 meters.
Near end of peak of roof of Marburger house	272	12	--	------	2 miles.
"Catholic Church Cross"	304	54	40	------	1½ miles.
"Bareda House Cupola"	350	34	40	------	2½ miles.

CRADDOCK.

General locality.—Southern shore of Patuxent River, about 2⅜ miles south-southeast of Drum Point Light and ¼ mile west of Millstone Landing. (See Chart No. 20.)

Immediate locality.—Observed station is on lawn about 15 feet above high-water mark, about 10 yards south from top edge of bank, 15 yards from bottom edge of bank and fence, 30 yards east of extreme edge of point, 30 yards northeast of trees along shore of pond, about 110 yards northwest of Craddock house and several outbuildings among poplar trees, 50 yards east of fence, and 70 yards west of driveway to house.

Marks.—Observed station is center point of triangle on standard cement monument, with top flush with lawn.

References.—

	°	′	″		
"Drum Point Light" (N 37° 15′ E)	0	00	00	------	2½ miles.
Left tangent of woods on Carroll Point	21	52	--	------	1¾ miles.
Near end of peak of roof of 2½-story building at Pearsons	42	25	--	---	1¼ miles.
Chimney on hotel at Millstone	64	56	--	------	½ mile.
Cottonwood tree (14 inches diameter)	68	54	--	------	80 yards.
Chimney on roof of Craddock 2½-story house	95	27	--	------	110 yards.
Nail in stump (14 inches diameter)	309	25	50	------	5.35 meters.
"Fishstack"	317	30	50	------	2 miles.

CARROLL 2.

General locality.—South side of Patuxent River, about 1 mile south-southwest of Hog Point and about 1 mile south of Drum Point Light. (See Chart No. 20.)

Immediate locality.—Observed station is on a sandy clay bluff in a cultivated field, about 50 feet above high-water mark, 4 feet south of top edge of bluff, 180 yards east of trees and ravine beyond cultivated field, 60 yards west of trees and ravine beyond cultivated field, 300 yards north of large square chimney on old-fashioned farmhouse, and 250 yards north of large tree to right of farmhouse. Cement monument marking reference station is 13.32 meters S 54° 30′ W of observed station. Another reference station is a nail in the east side of cement in a 6-inch tile pipe 14.64 meters S 13° 20′ E of observed station and on range with Drum Point Light.

Marks.—Observed station is center of 5-inch tile pipe with top 8 inches below surface of ground. Reference station is nail in cement on east side of a 6-inch tile pipe with top 6 inches below surface of ground. Another reference station is center point of triangle on standard cement monument with top 9 inches below surface of ground.

References.—

	°	′	″		
"Drum Point Light" (N 13° 20′ W)	0	00	00	------	1 mile.
Left tree on Hog Point	81	59	40	------	1 mile.
Right of bushes at edge of ravine	142	00	--	------	75 yards
Tree (12 inches diameter)	164	48	--	------	⅛ mile.
REFERENCE STATION (tile)	179	59	45	------	14.64 meters
Tree (20 inches diameter)	183	25	--	------	⅛ mile.
Chimney of Susquehanna farmhouse	192	10	--	------	300 yards.
Large tree	199	08	--	------	250 yards.
REFERENCE STATION (monument)	247	50	00	------	13.32 meters.
Right chimney of Fenner Lee house	302	45	--	------	4½ miles.

	°	′	″		
Center of four-sided roof on Doctor Marsh house	307	58	--	------	2¼ miles.
"Catholic Church Cross"	315	32	00	------	2¾ miles.
Silver tip on tower of Vale house	316	15	30	------	3 miles.
Chimney of Bowen house	327	16	--	------	2 miles.
"Bareda House Cupola"	348	44	00	------	1½ miles.

HOG 2.

General locality.—Southern shore of entrance to Patuxent River on Hog Point, about 1⅞ miles west-northwest of Cedar Point Light. (See Chart No. 20.)

Immediate locality.—Observed station is on a sand beach at high-water mark, 30 yards northwest of point of woods, and 200 yards north-northeast of nearest shore of Parsons Creek. Cement monument marking reference station is 33.35 meters S 42° 22′ E of observed station on a point of high land.

Marks.—Observed station is nail set in cement in a 6-inch tile pipe, with top 1 foot below the surface. Reference station is center point of triangle on standard cement monument.

References.—	°	′	″		
"Drum Point Light" (N 60° 44′ W)	0	00	00	------	1¼ miles.
"Bareda House Cupola"	2	44	50	------	1½ miles.
Chimney of cabin on opposite shore	22	20	--	------	1½ miles.
Tangent of Little Cove Point	71	56	--	------	3½ miles.
"Cedar Point Light"	173	31	40	------	2 miles.
REFERENCE STATION	198	21	50	------	33.35 meters.
Nail in blaze in pine tree	201	03	--	------	29.58 meters.
Cabin on opposite side of Parsons Creek	243	05	--	------	¾ mile.
Chimney on Susquehanna farmhouse	301	04	--	------	1 mile.
"M. E. Church" (Solomons)	346	16	40	------	3½ miles.
Steeple of Vale house at Avondale	350	55	--	------	3½ miles.

PAT.

General locality.—Western shore of Chesapeake Bay on Little Cove Point, about 1¾ miles south by west of Cove Point Light. (See Chart No. 20.)

Immediate locality.—Observed station is on the highest point of a thickly wooded bluff, about 75 feet above high-water mark, 4 yards west of edge of bluff, and 15 yards southwest of extreme point. Cement monument marking reference station is 24.57 meters S 71° 26′ W of observed station.

Marks.—Observed station is a 3-inch round stake set in cement, with top about 4 inches above surface of ground. Reference station is center point of triangle on standard cement monument.

References.—	°	′	″		
"Cedar Point Light" (S 13° 54′ E)	0	00	00	------	4½ miles.
Near piazza post of house	14	52	--	------	4 miles.
REFERENCE STATION	85	20	00	------	24.57 meters.
Spike in blaze in tree (5 inches diameter)	94	51	--	------	6.54 meters.
Spike in blaze in tree (5 inches diameter)	114	10	--	------	3.42 meters.
Spike in blaze in tree (17 inches diameter)	138	54	--	------	12.26 meters.
Spike in blaze in tree (13 inches diameter)	181	46	--	------	5.50 meters.
"Cove Point Light"	203	25	30	------	1¾ miles.
"Hoopers Island Light"	327	58	10	------	10¼ miles.

CEDAR POINT LIGHT.

General locality.—Western shore of Chesapeake Bay on Cedar Point, 3¼ miles east-southeast of Drum Point Light and 6 miles south by east of Cove Point Light. (See Chart No. 20.)

Immediate locality.—Observed station is on a brick dwelling known as Cedar Point Light-House.

Marks.—Observed station is center point of lantern on Cedar Point Light-House

Reference.—	°	′	″		
"Cove Point Light" (N 7° 16′ W)	0	00	00	------	6 miles.

CAIN.

General locality.—Western shore of Chesapeake Bay, about 1⅝ miles southwest of Cedar Point Light. (See Chart No. 20.)

Immediate locality.—Observed station is on a bank about 5 feet above high-water mark, about 20 yards northwest of ordinary high water, 5 yards northwest of extreme high water, 100 yards south-southwest of old-fashioned house among several large trees, and about 250 yards below small wharf and canning house. Cement monument marking reference station is 6.45 meters N 16° 56′ E of observed station.

Marks.—Observed station is a nail set in cement in a 3-inch pipe with top about 2 inches above ground. Reference station is center point of triangle on standard cement monument.

References.—	°	′	″		
"Cedar Point Light" (N 46° 45′ E)	0	00	00	------	1⅝ miles.
Steeple on church	28	26	--	------	9½ miles.
"Hoopers Island Light"	56	28	40	------	7¾ miles.
"Point No Point Light"	106	05	--	------	11¾ miles.
Right chimney on Tarleton house	135	12	--	------	3¼ miles.
Near end of peak of 2-story house	148	41	--	------	1¾ miles.
REFERENCE STATION	330	10	40	------	6.45 meters.
Near corner of house	335	13	--	------	100 yards.
Aspen tree in house yard	339	35	50	------	100 yards.

DESERT.

General locality.—Western shore of Chesapeake Bay, about 3 miles south-southwest of Cedar Point Light. (See Chart No. 20.)

Immediate locality.—Observed station is on sand and grass land, about 25 yards west from ordinary high-water mark, about at level of extreme high-water mark, 40 yards south of a fence, 10 yards east of a fence, 45 yards south of a creek, about 50 yards north of point of pine woods, and about 300 yards east of woods across marsh. Cement monument marking reference station is 5.29 meters N 31° 24′ W of observed station.

Marks.—Observed station is a 4-inch tile pipe projecting about 2 inches above surface of sand. Reference station is center point of triangle on standard cement monument.

References.—	°	′	″		
"Cedar Point Light" (N 34° 05′ E)	0	00	00	------	3 miles.
Steeple on church	34	19	40	------	10½ miles.
"Hoopers Island Light"	59	08	40	------	8 miles.
"Point No Point Light"	113	27	30	------	11 miles.
Near end of peak of roof of Tarleton house	135	09	--	------	2 miles.
Point of woods	146	00	--	------	50 yards.
Nail in blaze in pine tree (14 inches diameter)	294	30	40	------	7.62 meters.
REFERENCE STATION	294	30	40	------	5.29 meters
Chimney on near end of house	336	38	--	------	½ mile.
Large square chimney on larger of two houses	344	48	--	------	1 mile.

BOUNDARIES OF OYSTER BARS.

EXPLANATION.

The law of the United States authorizing the cooperation of the Department of Commerce and Labor in the survey of natural oyster bars of Maryland provides for the designation and employment by the Department of Commerce and Labor of such officers, experts, and other technically qualified persons "as may be necessary to cooperate with the Maryland State Board of Shell Fish Commissioners in making a survey of and locating the natural oyster beds, bars, and rocks in the waters within the State of Maryland." The oyster laws of Maryland provide that the Maryland Shell Fish Commissioners, with the aid of such persons as may be designated by the Government, shall proceed "to have laid out, surveyed, and designated on the said charts the natural beds and bars, and shall cause to be marked and defined as accurately as practicable the limits and boundaries of the natural beds, bars, and rocks as established by said survey, and they shall take true and accurate notes of said survey in writing, and make an accurate report of said survey, setting forth such a description of landmarks as may be necessary to enable the said board, or their successors, to find and ascertain the boundary lines of the said natural oyster beds, bars, and rocks, as shown by a delineation on the maps and charts." The oyster laws of Maryland also provide in another section that there shall "be made a true and accurate survey of the natural oyster beds, bars, and rocks * * * with reference to fixed and permanent objects on the shore, giving courses and distances, to be fully described and set out in a written report of said survey."

Under the provisions of the laws quoted above the State of Maryland, in cooperation with the Department of Commerce and Labor, must define the boundaries of the natural oyster bars "as accurately as practicable" and also "with reference to fixed and permanent objects on the shore, giving courses and distances." The requirement of "as accurately as practicable" is easily fulfilled by definition of the location of the corners of the oyster bars by latitude and longitude. In fact, this method is probably the most satisfactory and accurate one that could be used for all purposes of legal definition or for relocation of the oyster-bar boundaries by competent engineers. Therefore the additional requirement of "giving courses and distances" is superfluous and is only fulfilled in the published definitions on account of the specific provisions of the law making it compulsory. This part of the description of boundaries has involved an immense amount of extra computations in order to prevent technical discrepancies between the latitude and longitude of a corner of an oyster bar and its distance and bearing from objects on shore of known latitude and longitude without adding anything to the accuracy and very little to the convenience of practical use of the descriptions of the oyster-bar boundaries.

As provided by law the boundaries of the oyster bars are all straight lines, but in the work already completed they have inclosed areas of all shapes from triangles to complicated 14-sided figures, and of all sizes from 4 acres to 7,548 acres. The sides have varied in length from 93 to 7,529 yards, and in some cases the corners of the boundaries have been practically at the triangulation stations from which they are located, while in other instances they were over 13,600 yards from the landmarks most available for the purpose of fixing their position.

The varied characteristics of the legal boundaries of the oyster bars indicated by the above statement, together with the complicated requirements of the law under which the survey has been made and the magnitude of the work with the consequent need of fixed and uniform methods, have made the problem of describing the boundaries one of considerable difficulty and great importance.

The boundaries of the oyster bars of Maryland, as established by the Shell Fish Commission and delineated on the Coast and Geodetic Survey charts and projections and on the leasing charts of the Commission, are technically defined and described by a method somewhat different from that used in other oyster surveys. But it is believed that the forms finally adopted will fulfill all needs of the survey for both the present and future.

METHOD OF DESCRIBING BOUNDARIES.

The descriptions have been arranged in tabular form, thus avoiding many hundred repetitions of the same words by making one explanation of the tables sufficient for all oyster bars in each county.

Title.—At the top of each tabular form is given the legal name of the oyster bar to be described, and the one by which it is known and designated in the published oyster records and on the oyster charts. The adopted name of the oyster bar is the one used locally, as nearly as could be ascertained by the hydrographic engineer of the Commission; and when there was no local name in common use a name was selected from one of the prominent features of the vicinity that would naturally suggest the section of the waters where the oyster bar was located.

Underneath the name, in parenthesis, is given the general locality of the oyster bar and the serial number of the "Maryland Oyster Chart" on which its legal boundaries are shown.[a]

First column.—This column, under the heading of "Corner of bar," gives the number corresponding to the corner of the boundary as shown on the charts and to the number on the buoy marking the actual corner of the bar. The numbers of the corners have been assigned by naming the southernmost point No. 1, thence proceeding in a clockwise direction around the bar; but where a corner of one oyster bar is identical with the corner of the boundaries of one or more other oyster bars only the number of the corner of the oyster bar being described in the table is given in this column.

Second and third columns.—These two columns, under the headings of "Latitude" and "Longitude," give the geographic positions of the corners. These positions have been adopted by the Commission as the primary technical definition of the location of the corners, and should be considered as final in case of a dispute arising from discrep-

[a] These charts can be obtained by application to the Superintendent of the Coast and Geodetic Survey at Washington, D. C.

ancies caused by other means of location. The latitudes and longitudes given in these columns are based on the United States standard datum of the Coast and Geodetic Survey, and the points thus defined can be relocated from distant triangulation stations of the Survey, even though all the landmarks and buoys originally used for their location have been destroyed by natural or other causes.

Fourth and fifth columns.—These two columns, under the general heading of "True bearing"[a] and the specific headings "Forward" and "Back," give bearings measured from a true north-and-south line. The three "Forward" bearings are from the corner of the boundary designated in the first column to the triangulation stations named on the corresponding lines in the last column, and the three "Back" bearings are from these same stations in the last column to the corresponding corner of boundary in the first column. The difference in minutes of arc between the forward and back bearings shown in some cases is actual and not accidental, and is due to the fact that the computations took into account the spheroidal shape of the earth.

Sixth column.—This column, under the heading of "Distance," gives the three computed distances in yards from the corner of the bar noted in the first column to the three triangulation stations named on the corresponding lines in the last column, and vice versa.

Seventh column.—This column, under the heading of "U. S. C. & G. S. triangulation station,"[b] gives the names of the landmarks from which were computed the corresponding "Latitude," "Longitude," "True bearing," and "Distance" of the "Corner of the bar" designated in the first column. A full description of the location and markings of these triangulation stations is given in another part of this publication under the heading of "Descriptions of triangulation stations."

SURVEYING METHODS FOR RELOCATION OF BOUNDARIES.

There are a number of methods that can be used in the relocation of the actual boundaries of the natural oyster bars as technically described in this publication and delineated on the published charts of the Coast and Geodetic Survey and the leasing charts of the Shell Fish Commission.

The following brief descriptions of five of these more or less different methods assume a certain amount of experience and knowledge on the part of the engineer in the particular kind of surveying under consideration, and are only intended as reminders of ways and means that can be used.

There are two problems that are likely to present themselves to those interested in the boundaries of natural oyster bars: One, to determine whether the buoys marking the corners have been dragged or otherwise moved from their correct positions, and the other, to relocate or reestablish a buoy at the point from which it was removed. The different ways of solving these two problems partly depend upon the instruments possessed by the engineer and his assistants and partly on his training and experience.

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[a] The mean magnetic variation for Calvert County was 5° 50′ west of north in 1909 and increasing at the rate of 3′ yearly.

[b] Geographic positions of these triangulation stations can be obtained by application to the Superintendent of the Coast and Geodetic Survey, Washington, D. C.

(1) *Triangulation.*—This method is the one that will give the greatest accuracy, but on account of its requiring special data and instruments, and being an operation rarely used by engineers not engaged in geodetic surveying, it is recommended only for cases in dispute that can not be settled satisfactorily by some other method. An explanation of this class of work would be too long for a report of this sort, and those not familiar with this method are referred to the publications on the subject by the Coast and Geodetic Survey.

(2) *Hydrographic.*—This method is the most simple and satisfactory one that can be adopted if the surveyor can obtain the use of the necessary instruments and assistants. It is the one best suited for the work of the engineers of the Commission in relocating corners of boundaries, as it gives results of the accuracy ordinarily required and is rapid in execution. Besides, it has the advantage of being available whenever three triangulation stations of suitable relative positions are visible from the offshore points needing relocation.

Most navigators and others familiar with the use of a sextant are well acquainted with the graphic three-point method of fixing a position on water, and only a brief description of the operation will be stated.

In the case where there is only one engineer having a single sextant, the three-point method can be used if the two angles determining the position of a buoy are first derived from the "Forward" bearings given in the tabular forms describing the boundaries of the oyster bars. For example, take "Hog Point" bar, which is the first one described in this publication, and assume that "Corner No. 1" is to be examined as to its position. The angle between the two landmarks "Hog Point" and "Beach," as determined from right to left from the forward bearings from this corner is 67° 35′ and the angle between "Beach" and "Ill 2" is 17° 16′. Having these two angles, the engineer proceeds to the buoy of doubtful location and measures the actual sextant angles between the landmarks for which the calculations were made. If the measured and calculated angles do not agree the buoy is not in its correct position and the boundary corner must be relocated. This is accomplished by moving the boat about until a point is reached where the angles do agree, and this point being the desired location the buoy can be placed in its correct position.

If the engineer can obtain the use of both a sextant and a three-arm protractor ("position finder"), the availability of the hydrographic method is increased, as the use of the protractor is essential in case of the washing away or destruction of one or more of the landmarks originally used in describing the boundaries. Under these circumstances, any three landmarks of suitable relative position that are visible from the point to be located can be utilized. For example, the engineer can proceed to the buoy of doubtful position and measure the two adjacent sextant angles between the three landmarks selected. These two angles are set off on the three-arm protractor and the actual position of the buoy plotted on the chart by shifting the protractor about until the edge of each of the three arms passes through the center of the symbols on the chart marking the position of the three landmarks selected. The center of the hub of the protractor will indicate on the chart the actual position of the buoy, and if the

point thus obtained does not coincide with the true position of the corner of the boundary as given on the chart the surveyor can proceed to locate the buoy correctly by reversing the operation. This is done by placing the center point of the hub of the protractor over the corner of the boundary in question and measuring on the chart the two adjacent protractor angles between the three selected landmarks. One of the angles thus obtained is set on the sextant and the boat moved about until the two landmarks are shown by the sextant to subtend the same angle obtained from the protractor. The second angle is then placed on the sextant and the same operation gone through, and so on, first using one angle on the sextant, then the other, until a point is reached where both observed sextant angles are practically identical with the protractor angles. The point thus located is the desired one and the buoy can be placed to mark the true position of the corner of the boundary in question.

If the engineer possesses two sextants and a protractor this problem is far easier of solution, as the two angles can be set off on separate sextants and the observer can quickly find the desired point where they agree with the protractor angles by using one sextant after the other without the need of resetting either.

If there are two observers two sextants, and a protractor, it can be seen that the best conditions for both rapid and accurate hydrographic locations of points are attained; in fact, this is the method by which the buoys at the corners of the boundaries were originally placed by the hydrographic engineer to the Commission.

(3) *Magnetic bearings from offshore.*—This method of fixing a position on water is a simple and well-known one in navigation. It is available to anyone having a boat compass, and will be of special use to the State Fishery Force in investigating cases where buoys are supposed to have been moved for illegal purposes.

In the case where a buoy is supposed to have been moved from its true position the observer takes compass bearings to the three landmarks given in the last column of the tables opposite the boundary corner in question. These bearings are then corrected for the local declination,[a] and if the results agree with the published bearings the buoy is correctly located.

In the case where the buoy is not in its correct position, or has disappeared altogether, the desired point can be determined by maneuvering the vessel until the corrected bearings agree with the ones in the tabular descriptions, when the buoy can be anchored in its proper location.

In the case where the landmarks for which the bearings are published have been destroyed or washed away, any landmarks whose positions are indicated on the charts can be used by getting their bearings directly from the chart by parallel rulers or a protractor and then applying them in the same manner as the ones published in the tables.

(4) *Magnetic bearings from shore.*—This method will be of special value to engineers having an ordinary surveyor's compass. The compass can be set over the point marking a "triangulation station" on shore, the name of which is given in the last column

[a] The mean magnetic variation for Calvert County is 5° 50′ west of north in 1909 and increasing at the rate of 3′ yearly.

opposite the "corner" in question. The instrument is then set at the corresponding "back" bearing (corrected for local magnetic declination) given in the fifth column of the tables opposite the "corner" in question, and the direction thus determined will give one range on which the desired point must be located. The compass can then be moved to a second triangulation station and another range located in a similar manner. The intersection of these two range lines will give the desired point; but in general it should be checked by an additional range line determined from a third station.

(5) *Horizontal angles measured at landmarks.*—This process is a modification of the triangulation method, and will be useful to engineers who have a transit and desire considerable accuracy.

The instrument is placed over a "triangulation station," the name of which appears in the last column of the tabular description opposite the "corner" in question. The telescope is then pointed to the landmark indicated in the "Descriptions of landmarks" as having a direction of 0° 00′ 00″ from the triangulation station being occupied by the transit. The tabular description of the boundaries is next examined and the "back" bearing of the questionable boundary "corner" from the landmark being occupied is taken out. The angle calculated from this "back" bearing and the bearing given in parenthesis alongside the zero landmark in the "Descriptions of landmarks" is then set off on the transit, and a range line established on which the desired point must be located. A similar process is then carried on at a second station, and so on until the position of the buoy is satisfactorily fixed.

BOUNDARIES OF NATURAL OYSTER BARS.

HOG POINT.

(*Chesapeake Bay—Chart No. 16.*)

Corner of bar	Latitude	Longitude	True bearing		Distance	U. S. C. & G. S. triangulation station
			Forward	Back		
	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 42 00.00	76 29 42.57	N 65 49 W	S 65 50 E	3489	Hog Point (Holland 3).
			S 46 36 W	N 46 35 E	4709	Beach.
			S 29 20 W	N 29 19 E	6294	Ill 2.
2	38 42 00.00	76 30 38.41	N 50 04 W	S 50 04 E	2227	Hog Point (Holland 3).
			S 31 01 W	N 31 00 E	3776	Beach.
			S 16 19 W	N 16 19 E	5717	Ill 2.
3	38 42 39.59	76 30 41.04	N 86 42 W	S 86 43 E	1640	Hog Point (Holland 3).
			S 22 19 W	N 22 18 E	4941	Beach.
			S 12 42 W	N 12 41 E	6994	Ill 2.
4	38 42 30.67	76 29 56.13	N 82 02 W	S 82 03 E	2852	Hog Point (Holland 3).
			S 35 39 W	N 35 38 E	5255	Beach.
			S 22 41 W	N 22 40 E	7068	Ill 2.

UPPER STEPS.

(*Chesapeake Bay—Chart No. 16.*)

Corner of bar	Latitude	Longitude	True bearing: Forward	True bearing: Back	Distance	U. S. C. & G. S. triangulation station
	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 40 31.72	76 31 22.80	N 6 56 W	S 6 56 E	4429	Hog Point (Holland 3)
			S 71 26 W	N 71 26 E	815	Beach.
			S 9 47 W	N 9 47 E	2547	Ill 2.
2	38 41 07.90	76 31 23.42	N 9 14 W	S 9 14 E	3228	Hog Point (Holland 3).
			S 27 03 W	N 27 03 E	1661	Beach.
			S 6 22 W	N 6 22 E	3753	Ill 2.
3	38 41 07.81	76 30 43.13	N 26 23 W	S 26 24 E	3561	Hog Point (Holland 3).
			S 50 58 W	N 50 58 E	2344	Beach.
			S 21 41 W	N 21 40 E	4011	Ill 2.
4	38 40 32.14	76 30 41.83	N 20 13 W	S 20 13 E	4681	Hog Point (Holland 3).
			S 81 37 W	N 81 36 E	1876	Beach.
			S 30 59 W	N 30 59 E	2945	Ill 2.

LOWER STEPS.

(*Chesapeake Bay—Chart No. 16.*)

	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 37 54.20	76 30 09.22	N 40 20 W	S 40 21 E	3676	Ill 2.
			S 47 33 W	N 47 33 E	1590	Plum 3.
			S 9 30 W	N 9 30 E	2967	Pier.
2	38 38 22.74	76 31 01.84	N 17 58 W	S 17 58 E	4299	Beach.
			N 28 13 W	S 28 14 E	2088	Ill 2.
			S 6 09 E	N 6 08 W	2047	Plum 3.
3	38 39 03.00	76 31 10.50	N 21 53 W	S 21 53 E	2944	Beach.
			N 57 35 W	S 57 35 E	898	Ill 2.
			S 7 31 E	N 7 31 W	3422	Plum 3.
4	38 39 03.40	76 30 40.60	N 34 46 W	S 34 47 E	3310	Beach.
			N 73 11 W	S 73 12 E	1619	Ill 2.
			S 5 53 W	N 5 53 E	3346	Plum 3.
5	38 38 00.00	76 29 21.95	N 54 19 W	S 54 20 E	4467	Ill 2.
			S 62 23 W	N 62 22 E	2735	Plum 3.
			S 29 09 W	N 29 08 E	3574	Pier.

PLUM POINT.

(Chesapeake Bay—Charts Nos. 16 and 17.)

Corner of bar	Latitude	Longitude	True bearing		Distance	U. S. C. & G. S. triangulation station
			Forward	Back		
	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 35 08.99	76 29 30.18	N 29 56 W	S 29 56 E	3052	Pier.
			S 36 34 W	N 36 33 E	2896	Pen.
			S 28 09 W	N 28 08 E	5177	Patch.
2	38 35 23.36	76 30 13.24	N 10 03 W	S 10 04 E	2194	Pier.
			S 14 27 W	N 14 27 E	5214	Patch.
			S 11 45 W	N 11 45 E	2871	Pen.
3	38 37 54.20	76 30 09.22	N 40 20 W	S 40 21 E	3676	Ill 2.
			S 47 33 W	N 47 33 E	1590	Plum 3.
			S 9 30 W	N 9 30 E	2967	Pier.
4	38 38 00.00	76 29 21.95	N 54 19 W	S 54 20 E	4467	Ill 2.
			S 62 23 W	N 62 22 E	2735	Plum 3.
			S 29 09 W	N 29 08 E	3574	Pier.
5	38 37 25.92	76 28 39.97	N 51 36 W	S 51 38 E	6048	Ill 2.
			S 88 05 W	N 88 03 E	3536	Plum 3.
			S 55 20 W	N 55 19 E	3467	Pier.
6	38 35 46.04	76 28 39.80	N 63 57 W	S 63 58 E	3178	Pier.
			S 40 33 W	N 40 32 E	4705	Pen.
			S 33 00 W	N 32 59 E	6932	Patch.

DADDIE DARE.

(Chesapeake Bay—Chart No. 17.)

	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 33 16.42	76 30 01.31	N 31 30 W	S 31 30 E	1724	Pen.
			S 64 35 W	N 64 34 E	1791	Patch.
			S 24 08 W	N 24 08 E	3575	Parker.
2	38 34 14.52	76 30 39.37	S 12 36 W	N 12 36 E	2795	Patch.
			S 12 22 E	N 12 22 W	501	Pen.
			N 3 56 E	S 3 56 W	4493	Pier.
3	38 34 54.39	76 30 39.16	S 8 36 W	N 8 35 E	4118	Patch.
			S 3 10 E	N 3 10 W	1836	Pen.
			N 5 38 E	S 5 38 W	3153	Pier.
4	38 34 33.11	76 29 58.02	N 11 31 W	S 11 32 E	3935	Pier.
			S 41 30 W	N 41 30 E	1491	Pen.
			S 26 57 W	N 26 56 E	3762	Patch.
5	38 33 40.94	76 29 34.95	N 68 05 W	S 68 06 E	1722	Pen.
			S 55 26 W	N 55 25 E	2812	Patch.
			S 27 51 W	N 27 50 E	4625	Parker.

GOVERNORS RUN.

(*Chesapeake Bay—Charts Nos. 17 and 18.*)

Corner of bar	Latitude	Longitude	True bearing		Distance	U. S. C. & G. S. triangulation station
			Forward	Back		
	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 30 13.36	76 29 52.52	N 30 13 W	S 30 13 E	3368	Parker.
			S 35 28 W	N 35 28 E	328	Run.
			S 18 47 E	N 18 46 W	3657	Poplar.
2	38 31 58.17	76 29 50.96	N 45 20 W	S 45 21 E	2660	Patch.
			S 70 15 W	N 70 14 E	1845	Parker.
			S 3 29 W	N 3 29 E	3808	Run.
3	38 31 58.03	76 29 13.54	N 56 58 W	S 56 59 E	3439	Patch.
			S 77 13 W	N 77 12 E	2796	Parker.
			S 17 51 W	N 17 51 E	3988	Run.
4	38 31 16.41	76 29 02.58	N 44 04 W	S 44 05 E	4563	Patch.
			N 75 25 W	S 75 27 E	3118	Parker.
			S 32 19 W	N 32 18 E	2831	Run.
5	38 31 01.16	76 29 38.60	N 30 20 W	S 30 20 E	4394	Patch.
			N 57 49 W	S 57 49 E	2439	Parker.
			S 16 34 W	N 16 34 E	1955	Run.
6	38 30 18.02	76 29 40.77	N 36 04 W	S 36 05 E	3407	Parker.
			S 49 47 W	N 49 47 E	656	Run.
			S 13 27 E	N 13 29 W	3722	Poplar.

EMANUEL.

(*Chesapeake Bay—Charts Nos. 17 and 18.*)

	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 28 19.22	76 28 25.90	N 34 45 W	S 34 46 E	4360	Run.
			N 70 56 W	S 70 56 E	1184	Poplar.
			S 32 20 E	N 32 20 W	2596	Flag Pond.
2	38 30 13.36	76 29 52.52	N 30 13 W	S 30 13 E	3368	Parker
			S 35 28 W	N 35 28 E	328	Run.
			S 18 47 E	N 18 46 W	3657	Poplar.
3	38 30 18.02	76 29 40.77	N 36 04 W	S 36 05 E	3407	Parker.
			S 49 47 W	N 49 47 E	656	Run.
			S 13 27 E	N 13 29 W	3722	Poplar.
4	38 30 35.16	76 29 01.32	N 54 30 W	S 54 31 E	3748	Parker.
			S 57 04 W	N 57 04 E	1843	Run.
			S 2 27 W	N 2 27 E	4202	Poplar.
5	38 28 53.66	76 28 01.74	N 52 14 W	S 52 15 E	3953	Run.
			S 66 15 W	N 66 14 E	1923	Poplar.
			S 12 34 E	N 12 34 W	3437	Flag Pond.

FLAG POND.

(*Chesapeake Bay—Chart No. 18.*)

Corner of bar	Latitude	Longitude	True bearing		Distance	U. S. C. & G. S. triangulation station
			Forward	Back		
	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 24 51.50	76 24 49.59	N 45 57 W	S 45 59 E	4058	Wilson 2.
			N 85 35 W	S 85 35 E	210	Point of Rocks.
			S 41 39 E	N 41 41 W	4564	Cove Point Light.
2	38 25 18.03	76 25 24.78	S 39 30 E	N 39 30 W	1138	Point of Rocks.
			N 56 55 E	S 56 58 W	10684	Travers 2.
			N 45 50 W	S 45 51 E	2766	Wilson 2.
3	38 25 33.97	76 25 40.16	S 38 39 E	N 38 38 W	1813	Point of Rocks.
			N 60 30 E.	S 60 33 W	10755	Travers 2.
			N 48 37 W	S 48 37 E	2101	Wilson 2.
4	38 26 04.98	76 26 19.20	S 41 22 E	N 41 22 W	3280	Point of Rocks.
			N 67 45 E	S 67 49 W	11230	Travers 2.
			N 57 35 W	S 57 35 E	641	Wilson 2.
5	38 26 23.49	76 26 48.62	S 40 29 E	N 40 29 W	370	Wilson 2.
			N 72 01 E	S 72 05 W	11749	Travers 2.
			N 34 52 W	S 34 53 E	2082	Flag Pond.
6	38 26 53.57	76 26 51.50	N 58 04 W	S 58 05 E	1312	Flag Pond.
			S 13 41 E	N 13 41 W	1333	Wilson 2.
			S 36 25 E	N 36 24 W	5095	Point of Rocks.
7	38 27 01.36	76 26 35.34	N 74 22 W	S 74 23 E	1600	Flag Pond.
			S 4 08 W	N 4 08 E	1562	Wilson 2.
			S 30 45 E	N 30 44 W	5076	Point of Rocks.
8	38 26 32.14	76 25 46.03	N 63 34 W	S 63 35 E	3183	Flag Pond.
			S 68 03 W	N 68 02 E	1531	Wilson 2.
			S 20 52 E	N 20 53 W	3614	Point of Rocks.
9	38 26 06.70	76 25 54.97	N 48 57 W	S 48 58 E	3465	Flag Pond.
			N 76 27 W	S 76 27 E	1217	Wilson 2.
			S 31 11 E	N 31 11 W	2945	Point of Rocks.
10	38 24 54.58	76 24 44.12	N 48 24 W	S 48 25 E	4094	Wilson 2.
			S 76 07 W	N 76 07 E	365	Point of Rocks.
			S 39 25 E	N 39 24 W	4548	Cove Point Light.

SPOUT.

(*Upper Patuxent River—Chart No. 19.*)

Corner of bar	Latitude	Longitude	True bearing		Distance	U. S. C. & G. S. triangulation station
			Forward	Back		
	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 30 42.61	76 39 57.79	N 69 04 W	S 69 04 E	792	City.
			S 60 58 W	N 60 57 E	1391	Indian.
			S 7 32 E	N 7 32 W	348	Hallowing.
2	38 30 45.02	76 40 05.13	N 69 42 W	S 69 42 E	581	City.
			S 53 28 W	N 53 28 E	1269	Indian.
			S 29 23 E	N 29 23 W	489	Hallowing.
3	38 30 53.38	76 39 57.79	N 26 50 W	S 26 51 E	1594	Teague.
			S 83 48 W	N 83 48 E	744	City.
			S 3 51 E	N 3 51 W	710	Hallowing.
4	38 30 50.86	76 39 49.62	N 31 54 W	S 31 54 E	1772	Teague.
			N 89 43 W	S 89 44 E	956	City.
			S 15 20 W	N 15 20 E	646	Hallowing.

HOLLAND POINT (CALVERT COUNTY).

(*Upper Patuxent River—Chart No. 19.*)

	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 30 12.18	76 40 15.63	S 52 45 E	N 52 45 W	943	Dwarf.
			N 37 20 E	S 37 20 W	856	Hallowing.
			N 64 34 W	S 64 34 E	820	Indian.
2	38 30 29.62	76 40 20.02	N 81 39 E	S 81 40 W	641	Hallowing.
			N 11 47 W	S 11 48 E	736	City.
			S 69 19 W	N 69 19 E	667	Indian.
3	38 30 45.02	76 40 05.13	N 69 42 W	S 69 42 E	581	City.
			S 53 28 W	N 53 28 E	1269	Indian.
			S 29 23 E	N 29 23 W	489	Hallowing.
4	38 30 15.20	76 39 56.94	N 2 17 E	S 2 17 W	580	Hallowing.
			N 78 33 W	S 78 33 E	1262	Indian.
			S 20 46 E	N 20 46 W	720	Dwarf.

BUZZARD ISLAND.

(Upper Patuxent River—Chart No. 19.)

Corner of bar	Latitude	Longitude	True bearing		Distance	U. S. C. & G. S. triangulation station
			Forward	Back		
	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 28 55.15	76 39 26.67	N 18 46 E	S 18 46 W	1135	Buzz.
			S 81 44 W	N 81 44 E	933	Billiard.
			S 39 30 W	N 39 30 E	888	Trent.
	Thence along county boundary as delineated on Chart No. 19 to corner No. 2.					
2	38 29 34.74	76 39 54.78	N 15 53 E	S 15 53 W	720	Dwarf.
			S 76 27 W	N 76 27 E	561	Sothoron.
			S 6 50 W	N 6 50 E	1479	Billiard.
3	38 29 43.62	76 39 49.40	N 7 58 E	S 7 58 W	396	Dwarf.
			S 57 50 W	N 57 50 E	809	Sothoron.
			S 10 13 W	N 10 13 E	1792	Billiard.
4	38 29 02.08	76 39 12.63	S 45 34 W	N 45 33 E	1312	Trent.
			S 58 59 E	N 58 58 W	643	Morsel.
			N 0 27 W	S 0 27 E	844	Buzz.

MACKS HOLLOW.

(Upper Patuxent River—Chart No. 19.)

	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 28 36.57	76 39 11.00	N 43 51 E	S 43 51 W	733	Morsel.
			S 86 34 W	N 86 34 E	982	Trent.
			S 33 48 W	N 33 47 E	1088	Collins.
2	38 28 47.06	76 39 18.24	S 62 23 W	N 62 23 E	890	Trent.
			S 18 11 W	N 18 11 E	1324	Collins.
			N 75 58 E	S 75 58 W	722	Morsel.
3	38 28 49.60	76 39 12.42	S 62 09 W	N 62 09 E	1066	Trent.
			S 22 54 W	N 22 54 E	1459	Collins.
			N 80 42 E	S 80 42 W	553	Morsel.
4	38 28 39.34	76 39 05.24	N 39 13 E	S 39 13 W	562	Morsel.
			S 82 21 W	N 82 21 E	1143	Trent.
			S 37 08 W	N 37 07 E	1255	Collins.

BROAD NECK (CALVERT COUNTY).

(*Upper Patuxent River—Chart No. 19.*)

Corner of bar	Latitude	Longitude	True bearing: Forward	True bearing: Back	Distance	U. S. C. & G. S. triangulation station
	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 27 41.18	76 39 00.00	N 26 03 E	S 26 03 W	848	Sheridan.
			N 42 57 W	S 42 57 E	1317	Collins.
			S 54 49 W	N 54 49 E	952	Cremona.
Thence along county boundary as delineated on Chart No. 19 to corner No. 2.						
2	38 28 00.34	76 39 09.64	N 63 40 W	S 63 41 E	715	Collins.
			S 23 40 W	N 23 40 E	1304	Cremona.
			N 79 34 E	S 79 34 W	639	Sheridan.
3	38 28 03.12	76 38 52.86	N 78 22 W	S 78 23 E	1109	Collins.
			S 36 56 W	N 36 56 E	1611	Cremona.
			N 83 10 E	S 83 10 W	184	Sheridan.
4	38 27 45.22	76 38 51.22	N 12 36 E	S 12 36 W	640	Sheridan.
			N 53 47 W	S 53 48 E	1400	Collins.
			S 55 56 W	N 55 56 E	1222	Cremona.

THOMAS (CALVERT COUNTY).

(*Upper Patuxent River—Chart No. 19.*)

	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 27 12.58	76 38 14.84	N 61 07 E	S 61 07 W	1561	Kitt.
			N 25 33 W	S 25 33 E	1914	Sheridan.
			S 49 29 W	N 49 29 E	1018	Oppkit.
Thence along county boundary as delineated on Chart No. 19 to corner No. 2.						
2	38 27 41.18	76 39 00.00	N 26 03 E	S 26 03 W	848	Sheridan.
			N 42 57 W	S 42 57 E	1317	Collins.
			S 54 49 W	N 54 49 E	952	Cremona.
3	38 27 45.22	76 38 51.22	N 12 36 E	S 12 36 W	640	Sheridan.
			N 53 47 W	S 53 48 E	1400	Collins.
			S 55 56 W	N 55 56 E	1222	Cremona.

KITTS MARSH.

(*Upper Patuxent River—Chart No. 19.*)

	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 26 48.30	76 37 38.66	N 88 44 E	S 88 44 W	1652	Battle.
			N 14 31 E	S 14 31 W	1625	Kitt.
			N 84 48 W	S 84 49 E	1740	Oppkit.
2	38 27 33.80	76 37 50.40	N 55 33 W	S 55 33 E	1786	Sheridan.
			S 45 55 W	N 45 55 E	1979	Oppkit.
			N 86 56 E	S 86 57 W	720	Kitt.
3	38 27 28.23	76 37 03.40	N 66 47 W	S 66 48 E	574	Kitt.
			S 65 59 W	N 65 58 E	2921	Oppkit.
			S 28 42 E	N 28 42 W	1493	Battle.
4	38 27 06.60	76 37 07.58	N 23 34 W	S 23 34 E	1042	Kitt.
			S 79 49 W	N 79 48 E	2598	Oppkit.
			S 54 58 E	N 54 58 W	1010	Battle.

PRISON POINT.

(*Upper Patuxent River—Chart No. 19.*)

Corner of bar	Latitude	Longitude	True bearing		Distance	U. S. C. & G. S. triangulation station
			Forward	Back		
	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 26 06.26	76 36 55.93	S 89 58 E	N 89 57 W	2229	Photo.
			N 19 38 E	S 19 39 W	1544	Battle.
			S 77 55 W	N 77 55 E	1749	Fight.
2	38 26 48.30	76 37 38.66	N 88 44 E	S 88 44 W	1652	Battle.
			N 14 31 E	S 14 31 W	1625	Kitt.
			N 84 48 W	S 84 49 E	1740	Oppkit.
3	38 27 06.60	76 37 07.58	N 23 34 W	S 23 34 E	1042	Kitt.
			S 79 49 W	N 79 48 E	2598	Oppkit.
			S 54 58 E	N 54 58 W	1010	Battle.
4	38 26 25.18	76 36 32.36	S 68 15 E	N 68 15 W	1727	Photo.
			N 7 24 W	S 7 24 E	823	Battle.
			S 66 44 W	N 66 43 E	2542	Fight.

JACKS MARSH.

(*Middle Patuxent River—Chart No. 19.*)

	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 25 46.60	76 36 35.83	N 68 42 E	S 68 43 W	1820	Photo.
			N 0 23 W	S 0 23 E	2116	Battle.
			N 82 27 W	S 82 26 E	2263	Fight.
2	38 26 06.26	76 36 55.93	S 89 58 E	N 89 57 W	2229	Photo.
			N 19 38 E	S 19 39 W	1544	Battle.
			S 77 55 W	N 77 55 E	1749	Fight.
3	38 26 25.18	76 36 32.36	S 68 15 E	N 68 15 W	1727	Photo.
			N 7 24 W	S 7 24 E	823	Battle.
			S 66 44 W	N 66 43 E	2542	Fight.
4	38 26 11.08	76 36 20.38	S 82 43 E	N 82 43 W	1297	Photo.
			N 18 10 W	S 18 10 E	1359	Battle.
			S 78 44 W	N 78 43 E	2704	Fight.

JACKS BAY.

(*Middle Patuxent River—Chart No. 19.*)

Corner of bar	Latitude	Longitude	True bearing: Forward	True bearing: Back	Distance	U. S. C. & G. S. triangulation station
	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 24 44.96	76 34 54.62	N 23 28 E	S 23 28 W	1603	Slim.
			N 19 50 W	S 19 51 E	2912	Photo.
			N 87 57 W	S 87 58 E	2465	Forr.
2	38 25 33.46	76 36 05.82	S 20 22 W	N 20 22 E	1650	Forr.
			S 86 17 E	N 86 16 W	2533	Slim.
			N 39 11 E	S 39 11 W	1425	Photo.
3	38 25 46.40	76 35 49.42	S 26 59 W	N 26 58 E	2225	Forr.
			S 73 59 E	N 73 58 W	2177	Slim.
			N 34 50 E	S 34 51 W	814	Photo.
4	38 25 04.79	76 34 41.18	N 19 22 E	S 19 22 W	851	Slim.
			N 33 00 W	S 33 01 E	2469	Photo.
			S 78 23 W	N 78 22 E	2879	Forr.

PARKERS WHARF.

(*Middle Patuxent River—Chart No. 19.*)

	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 24 21.25	76 34 00.40	N 19 24 W	S 19 25 E	2407	Slim.
			S 70 07 W	N 70 06 E	2108	Cole.
			S 33 17 E	N 33 17 W	2561	Hutchins.
2	38 24 44.96	76 34 54.62	N 23 28 E	S 23 28 W	1603	Slim.
			N 19 50 W	S 19 51 E	2912	Photo.
			N 87 57 W	S 87 58 E	2465	Forr.
3	38 25 04.79	76 34 41.18	N 19 22 E	S 19 22 W	851	Slim.
			N 33 00 W	S 33 01 E	2469	Photo.
			S 78 23 W	N 78 22 E	2879	Forr.
4	38 24 31.32	76 33 54.75	N 26 11 W	S 26 12 E	2152	Slim.
			S 63 35 W	N 63 35 E	2381	Cole
			S 26 51 E	N 26 51 W	2781	Hutchins.

BROOME ISLAND.

(*Middle Patuxent River—Chart No. 19.*)

Corner of bar	Latitude	Longitude	True bearing: Forward	True bearing: Back	Distance	U. S. C. & G. S. triangulation station
	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 24 06.73	76 33 44.00	N 24 06 W	S 24 07 E	3024	Slim.
			S 84 38 W	N 84 37 E	2428	Cole.
			S 30 26 E	N 30 26 W	1916	Hutchins.
2	38 24 21.25	76 34 00.40	N 19 24 W	S 19 25 E	2407	Slim.
			S 70 07 W	N 70 06 E	2108	Cole.
			S 33 17 E	N 33 17 W	2561	Hutchins.
3	38 24 31.32	76 33 54.75	N 26 11 W	S 26 12 E	2152	Slim.
			S 63 35 W	N 63 35 E	2381	Cole.
			S 26 51 E	N 26 51 W	2781	Hutchins.
4	38 24 43.90	76 33 17.78	N 52 01 W	S 52 02 E	2449	Slim.
			S 64 34 W	N 64 33 E	3447	Cole.
			S 5 24 E	N 5 24 W	2918	Hutchins.
5	38 24 15.43	76 33 22.44	N 36 13 W	S 36 14 E	3058	Slim.
			S 80 06 W	N 80 05 E	3035	Cole.
			S 11 35 E	N 11 34 W	1985	Hutchins.

ISLAND CREEK.

(*Middle Patuxent River—Chart No. 19.*)

	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 24 00.18	76 32 37.18	N 36 43 E	S 36 43 W	1048	Island.
			N 11 45 W	S 11 46 E	1407	Sweep.
			S 29 18 W	N 29 18 E	1640	Hutchins.
2	38 24 21.82	76 32 54.59	S 8 58 W	N 8 58 E	2192	Hutchins.
			N 84 13 E	S 84 13 W	1089	Island.
			N 15 07 E	S 15 07 W	671	Sweep.
3	38 24 24.58	76 32 49.20	S 12 07 W	N 12 07 E	2305	Hutchins.
			N 88 57 E	S 88 58 W	946	Island.
			N 3 14 E	S 3 14 W	557	Sweep.
4	38 24 03.25	76 32 31.28	N 32 32 E	S 32 32 W	874	Island.
			N 19 12 W	S 19 12 E	1349	Sweep.
			S 32 01 W	N 32 01 E	1810	Hutchins.

PETERSON (CALVERT COUNTY).

(*Middle Patuxent River—Chart No. 19.*)

Corner of bar	Latitude	Longitude	True bearing: Forward	True bearing: Back	Distance	U. S. C. & G. S. triangulation station
	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 22 56.90	76 30 33.78	N 88 53 E	S 88 54 W	1920	Lend.
			N 55 05 E	S 55 05 W	1587	Sollers.
			N 13 16 E	S 13 16 W	1313	Wheat.
2	38 23 12.22	76 31 11.86	S 76 36 W	N 76 35 E	1669	Bars.
			S 0 30 W	N 0 30 E	1989	Stock.
			N 65 25 E	S 65 24 W	1126	Wheat.
Thence along county boundary as delineated on Chart No. 19 to corner No. 3.						
3	38 23 44.44	76 31 50.08	N 30 01 E	S 30 01 W	1818	Peak.
			N 24 27 W	S 24 27 E	1506	Island.
			S 22 47 W	N 22 47 E	1601	Bars.
4	38 24 08.86	76 31 20.50	S 41 01 E	N 41 01 W	1909	Wheat.
			N 9 26 E	S 9 26 W	759	Peak.
			N 68 46 W	S 68 46 E	1511	Island.
5	38 24 00.00	76 31 04.40	N 16 06 W	S 16 06 E	1093	Peak.
			S 42 29 W	N 42 29 E	2713	Bars.
			S 35 52 E	N 35 52 W	1410	Wheat.

MEARS (CALVERT COUNTY).

(*Lower Patuxent River—Chart No. 20.*)

	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 22 10.64	76 29 40.84	S 43 10 W	N 43 10 E	1491	Briscoe.
			S 58 24 E	N 58 24 W	1042	Stump.
			N 10 28 E	S 10 28 W	1251	Lend.
2	38 22 13.42	76 30 03.46	N 36 08 E	S 36 09 W	1403	Lend.
			S 89 59 W	N 89 59 E	1833	Stock.
			S 19 34 W	N 19 34 E	1251	Briscoe.
Thence along county boundary as delineated on Chart No 20 to corner No. 3.						
3	38 22 48.14	76 30 44.62	N 88 53 E	S 88 54 W	1920	Lend.
			N 55 05 E	S 55 05 W	1587	Sollers.
			N 13 16 E	S 13 16 W	1313	Wheat.
4	38 22 56.90	76 30 33.78	S 78 29 E	N 78 29 W	1666	Lend.
			N 58 50 E	S 58 50 W	1184	Sollers.
			N 0 47 E	S 0 47 W	985	Wheat.
5	38 22 24.02	76 29 34.47	N 4 17 E	S 4 17 W	779	Lend.
			S 37 42 W	N 37 42 E	1943	Briscoe.
			S 35 47 E	N 35 47 W	1229	Stump.
6	38 22 11.06	76 29 32.03	N 0 19 W	S 0 19 E	1213	Lend.
			S 48 42 W	N 48 42 E	1668	Briscoe.
			S 49 25 E	N 49 25 W	862	Stump.

HELLEN.

(*Lower Patuxent River—Chart No. 20.*)

Corner of bar	Latitude	Longitude	True bearing		Distance	U. S. C. & G. S. triangulation station.
			Forward	Back		
	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 21 13.82	76 29 19.73	S 88 22 E	N 88 21 W	1001	Hellen.
			N 13 27 E	S 13 27 W	1409	Stump.
			S 50 43 W	N 50 43 E	1172	Nat.
	Thence along county boundary as delineated on Chart No. 20 to corner No. 2.					
2	38 21 28.78	76 29 27.51	S 29 21 W	N 29 20 E	1430	Nat.
			S 66 10 E	N 66 10 W	1320	Hellen.
			N 31 41 E	S 31 42 W	1017	Stump.
3	38 21 43.02	76 29 17.82	S 29 02 W	N 29 01 E	1975	Nat.
			S 43 09 E	N 43 09 W	1389	Hellen.
			N 35 43 E	S 35 43 W	475	Stump.
4	38 22 10.64	76 29 40.84	S 43 10 W	N 43 10 E	1491	Briscoe.
			S 58 24 E	N 58 24 W	1042	Stump.
			N 10 28 E	S 10 28 W	1251	Lend.
5	38 22 11.06	76 29 32.03	N 0 19 W	S 0 19 E	1213	Lend.
			S 48 42 W	N 48 42 E	1668	Briscoe.
			S 49 25 E	N 49 25 W	862	Stump.
6	38 22 12.02	76 29 22.46	N 12 27 W	S 12 27 E	1208	Lend.
			S 53 04 W	N 53 03 E	1886	Briscoe.
			S 34 01 E	N 34 01 W	715	Stump.
7	38 21 35.98	76 28 55.14	N 27 35 W	S 27 35 E	702	Stump.
			S 46 20 W	N 46 19 E	2158	Nat.
			S 24 08 E	N 24 08 W	850	Hellen.
8	38 21 33.41	76 29 04.07	N 7 05 W	S 7 05 E	714	Stump.
			S 43 19 W	N 43 19 E	1929	Nat.
			S 40 19 E	N 40 18 W	903	Hellen.
9	38 21 16.78	76 28 52.37	N 17 26 W	S 17 26 E	1331	Stump.
			S 62 44 W	N 62 43 E	1838	Nat.
			S 64 53 E	N 64 53 W	303	Hellen.

HUNGERFORD HOLLOW.

(*Lower Patuxent River—Chart No. 20.*)

	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 20 03.38	76 28 46.62	N 38 28 E	S 38 29 W	1247	Ton.
			N 87 57 W	S 87 57 E	1223	Mill.
			S 36 39 W	N 36 39 E	514	Bur.
2	38 20 05.82	76 28 58.74	N 50 51 E	S 50 51 W	1415	Ton.
			S 87 33 W	N 87 33 E	901	Mill.
			S 1 47 E	N 1 47 W	494	Bur.
3	38 20 33.14	76 28 48.62	S 50 37 W	N 50 37 E	1512	Mill.
			S 10 09 W	N 10 09 E	1438	Bur.
			S 88 05 E	N 88 06 W	829	Ton.
4	38 20 30.18	76 28 36.35	S 60 06 W	N 60 05 E	1725	Mill.
			S 23 46 W	N 23 46 E	1437	Bur.
			N 81 50 E	S 81 50 W	507	Ton.

BARN GATES.

(*Lower Patuxent River—Chart No. 20.*)

Corner of bar	Latitude	Longitude	True bearing		Distance	U. S. C. & G. S. triangulation station
			Forward	Back		
	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 19 31.80	76 28 19.14	N 21 38 E	S 21 38 W	775	New.
			N 57 48 W	S 57 48 E	1225	Bur.
			S 37 50 W	N 37 50 E	547	Town.
Thence along county boundary as delineated on Chart No. 20 to corner No. 2.						
2	38 19 32.82	76 29 15.02	S 34 21 W	N 34 21 E	518	Cable.
			S 67 53 E	N 67 53 W	1240	Town.
			N 35 55 E	S 35 55 W	763	Bur.
Thence along county boundary as delineated on Chart No. 20 to corner No. 3.						
3	38 19 52.74	76 29 15.14	N 49 06 W	S 49 06 E	614	Mill.
			S 14 48 W	N 14 48 E	1137	Cable.
			S 83 16 E	N 83 16 W	454	Bur.
4	38 19 49.38	76 29 08.36	N 51 20 W	S 51 21 E	826	Mill.
			S 25 27 W	N 25 27 E	1093	Cable.
			N 78 19 E	S 78 19 W	277	Bur.
5	38 19 38.36	76 29 05.73	N 24 59 E	S 24 59 W	476	Bur.
			N 38 51 W	S 38 51 E	1140	Mill.
			S 41 16 W	N 41 15 E	818	Cable.
6	38 19 50.62	76 28 52.41	N 83 12 W	S 83 12 E	154	Bur.
			S 27 12 E	N 27 12 W	1198	Town.
			N 85 48 E	S 85 48 W	1173	New.
7	38 19 49.33	76 28 27.26	N 85 42 W	S 85 42 E	823	Bur.
			S 6 42 W	N 6 41 E	1030	Town.
			N 75 31 E	S 75 32 W	516	New.
8	38 19 44.56	76 28 13.36	N 24 30 E	S 24 30 W	319	New.
			N 79 24 W	S 79 25 E	1211	Bur.
			S 29 34 W	N 29 34 E	992	Town.
9	38 19 36.50	76 28 08.41	S 62 03 W	N 62 02 E	938	M. E. Church.
			S 88 20 E	N 88 20 W	743	Catholic Church Cross.
			N 0 05 E	S 0 05 W	562	New.

BACK OF ISLAND.

(*Lower Patuxent River—Chart No. 20.*)

Corner of bar	Latitude	Longitude	True bearing		Distance	U. S. C. & G. S. triangulation station
			Forward	Back		
	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 18 37.46	76 27 22.28	N 2 47 E	S 2 47 W	733	Sand.
			N 14 20 W	S 14 20 E	1601	M. E. Church.
			S 57 21 W	N 57 21 E	1309	Ben.
2	38 19 14.98	76 27 45.78	S 51 03 E	N 51 03 W	849	Sand.
			N 38 36 E	S 38 36 W	365	M. E. Church.
			N 11 22 E	S 11 22 W	718	Catholic Church Cross.
3	38 19 31.80	76 28 19.14	N 21 38 E	S 21 38 W	775	New.
			N 57 48 W	S 57 48 E	1225	Bur.
			S 37 50 W	N 37 50 E	547	Town.
4	38 19 36.50	76 28 08.41	S 62 03 W	N 62 02 E	938	M. E. Church.
			S 88 20 E	N 88 20 W	743	Catholic Church Cross.
			N 0 05 E	S 0 05 W	562	New.
5	38 19 17.36	76 27 40.64	S 40 27 E	N 40 27 W	807	Sand.
			N 23 59 E	S 23 59 W	224	M. E. Church.
			N 87 42 W	S 87 42 E	1359	Town.
6	38 18 43.78	76 27 17.52	N 9 56 W	S 9 56 E	526	Sand.
			N 58 57 W	S 58 58 E	2302	Town.
			S 53 12 W	N 53 11 E	1534	Ben.

SHELL PILE.

(*Lower Patuxent River—Chart No. 20.*)

	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 19 14.10	76 27 16.86	N 44 23 E	S 44 24 W	479	Fishstack.
			N 59 44 W	S 59 44 E	626	M. E. Church.
			S 3 19 W	N 3 19 E	156	K. of P. Flagstaff.
2	38 19 15.60	76 27 18.42	N 52 15 E	S 52 15 W	475	Fishstack.
			N 62 03 W	S 62 03 E	564	M. E. Church.
			S 8 56 E	N 8 56 W	209	K. of P. Flagstaff.
3	38 19 21.22	76 27 09.38	N 53 11 E	S 53 11 W	169	Fishstack.
			N 84 11 W	S 84 12 E	743	M. E. Church.
			S 27 40 W	N 27 40 E	447	K. of P. Flagstaff.
4	38 19 19.90	76 27 07.84	N 33 01 E	S 33 01 W	175	Fishstack.
			N 81 16 W	S 81 16 E	789	M. E. Church.
			S 35 12 W	N 35 12 E	431	K. of P. Flagstaff.

CHERRY TREE.

(*Lower Patuxent River—Chart No. 20.*)

Corner of bar	Latitude	Longitude	True bearing		Distance	U. S. C. & G. S. triangulation station
			Forward	Back		
	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 19 01.06	76 27 05.07	N 1 34 E	S 1 34 W	782	Fishstack.
			N 48 40 W	S 48 40 E	430	K. of P. Flagstaff.
			S 81 22 W	N 81 21 E	426	Sand.
2	38 19 09.49	76 27 01.33	N 8 54 W	S 8 54 E	503	Fishstack.
			N 89 55 W	S 89 55 E	422	K. of P. Flagstaff.
			S 56 14 W	N 56 13 E	627	Sand.
3	38 19 16.62	76 27 07.84	N 20 18 E	S 20 18 W	273	Fishstack.
			N 73 33 W	S 73 34 E	814	M. E. Church.
			S 45 53 W	N 45 53 E	347	K. of P. Flagstaff.
4	38 19 19.66	76 27 06.41	N 20 17 E	S 20 17 W	165	Fishstack.
			N 81 08 W	S 81 08 E	828	M. E. Church.
			S 39 50 W	N 39 50 E	447	K. of P. Flagstaff.
5	38 19 07.48	76 26 50.48	N 32 56 W	S 32 56 E	674	Fishstack.
			N 84 36 W	S 84 36 E	713	K. of P. Flagstaff.
			S 70 53 W	N 70 52 E	856	Sand.
6	38 19 03.43	76 26 59.69	N 9 49 W	S 9 49 E	712	Fishstack.
			N 66 21 W	S 66 21 E	507	K. of P. Flagstaff.
			S 75 42 W	N 75 41 E	583	Sand.

SWASH.

(*Lower Patuxent River—Chart No. 20.*)

Corner of bar	Latitude	Longitude	True bearing		Distance	U. S. C. & G. S. triangulation station
			Forward	Back		
	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 19 14.46	76 26 42.80	N 22 31 E	S 22 31 W	492	Bon.
			N 59 57 W	S 59 57 E	658	Fishstack.
			S 63 01 W	N 63 01 E	1134	Sand.
2	38 19 18.38	76 26 46.80	N 42 30 E	S 42 30 W	435	Bon.
			N 66 34 W	S 66 35 E	505	Fishstack.
			S 54 27 W	N 54 27 E	1114	Sand.
3	38 19 16.23	76 26 50.63	N 45 14 E	S 45 14 W	558	Bon.
			N 53 55 W	S 53 55 E	458	Fishstack.
			S 54 27 W	N 54 26 E	990	Sand.
4	38 19 19.66	76 26 53.64	N 59 43 E	S 59 43 W	551	Bon.
			N 61 18 W	S 61 18 E	322	Fishstack.
			S 61 14 W	N 61 14 E	714	K. of P. Flagstaff.
5	38 19 20.62	76 26 46.83	N 50 13 E	S 50 13 W	383	Bon.
			N 75 14 W	S 75 14 E	479	Fishstack.
			S 65 01 W	N 65 01 E	890	K. of P. Flagstaff.
6	38 19 24.62	76 26 40.42	N 48 24 E	S 48 24 W	166	Bon.
			S 88 50 W	N 88 50 E	633	Fishstack.
			S 62 24 W	N 62 24 E	1102	K. of P. Flagstaff.
7	38 19 15.46	76 26 35.24	N 77 13 E	S 77 13 W	1500	Bareda House Cupola.
			N 1 47 W	S 1 47 E	426	Bon.
			N 69 00 W	S 69 00 E	826	Fishstack.

SANDY POINT LUMPS.

(*Lower Patuxent River—Chart No. 20.*)

	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 18 32.95	76 26 56.30	N 65 07 E	S 65 08 W	2935	Drum Point Light.
			N 6 58 W	S 6 58 E	1742	Fishstack.
			N 36 32 W	S 36 32 E	1100	Sand.
2	38 19 01.06	76 27 05.07	N 1 34 E	S 1 34 W	782	Fishstack.
			N 48 40 W	S 48 40 E	430	K. of P. Flagstaff.
			S 81 22 W	N 81 21 E	426	Sand.
3	38 19 03.43	76 26 59.69	N 9 49 W	S 9 49 E	712	Fishstack.
			N 66 21 W	S 66 21 E	507	K. of P. Flagstaff.
			S 75 42 W	N 75 41 E	583	Sand.
4	38 18 38.82	76 26 36.60	N 64 08 E	S 64 09 W	2377	Drum Point Light.
			N 25 38 W	S 25 38 E	1698	Fishstack.
			N 59 48 W	S 59 48 E	1363	Sand.

SOUTHEAST MIDDLE-GROUND.

(*Lower Patuxent River—Chart No. 20.*)

Corner of bar	Latitude	Longitude	True bearing		Distance	U. S. C. & G. S. triangulation station
			Forward	Back		
	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 18 36.88	76 26 17.61	N 56 01 E	S 56 01 W	1972	Drum Point Light.
			N 15 38 W	S 15 38 E	1787	Bon.
			N 65 56 W	S 65 57 E	1843	Sand.
2	38 18 54.83	76 26 44.86	N 78 06 E	S 78 07 W	2410	Drum Point Light.
			N 12 16 E	S 12 16 W	1141	Bon.
			N 81 20 W	S 81 21 E	970	Sand.
3	38 19 03.18	76 26 40.68	N 84 31 E	S 84 32 W	2258	Drum Point Light.
			N 8 58 E	S 8 58 W	845	Bon.
			S 83 53 W	N 83 53 E	1076	Sand.
4	38 18 59.63	76 26 25.20	N 79 39 E	S 79 39 W	1867	Drum Point Light.
			N 16 21 W	S 16 21 E	993	Bon.
			S 89 23 W	N 89 23 E	1481	Sand.
5	38 19 07.06	76 26 07.32	N 86 27 E	S 86 27 W	1365	Drum Point Light.
			N 49 33 E	S 49 33 W	948	Bareda House Cupola.
			N 47 03 W	S 47 03 E	1031	Bon.
6	38 19 15.48	76 26 06.76	S 81 35 E	N 81 34 W	1362	Drum Point Light.
			N 64 53 E	S 64 53 W	781	Bareda House Cupola.
			N 61 27 W	S 61 27 E	876	Bon.
7	38 19 14.40	76 26 14.82	S 84 03 E	N 84 02 W	1569	Drum Point Light.
			N 67 52 E	S 67 52 W	994	Bareda House Cupola.
			N 50 40 W	S 50 40 E	718	Bon.
8	38 19 14.76	76 26 22.18	S 84 19 E	N 84 20 W	1765	Drum Point Light.
			N 71 57 E	S 71 57 W	1175	Bareda House Cupola.
			N 39 05 W	S 39 06 E	571	Bon.
9	38 19 23.38	76 26 16.02	S 73 42 E	N 73 42 W	1659	Drum Point Light.
			N 86 06 E	S 86 06 W	954	Bareda House Cupola.
			N 73 46 W	S 73 46 E	546	Bon.
10	38 19 23.77	76 25 52.60	S 63 44 E	N 63 44 W	1083	Drum Point Light.
			N 81 05 E	S 81 05 W	335	Bareda House Cupola.
			N 83 05 W	S 83 06 E	1154	Bon.
11	38 18 40.96	76 25 49.21	S 57 34 E	N 57 33 W	1547	Carroll 2.
			N 42 23 E	S 42 23 W	1306	Drum Point Light.
			N 9 08 E	S 9 08 W	1516	Bareda House Cupola.

LIGHT HOUSE LUMP.

(*Lower Patuxent River—Chart No. 20.*)

Corner of bar	Latitude	Longitude	True bearing		Distance	U. S. C. & G. S. triangulation station
			Forward	Back		
	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 18 50.42	76 25 42.82	S 44 41 E	N 44 40 W	1616	Carroll 2.
			N 47 44 E	S 47 45 W	960	Drum Point Light.
			N 3 27 E	S 3 27 W	1179	Bareda House Cupola
2	38 19 00.00	76 25 36.78	S 33 32 E	N 33 32 W	1766	Carroll 2.
			N 59 36 E	S 59 36 W	638	Drum Point Light.
			N 5 59 W	S 5 59 E	858	Bareda House Cupola.
3	38 19 00.00	76 25 21.67	S 21 19 E	N 21 19 W	1580	Carroll 2.
			N 24 45 E	S 24 45 W	355	Drum Point Light.
			N 29 54 W	S 29 55 E	984	Bareda House Cupola.
4	38 18 50.60	76 25 15.98	S 20 07 E	N 20 07 W	1230	Carroll 2.
			N 0 13 W	S 0 13 E	640	Drum Point Light.
			N 28 45 W	S 28 45 E	1335	Bareda House Cupola.

OLD LUMP.

(*Entrance Patuxent River—Chart No. 20.*)

	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 18 58.36	76 25 10.00	S 10 34 E	N 10 34 W	1441	Carroll 2.
			S 67 54 E	N 67 53 W	2014	Hog 2.
			N 23 46 W	S 23 46 E	411	Drum Point Light.
2	38 19 09.57	76 25 16.07	S 60 45 E	N 60 44 W	2324	Hog 2.
			S 13 21 E	N 13 20 W	1844	Carroll 2.
			S 83 58 W	N 83 57 E	3335	Sand.
3	38 19 10.57	76 25 02.48	S 84 40 W	N 84 39 E	363	Drum Point Light.
			S 2 01 E	N 2 01 W	1830	Carroll 2.
			S 54 56 E	N 54 56 W	2036	Hog 2.

CARROLL MUDS (CALVERT COUNTY).

(*Entrance Patuxent River—Chart No. 20.*)

	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 18 45.42	76 25 04.36	S 6 40 E	N 6 40 W	988	Carroll 2.
			S 79 23 E	N 79 23 W	1746	Hog 2.
			N 20 54 W	S 20 55 E	874	Drum Point Light.
2	38 18 52.28	76 25 04.30	S 5 19 E	N 5 19 W	1220	Carroll 2.
			S 72 08 E	N 72 08 W	1802	Hog 2.
			N 27 23 W	S 27 23 E	656	Drum Point Light.
3	38 19 07.56	76 24 21.07	N 87 21 W	S 87 21 E	1462	Drum Point Light.
			S 30 57 W	N 30 57 E	2013	Carroll 2.
			S 27 56 E	N 27 56 W	1210	Hog 2.
4	38 19 03.80	76 24 17.62	N 82 51 W	S 82 52 E	1565	Drum Point Light.
			S 35 10 W	N 35 09 E	1958	Carroll 2.
			S 26 46 E	N 26 46 W	1054	Hog 2.
	Thence along county boundary as delineated on Chart No. 20 to corner No. 1.					

SIMMONS.

(*Entrance Patuxent River—Chart No. 20.*)

Corner of bar	Latitude	Longitude	True bearing		Distance	U. S. C. & G. S. triangulation station
			Forward	Back		
	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 19 29.40	76 24 22.40	S 64 52 W	N 64 52 E	1575	Drum Point Light.
			S 22 06 W	N 22 06 E	2659	Carroll 2.
			S 18 27 E	N 18 26 W	1903	Hog 2.
2	38 19 36.67	76 24 29.70	S 53 26 W	N 53 25 E	1534	Drum Point Light.
			S 16 35 W	N 16 34 E	2826	Carroll 2.
			S 21 13 E	N 21 13 W	2199	Hog 2.
3	38 19 43.80	76 24 15.42	S 54 19 W	N 54 19 E	1984	Drum Point Light.
			S 21 54 W	N 21 54 E	3179	Carroll 2.
			S 10 18 E	N 10 18 W	2327	Hog 2.
4	38 19 36.56	76 24 08.78	S 63 01 W	N 63 00 E	2006	Drum Point Light.
			S 26 44 W	N 26 43 E	3036	Carroll 2.
			S 6 41 E	N 6 40 W	2060	Hog 2.

CHINESE MUDS (CALVERT COUNTY).

(*Entrance Patuxent River—Chart No. 20.*)

	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 19 17.14	76 23 47.02	S 83 51 W	N 83 50 E	2380	Drum Point Light.
			S 13 40 W	N 13 40 E	1432	Hog 2.
			S 45 24 E	N 45 23 W	3820	Cedar Point Light.
2	38 19 47.84	76 23 39.57	S 63 17 W	N 63 16 E	2863	Drum Point Light.
			S 12 28 W	N 12 27 E	2485	Hog 2.
			S 34 15 E	N 34 14 W	4479	Cedar Point Light.
3	38 20 39.76	76 23 17.16	N 1 58 E	S 1 58 W	2035	Pat.
			S 46 06 W	N 46 04 E	4384	Drum Point Light.
			S 19 25 E	N 19 25 W	5792	Cedar Point Light.
4	38 21 01.14	76 22 41.20	N 33 59 W	S 34 00 E	1584	Pat.
			S 47 34 W	N 47 32 E	5574	Drum Point Light.
			S 8 55 E	N 8 55 W	6259	Cedar Point Light.
5	38 20 46.06	76 22 13.08	N 41 55 W	S 41 56 E	2449	Pat.
			S 56 13 W	N 56 11 E	5849	Drum Point Light.
			S 2 15 E	N 2 15 W	5679	Cedar Point Light.
6	38 19 37.58	76 21 34.27	N 32 48 W	S 32 49 E	4915	Pat.
			S 80 55 W	N 80 52 E	5968	Drum Point Light.
			S 13 30 W	N 13 30 E	3461	Cedar Point Light.

Thence along county boundary as delineated on Chart No. 20 to corner No. 1.

PARKER MOORE.

(Entrance Patuxent River—Chart No. 20.)

Corner of bar	Latitude	Longitude	True bearing		Distance	U. S. C. & G. S. triangulation station
			Forward	Back		
	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 19 47.84	76 23 39.57	S 63 17 W	N 63 16 E	2863	Drum Point Light.
			S 12 28 W	N 12 27 E	2485	Hog 2.
			S 34 15 E	N 34 14 W	4479	Cedar Point Light.
2	38 20 51.48	76 23 50.23	S 33 34 W	N 33 33 E	4124	Drum Point Light.
			S 3 10 W	N 3 10 E	4579	Hog 2.
			S 25 35 E	N 25 34 W	6494	Cedar Point Light.
3	38 20 59.42	76 23 38.88	N 25 14 E	S 25 14 W	1516	Pat.
			S 34 53 W	N 34 53 E	4515	Drum Point Light.
			S 6 32 W	N 6 32 E	4872	Hog 2.
4	38 20 39.76	76 23 17.16	N 1 58 E	S 1 58 W	2035	Pat.
			S 46 06 W	N 46 04 E	4384	Drum Point Light.
			S 19 25 E	N 19 25 W	5792	Cedar Point Light.

UNDER THE CLIFFS.

(Entrance Patuxent River—Chart No. 20.)

	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 20 11.66	76 24 25.40	S 32 44 W	N 32 44 E	2489	Drum Point Light.
			S 13 19 W	N 13 19 E	3996	Carroll 2.
			S 11 55 E	N 11 55 W	3300	Hog 2.
2	38 20 13.98	76 24 29.06	S 29 54 W	N 29 54 E	2505	Drum Point Light.
			S 11 44 W	N 11 44 E	4061	Carroll 2.
			S 13 15 E	N 13 15 W	3399	Hog 2.
3	38 20 53.46	76 23 53.58	N 32 02 W	S 32 02 E	4133	Drum Point Light.
			S 2 01 W	N 2 01 E	4642	Hog 2.
			S 26 02 E	N 26 01 W	6593	Cedar Point Light.
4	38 20 51.48	76 23 50.23	S 33 34 W	N 33 33 E	4124	Drum Point Light.
			S 3 10 W	N 3 10 E	4579	Hog 2.
			S 25 35 E	N 25 34 W	6494	Cedar Point Light.

LITTLE COVE POINT.

(*Entrance Patuxent River—Chart No. 20.*)

Corner of bar	Latitude	Longitude	True bearing		Distance	U. S. C. & G. S. triangulation station
			Forward	Back		
	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 20 39.76	76 23 17.16	N 1 58 E	S 1 58 W	2035	Pat.
			S 46 06 W	N 46 04 E	4384	Drum Point Light.
			S 19 25 E	N 19 25 W	5792	Cedar Point Light.
2	38 20 59.42	76 23 38.88	N 25 14 E	S 25 14 W	1516	Pat.
			S 34 53 W	N 34 53 E	4515	Drum Point Light.
			S 6 32 W	N 6 32 E	4872	Hog 2.
3	38 21 20.38	76 23 16.98	N 5 34 E	S 5 34 W	667	Pat.
			S 35 39 W	N 35 38 E	5428	Drum Point Light.
			S 11 35 W	N 11 34 E	5663	Hog 2.
4	38 21 01.14	76 22 41.20	N 33 59 W	S 34 00 E	1584	Pat.
			S 47 34 W	N 47 32 E	5574	Drum Point Light.
			S 8 55 E	N 8 55 W	6259	Cedar Point Light.

COVE POINT BIGHT.

(*Entrance Patuxent River—Chart No. 20.*)

	° ′ ″	° ′ ″	° ′	° ′	*Yards.*	
1	38 21 26.96	76 22 07.02	N 20 11 W	S 20 12 E	3715	Cove Point Light.
			N 76 09 W	S 76 10 E	1846	Pat.
			S 0 30 E	N 0 30 W	7055	Cedar Point Light.
2	38 22 20.98	76 23 03.09	N 7 03 E	S 7 03 W	1682	Cove Point Light.
			N 62 59 W	S 62 59 E	934	White House (N. E. chimney).
			S 12 26 W	N 12 26 E	1412	Pat.
3	38 22 30.21	76 22 47.66	N 8 32 W	S 8 32 E	1369	Cove Point Light.
			N 84 48 W	S 84 49 E	1247	White House (N. E. chimney).
			S 22 53 W	N 22 53 E	1835	Pat.
4	38 21 34.40	76 21 56.12	N 25 54 W	S 25 54 E	3598	Cove Point Light.
			N 84 44 W	S 84 45 E	2091	Pat.
			S 1 47 W	N 1 47 E	7309	Cedar Point Light.

APPENDIXES.

APPENDIX A.—LAWS RELATING TO THE COOPERATION OF THE COAST AND GEODETIC SURVEY AND BUREAU OF FISHERIES WITH THE MARYLAND SHELL FISH COMMISSION.

The work of the Coast and Geodetic Survey and of the Bureau of Fisheries, in cooperation with the Maryland Shell Fish Commission, in surveying the oyster bars, establishing permanent landmarks at triangulation stations, and preparing for publication the necessary charts and technical and legal descriptions of boundaries and landmarks shown on these charts, has been executed in compliance with a request from the governor of the State of Maryland to the Secretary of Commerce and Labor, and by the authority of the following laws of the United States and Maryland:

[Act of Congress approved May 26, 1906.]

AN ACT To authorize the Secretary of Commerce and Labor to cooperate, through the Bureau of the Coast and Geodetic Survey and the Bureau of Fisheries, with the shellfish commissioners of the State of Maryland in making surveys of the natural oyster beds, bars, and rocks in the waters within the State of Maryland.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of Commerce and Labor be, and he is hereby, authorized and directed, upon the request of the governor of the State of Maryland, to designate such officers, experts, and employees of the Bureau of the Coast and Geodetic Survey and of the Bureau of Fisheries as may be necessary to cooperate with the Maryland State board of shellfish commissioners in making a survey of and locating the natural oyster beds, bars, and rocks in the waters within the State of Maryland; and the Secretary of Commerce and Labor is hereby authorized and directed to furnish to the officers, experts, and employees of said Bureaus so detailed as aforesaid such instruments, appliances, and steam launches as may be necessary to make the survey aforesaid; and the Secretary of Commerce and Labor is hereby authorized to have made in the Bureau of the Coast and Geodetic Survey all the plats necessary to show the results of the aforesaid survey and the locations of the said natural oyster beds, bars, and rocks in the waters within the State of Maryland, and to furnish to the board of shellfish commissioners of the State of Maryland such copies as may be necessary, and for this purpose to employ, in the District of Columbia and elsewhere, such technically qualified persons as may be necessary to carry out the purpose of this act.

SEC. 2. That the Secretary of Commerce and Labor is hereby further authorized to have erected or constructed by the officers so detailed as aforesaid, while making such survey, such structures as may be necessary to mark the points of triangulation, so that the same may be used for such future work of the Coast and Geodetic Survey as the said Bureau may be hereafter required to perform in prosecuting the Government coast survey of the navigable waters of the United States located within the State of Maryland.

* * * * * * *

SEC. 4. That this act shall take effect from the date of its passage.

[Act of Congress approved June 30, 1906.]

AN ACT Making appropriations for sundry civil expenses of the Government for the fiscal year ending June thirtieth, nineteen hundred and seven, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following sums be, and the same are hereby, appropriated, for the objects hereinafter expressed, for the fiscal year ending June thirtieth, nineteen hundred and seven, namely: * * *

COAST AND GEODETIC SURVEY: * * * For any special surveys * * * including the expenditures authorized under Public Act Numbered One hundred and eighty-one, approved May twenty-sixth, nineteen hundred and six, and contingent expenses incident thereto, five thousand dollars, together with the unexpended balance under this appropriation for nineteen hundred and six and prior years which is hereby reappropriated and made available on this account for the fiscal year nineteen hundred and seven. * * *

[Act of Congress approved March 4, 1907.]

AN ACT Making appropriations for sundry civil expenses of the Government for the fiscal year ending June thirtieth, nineteen hundred and eight, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following sums be, and the same are hereby, appropriated, for the objects hereinafter expressed, for the fiscal year ending June thirtieth, nineteen hundred and eight, namely: * * *

COAST AND GEODETIC SURVEY: * * * For any special surveys * * * including expenses of surveys in aid of the shellfish commission of the State of Maryland, to be immediately available and to continue available until expended, twenty-five thousand dollars. * * *

[Act of Congress approved May 27, 1908.]

AN ACT Making appropriations for sundry civil expenses of the Government for the fiscal year ending June thirtieth, nineteen hundred and nine, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following sums be, and the same are hereby, appropriated, for the objects hereinafter expressed, for the fiscal year ending June thirtieth, nineteen hundred and nine, namely: * * *

COAST AND GEODETIC SURVEY: * * * For any special surveys * * * including expenses of surveys in aid of the shellfish commission of the State of Maryland, which expenses, including cost of plats and charts, shall not exceed fifteen thousand dollars in any one year, to be immediately available, twenty thousand dollars.

[Act of Congress approved March 4, 1909.]

AN ACT Making appropriations for sundry civil expenses of the Government for the fiscal year ending June thirtieth, nineteen hundred and ten, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following sums be, and the same are hereby, appropriated, for the objects hereinafter expressed, for the fiscal year ending June thirtieth, nineteen hundred and ten, namely: * * *

COAST AND GEODETIC SURVEY: * * * For any special surveys * * * including expenses of surveys in aid of the shellfish commission of the State of Maryland, which expenses, including cost of plats and charts, shall not exceed fifteen thousand dollars in any one year, to be immediately available, twenty thousand dollars.

[Act of the legislature of Maryland approved April 2, 1906.]

AN ACT To establish and promote the industry of oyster culture in Maryland, to define and mark natural oyster beds, bars and rocks lying under the waters of this State, to prescribe penalties for the infringement of the provisions of this Act, and * * *

SECTION 1. *Be it enacted by the General Assembly of Maryland,* That the following sections be, and they are hereby, added to Article 72 of the Code of Public General Laws, title "Oysters." * * *

SEC. 86. The Board of Shell Fish Commissioners shall, as soon as practicable after the passage of this Act, cause to be made a true and accurate survey of the natural oyster beds, bars and rocks of this State, said survey to be made with reference to fixed and permanent objects on the shore, giving courses and distances, to be fully described and set out in a written report of said survey, as hereinafter required. A true and accurate delineation of the same shall be made on copies of published maps and

charts of the United States coast and geodetic survey, which said copies shall be filed in the office of the said commissioners in the city of Annapolis; and the said commissioners shall further cause to be delineated upon copies of the published maps and charts of the United States coast and geodetic survey, of the largest scale, one copy for each of the counties of this State in the waters of which there are natural oyster beds, bars and rocks, all natural beds, bars and rocks lying within the waters of such county, which maps shall be filed in the offices of the clerks of the Circuit Court for the respective counties wherein the grounds so designated may lie. * * *

SEC. 87. The Governor of this State is hereby requested to ask the assistance of the United States coast and geodetic survey, and of the United States Fish Commissioner, to aid in the carrying out of the provisions of the preceding section.

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SEC. 89. As soon as practicable after the first day of April, 1906, the said commissioners shall organize, and shall at once proceed, with the assistance of such person or persons as may be detailed by the United States coast and geodetic survey, and the United States Fish Commissioner, to aid them in their work, and of such persons as may be appointed under the preceding section, to have laid out, surveyed and designated on the said charts, the natural beds and bars, and shall cause to be marked and defined as accurately as practicable, the limits and boundaries of the natural beds, bars and rocks, as established by said survey, and they shall take true and accurate notes of said survey in writing, and make an accurate report of said survey, setting forth such a description of landmarks as may be necessary to enable the said board, or their successors, to find and ascertain the boundary lines of the said natural oyster beds, bars and rocks, as shown by a delineation on the maps and charts provided in this Act; said report shall be completed and filed in the office of the board in the city of Annapolis within ninety days after the completion of the survey of any county. Said commissioners shall cause the same to be published in pamphlet form, and transmit copies of the same to the clerks of the Circuit Court for the respective counties, where the charts have been filed or directed to be filed as hereinafter provided; the said report to be filed by the clerks of the several counties in a book kept for that purpose. And the said survey and report, when filed, subject to the right of appeal hereafter provided for in this Act, shall be taken in all of the courts of this State as conclusive evidence of the boundaries and limits of all natural oyster beds, bars and rocks, lying within the waters of the county wherein such survey and report are filed, and shall be construed to mean in all of the said courts that there are no natural oyster beds, bars or rocks lying within the waters of the counties wherein such report and survey are filed other than those embraced in the survey authorized by this Act, and that all areas of the Chesapeake Bay and its tributaries within the State of Maryland, not shown in the survey to be natural oyster beds, bars or rocks shall be construed in all the courts of the State to be barren bottoms, and open for disposal by the State for the purpose of private planting or propagation of oysters thereon under the provisions of this Act; provided, that the said survey and report shall not be construed as to affect in any manner the holdings by citizens of this State in any lot which may have been appropriated or taken up under the laws of this State prior to the approval of this Act

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The law of the State of Maryland, passed March 9, 1842, authorizing officers of the United States Coast and Geodetic Survey to enter upon the lands within the State limits for the purposes of the Survey, is as follows:

AN ACT Concerning the Survey of the Coast of Maryland.

SECTION 1. *Be it enacted by the General Assembly of Maryland,* That it shall and may be lawful for any person or persons employed under and by virtue of an act of the Congress of the United States, * * * at any time hereafter to enter upon lands within this State for the purpose of exploring, surveying, triangulating, or levelling, or doing any other matter or thing which may be necessary to effect the objects of said act, and to erect any works, stations, buildings, or appendages requisite for that purpose, doing no unnecessary injury to private or other property.

SEC. 2.[a] *And be it enacted,* That in case the person or persons employed under the act of Congress aforesaid, can not agree with the owners or possessors of the land so entered upon and used as to the

[a] Under the rulings of the Comptroller of the Treasury no damages can be collected except through the United States Court of Claims unless an agreement has been made in advance.

amount of damage done thereto by reason of the removal of fences, cutting of trees or injury to the crop or crops growing on the same, it shall and may be lawful for the said parties or either of them to apply to the chief justice for the time being or one of the associate judges of the judicial district in which such land may be situated, who shall thereupon appoint three disinterested and judicious freeholders, residents of the same judicial district, to proceed with as much despatch as possible to the examination of the matter in question, and the faithful assessment of the damages sustained by the owners or possessors aforesaid, and the said freeholders or a majority of them, having first taken and subscribed an oath or affirmation before the chief or associate justice aforesaid or other person duly authorized to administer the same, that they will well and truly examine and assess as aforesaid, and having given five days' notice to both parties of the time of their meeting, shall proceed to the spot, and then and there upon their own view and if required, upon the evidence of witnesses, (to be by them sworn or affirmed and examined) shall assess the said damages, and shall afterward make report thereof and of their proceedings in writing under their hands and seals and file the same within five days thereafter in the office of the clerk of the county in which the land aforesaid is situated, subject to an appeal by either party to the county court of the said county within ten days after filing as aforesaid, and the said report so made as aforesaid if no appeal as aforesaid be taken, shall be held to be final and conclusive as between the said parties, and the amount so assessed and reported shall be paid to the said owners or possessors of the land so damaged within twenty days after the filing of said report, and the said chief or associate justice as aforesaid, shall have authority to tax and allow upon the filing of said report, such costs, fees and expenses to the said freeholders for the performance of their duty as he shall think equitable and just, which allowance shall be paid by the person or persons employed under the act of congress aforesaid, within the time last above limited, but if an appeal as aforesaid be taken, the case shall be set down for hearing at the first term of county court aforesaid, ensuing upon and after appeal, and it shall be lawful for either party immediately after the entry of such appeal, to take out summons for such witnesses as may be necessary to be examined upon the hearing aforesaid, and the said court shall have power in its discretion to award costs against which ever the final judgment shall be entered, and such appeal at the option of either party may and shall be heard before and the damage assessed by a jury of twelve men to be taken from the regular panel and elected as in other cases.

SEC. 3. *And be it enacted*, That if any person or persons shall wilfully injure or deface or remove any signal, monument or building or any appendage thereto, erected, used or constructed under and by virtue of the act of congress aforesaid, such person or persons so offending shall severally forfeit and pay the sum of fifty dollars with costs of suit to be sued for and recovered by any person who shall first prosecute the same before any justice of the peace of the county where the person so offending may reside, and shall also be liable to pay the amount of damages thereby sustained, to be recovered with costs of suit in an action on the case, in the name and for the use of the United States of America, in any court of competent jurisdiction.

APPENDIX B.—THE HAMAN OYSTER CULTURE LAW.

[Extract from Second Report of Shell Fish Commission.]

OBJECT.

"The legislature in placing chapter 711 of the acts of 1906, better known as the Haman Oyster Culture Law, upon the statute books of Maryland had a twofold object in view:

1. To *encourage* an industry in oyster culture upon the *barren bottoms* beneath the tidewaters of the State.

2. To *prevent* the leasing of *natural oyster bars* for the purpose of oyster culture."

SURVEY.

"To make the leasing of barren bottoms possible and the leasing of natural bars impossible, provision was made for a survey of the natural bars for the purpose of accurately locating and marking the same. It was definitely provided that no barren bottoms should be leased in any part of the State until the natural bars of that region had been surveyed, charted, and marked with buoys."

Definition of a Natural Oyster Bar.

NATURAL BAR NOT DEFINED.

"The Shell Fish Commission is instructed by section 90 of the Haman Oyster Culture Law to exercise its judgment liberally in favor of the natural bars when surveying, charting and buoying them, but other than this the Commission is uninstructed in this important matter. The responsibility of defining a natural bar is placed upon the Commission."

DIVERSITY OF OPINION.

"No definition of a natural oyster bar could be formulated by any man or body of men which would meet with the approval of all parties concerned. Oystermen, as a rule, hold that all bottoms where oysters grow or have grown naturally even though now practically barren of oysters should be considered natural bars. Other citizens of the State who are not directly interested in the oyster business, but interested in the oyster industry from the standpoint of revenue, hold, as a rule, that no bottoms should be excluded from leasing for oyster culture which, by methods known to oyster culturists, may be made to yield a greater number of oysters than they now produce."

"It should be evident to every one that neither of these definitions could be adopted by the Commission as a working basis for determining which of the grounds surveyed are natural oyster bars."

THE GOLDSBOROUGH DEFINITION.

The definition of a natural oyster bar which very nearly approaches a reasonable and satisfactory compromise between the views of the subject held by *oystermen* on one hand and by *oyster culturists* on the other is that contained in an opinion rendered by Judge Charles F. Goldsborough in the circuit court for Dorchester County in the July term, 1881, in the case of William T. Windsor and George R. Todd *v.* Job T. Moore.

This definition has been adopted by the Shell Fish Commission as the basis for the determination of the status of the various oyster bottoms surveyed and is as follows:

What then is a natural bar or bed of oysters? It would be a palpable absurdity for the State to attempt to promote the propagation and growth of oysters and to encourage its citizens, by a grant of land, to engage in their culture, if the lands authorized to be taken up were only those upon which oysters do not and can not be made to grow. That there may be lands covered by water in the State where no oysters can be found, but where, if planted, they could be cultivated successfully, may be possible, but, if so, I imagine that their extent must be too limited for them to be of much practical, general advantage for the purposes of such a law as the one under discussion; but there are thousands of acres of hard and shifting sands where oysters not only are not found, but where it would be folly to plant them; and these latter it can not be supposed that the State intended to offer to give away, for the simple reason that the State could not help knowing that nobody would have them.

Upon the other hand there are large and numerous tracts where oysters of natural growth may be found in moderate numbers, but not in quantities sufficient to make it profitable to catch them, and yet where oysters may be successfully planted and propagated. In my opinion these can not be called natural bars or beds of oysters, within the meaning of the Act of Assembly, and it is just such lands as these that the State meant to allow to be taken up under the provisions of the above-mentioned section of the Act.

But there is still another class of lands where oysters grow naturally and in large quantities and to which the public are now and have been for many years in the habit of resorting with a view to earning a livelihood by catching this natural growth, and here, I think, is the true test of the whole question. Land can not be said to be a natural oyster bar or bed merely because oysters are scattered here and there upon it, and because if planted they will readily live and thrive there; but whenever the natural growth is so thick and abundant that the public resort to it for a livelihood, it is a natural oyster bar or bed and comes within the above-quoted restriction in the law, and can not be located or appropriated by any individual.

APPLICATION OF DEFINITION.

Before this definition may be of use in determining, accurately and scientifically, the status of an oyster ground, its central idea, "livelihood," must be expanded into accurately determinable factors, and these factors must be combined into a practical scheme of investigating the condition of the ground under consideration.

Stated briefly, a *livelihood* is represented by a *sum of money* obtained from the sale, at a fixed *price*, of a certain *quantity of oysters* gathered in a given *time* from an allotted *area* of ground.

Knowing the value of each of these factors it becomes possible to calculate the number of oysters an oyster ground must produce per square yard in order that oystermen may secure a livelihood by working upon it.

NOTE.—The factors into which the Commission resolved the livelihood problem, the value assigned to each factor, and the scheme devised for practical use in examining and applying the definition to oyster bottoms are given in outline in their Second Report under the heading of the preceding extract, and in detail in their First Report on pages 32 to 69.

APPENDIX C.—SUMMARY OF THE PARTICULAR SURVEYING OPERATIONS WHICH CONSTITUTE AN "OYSTER SURVEY" AS NOW BEING CARRIED ON IN MARYLAND.

Explanation.—A brief account of the particular surveying operations which constitute an "oyster survey" as now being carried on in Maryland will assist in the interpretation of records contained in the technical part of this report, and will be of interest to many who may not understand the necessity for the great amount of work being done or its complicated character.

To those familiar with methods used in surveying and charting the characteristic features of large bodies of water there is an evident necessity for the various operations performed, especially when it is known that the boundaries of the public oyster bars and of the private lots leased for purposes of oyster culture must be surveyed and charted with the greatest practical accuracy. To others it will be sufficient to state that the actual experience gained from oyster surveys in other States has proven that in order to avoid endless dissatisfaction and litigation it is necessary to accurately locate and permanently establish oyster boundaries as is now being done in Maryland.

Triangulation survey.—Such refinement of survey work as that demanded by the conditions of an oyster survey when carried on at considerable distances offshore can only be obtained by the use of a system of triangulation as a frame work or foundation. Therefore, a triangulation survey including the permanent marking of the positions of landmarks with monuments and a record of the descriptions of their locations for future recovery is a necessary operation of a complete oyster survey.

Topographic survey.—The technical records which establish the relation between the offshore oyster boundaries and triangulation landmarks are sufficient for the requirements of engineers in making resurveys, but do not supply the needs of others who are interested in the same boundaries by reason of their occupation as oystermen concerned as to the public oyster bars, or oyster culturists concerned as to the leasable bottoms. For these it is necessary to have the charts of the survey show the relation of the shore line and other topographic features to the boundaries of the public oyster bars and private oyster farms. Therefore, a topographic survey is a necessary operation of a complete oyster survey.

Hydrographic survey.—In the settlement of the important question of what is, or what is not, a natural oyster bar, and in the consideration of bottoms to be selected for purposes of oyster culture, information as to the depth of water and the character of the bottom is required. Therefore, a hydrographic survey is a necessary operation of a complete oyster survey.

Necessary foundation for an oyster survey.—Consequently, the necessary components of a satisfactory foundation for a complete oyster survey are the three classes of survey operations technically named triangulation, topography, and hydrography, or, stated in another way, the foundation of a practical oyster survey includes the surveying operations usually followed by the Coast and Geodetic Survey leading up to the preparation and publication of nautical charts.

Special surveys and investigations pertaining to oysters.—Having obtained this cartographic survey for a foundation, partly by new work and partly from records of previous work of the Government, the combined operations [a] making up an "oyster survey" are completed by superimposing on this foundation special surveys and investigations pertaining particularly to oysters or other shell fish.

The special surveys pertaining to oysters furnish information as to the location and outline of oyster-shell bottoms, and are carried on by the sounding boat party in addition to the usual hydrographic work.[b] This operation consists of the observation and record of the character of vibration of a wire and chain apparatus which is dragged over the bottom, the vibrations or lack of vibrations indicating the presence and quantity of shells or absence of shells.

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[a] See Appendix D of this publication for "Statistics of results of combined operations of the Government and State."

[b] See pages 104 to 123 of "First Annual Report of Maryland Shell Fish Commission."

The special oyster investigations [a] consist of the actual determination of the kind and quantity of oysters on the bottom, and such economic and biological studies of the supply of oyster food, density of water, character of the bottom, and other important matters as affect the growth of oysters. In this work the oyster investigation stations are located and buoyed by the hydrographic party while engaged in the survey of the oyster-shell limits. They are selected with the view of obtaining characteristic data which can be used for the interpretation of the recorded vibrations of the chain apparatus at all other points covered by the survey.

Preparation of results.—The actual surveying operations and oyster investigations having been completed for any one county, there still remains technical work of nearly equal magnitude to that described.[b] This work consists of the preparation of charts and technical descriptions of boundaries and landmarks for publication by the Government, the preparation of that part of the annual report of the Commission covering the special oyster surveys and investigations, the making of the leasing charts and finished projections, and finally the filing of the oyster charts and records with the courts and the Commission, thus opening a county for oyster culture.

Summary.—From the foregoing account it can be seen that a complete oyster survey properly conducted so as to answer all practical requirements of the present and permanency of results for the future is a very complicated affair, involving many lines of surveying and other scientific work, and requiring the professional services of experts in the various operations of cartographic surveying and shell-fish investigations.

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[a] See pages 30 to 67 and 129 to 199 of "First Annual Report of Maryland Shell Fish Commission."

[b] No mention is made here of the large amount of administrative work of the Commission, which is greatly complicated and increased by the effect of the oyster-survey operations on many thousands of people whose interests are more or less involved; or of the large amount of survey work involved in the survey and record of the boundaries of oyster lots leased from the State by private individuals for the purposes of oyster culture.

APPENDIX D.—STATISTICS OF RESULTS OF THE COMBINED OYSTER SURVEY OPERATIONS OF THE GOVERNMENT AND STATE.[a]

Operations.	Anne Arundel County.	Somerset County.	Wicomico County.	Worcester. County.	Calvert County.	Total.[b]
Beginning of field work	June 29,1906	May 2, 1907	Aug. 27,1907	Nov. 8, 1907	May 2, 1908	
Filing of certified charts and reports	June 20,1907	July 1, 1908	Dec. 1, 1908	Apr. 12, 1909	Dec. 14, 1909	
Natural oyster bars surveyed and delineated	91	37	15	28	41	212
Acres of natural oyster bars	33,666	27,566	2,038	1,655	12,303	[c] 77,228
Crab bottoms surveyed and delineated		54				54
Acres of crab bottoms		32,108				32,108
Clam beds surveyed and delineated		3				3
Acres of clam beds		506				506
Boundary buoys located and planted	362	154	53	108	149	826
Triangulation landmarks established	123	86	30	48	78	334
Miles of shore line covered by triangulation	110	125	46	95	95	455
Square miles of water covered by triangulation	220	375	44	110	157	887
Miles of examination of shell bottom with chain apparatus	369	296	58	63	250	1,036
Oyster investigation stations occupied	440	679	162	147	667	2,095
Tide stations established	4	3	1	1	2	11
Number of soundings over shell bottoms	37,049	17,904	3,387	3,649	11,292	73,281
Square miles covered by soundings and chain apparatus	58	47	3	3	30	131
Projections prepared and plotted	9	13	2	5	8	36
Leasing charts prepared	13	12	2	3	5	35
Oyster charts published	4	6	2	3	5	20
Reports published	2	2	2	2	2	7
Progress maps published	2	2	2	2	2	7

[a] These statistics do not include the large amount of triangulation, topography, and hydrography resulting from previous work of the Coast and Geodetic Survey, which was utilized in the preparation of the published oyster charts and records. Work in St. Marys and Charles counties has been finished, but final statistics of results will not be published until these counties are opened for oyster culture.

[b] Less quantities covered by statistics of more than one county.

[c] Total area of natural oyster bars of Connecticut is 5,770 acres.

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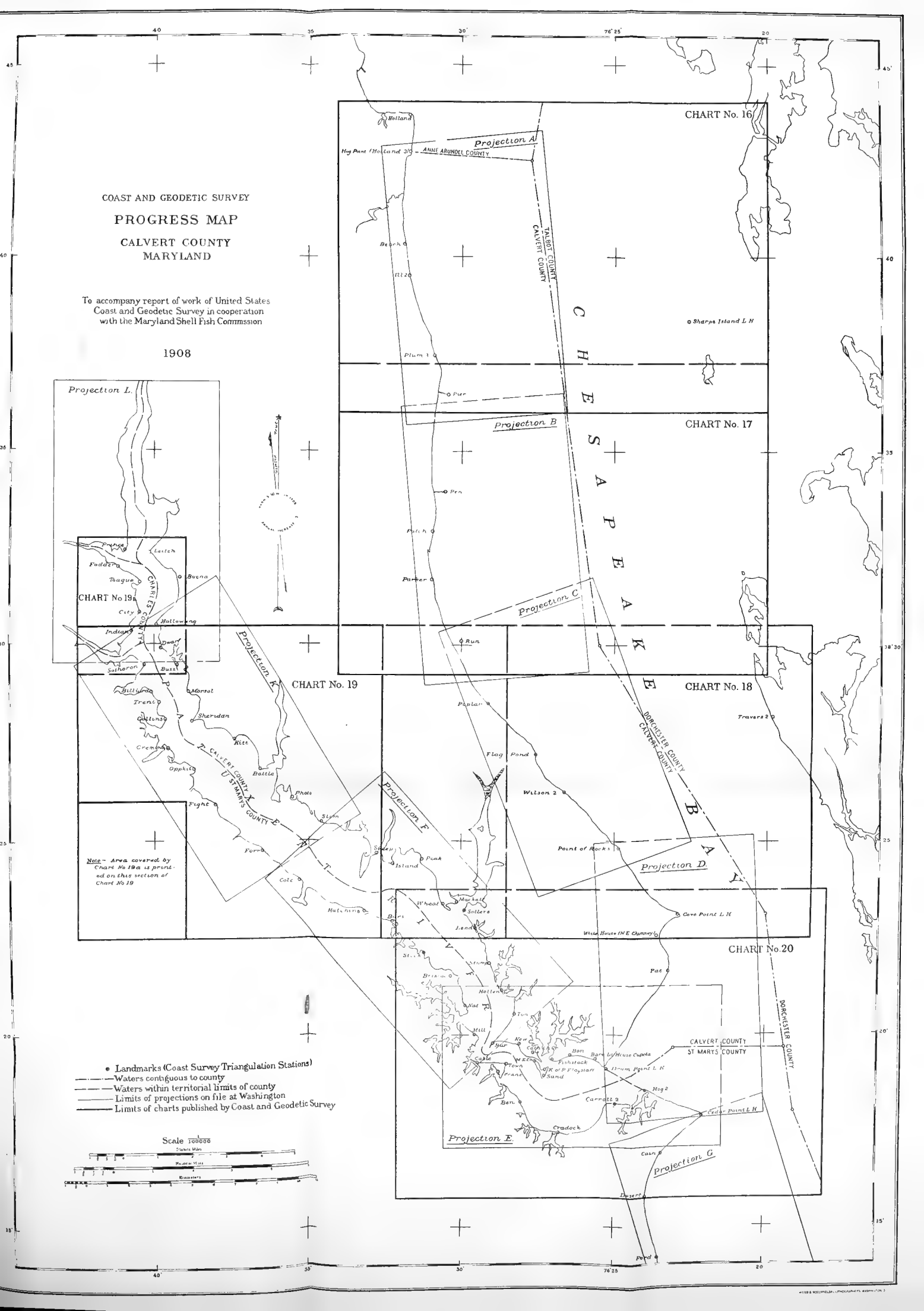
COAST AND GEODETIC SURVEY
PROGRESS MAP
CALVERT COUNTY
MARYLAND
To accompany report of work of United States Coast and Geodetic Survey in cooperation with the Maryland Shell Fish Commission
1908
CHART No. 16
CHART No. 17
CHART No. 18
CHART No. 19
CHART No. 19a
CHART No. 20
Projection A
Projection B
Projection C
Projection D
Projection E.
Projection F
Projection G
Projection K
Projection L.
CHESAPEAKE BAY
ANNE ARUNDEL COUNTY
TALBOT COUNTY
CALVERT COUNTY
DORCHESTER COUNTY
ST MARYS COUNTY
Note- Area covered by Chart No 19a is printed on this section of Chart No 19
Landmarks (Coast Survey Triangulation Stations)
Waters contiguous to county
Waters within territorial limits of county
Limits of projections on file at Washington
Limits of charts published by Coast and Geodetic Survey
Scale 1/100000