

5678

5678

|                                |                  |
|--------------------------------|------------------|
| Form 504<br>Rev. Dec. 1933     |                  |
| DEPARTMENT OF COMMERCE         |                  |
| U.S. COAST AND GEODETIC SURVEY |                  |
| R. S. PATTON, DIRECTOR         |                  |
| DESCRIPTIVE REPORT             |                  |
| Topographic<br>Hydrographic    | Sheet No. T-5678 |
|                                |                  |
| State Maryland                 |                  |
| LOCALITY                       |                  |
| Chesapeake Bay                 |                  |
| Bush River                     |                  |
| (Lower part)                   |                  |
| Date of photographs; 1937      |                  |
| 1939                           |                  |
| CHIEF OF PARTY                 |                  |
| L. W. Swanson                  |                  |

Applied to Ch 1226 - thru Ch. 572 - Dec 1940 - jfw

DEPARTMENT OF COMMERCE  
U.S. COAST AND GEODETIC SURVEY

REG. NO.

TOPOGRAPHIC TITLE SHEET

The Topographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

Field No. T-5678

REGISTER NO. T5678

State Maryland

General locality Chesapeake Bay

Locality Bush River LOWER PART  
photographs

Scale 1:10,000 x 0.965 Date of survey April 30 & May 1, 19 37

Vessel Air Photographic Survey Party No. 2

Chief of party L. W. Swanson

Field Inspection: L.W. Swanson, E.L. Jones, W.C. Russell,  
Surveyed by A.L. Wardwell, D.A. Jones,

Compilation: W. C. Russell  
Inked by W. C. Russell

Heights in feet above ----- to ground to tops of trees

Contour, Approximate contour, Form line interval ---- feet

Instructions dated March 4th and May 13th, 19 38

Remarks: -----

Photographs

| Nos.        | Date      | Time      | Scale  | Altitude | Stage of Tide*       |
|-------------|-----------|-----------|--------|----------|----------------------|
| ✓ 1496      | 5/1/37 ✓  | 2:58 ✓    | 1:9650 |          | 1.4 ft. above M.L.W. |
| ✓ 1259-1260 | 4/30/37 ✓ | 2:20-2:21 | "      |          | 1.0 ft. above M.L.W. |
| ✓ 1266-1269 | "         | 2:26-2:28 | "      |          | "                    |
| ✓ 1288-1293 | "         | 2:42-2:45 | "      |          | "                    |
| ✓ 1300-1301 | "         | 2:49-2:50 | "      |          | "                    |

\* Tide from predicted tables (Wilson Pt., Bush River) mean range=1.5 ft.  
spring " =1.8 ft.

Camera: U. S. Coast & Geodetic Survey nine lens, F 8 $\frac{1}{2}$  inches  
Negatives on file in Washington Office.

Supplemental Surveys

Graphic control surveys: None

Aberdeen Proving Grounds Boundary survey blue print, revised to May 1935

Field Inspection: L.W.Swanson, E.L.Jones, W.C.Russell Nov. 1937

D.A.Jones May 1938

A.L.Wardwell, D.A.Jones May 1939

*See note below*

General Information

Chief of Party: L. W. Swanson

Projection by: Ruling machine

date unknown

Projection checked by: Washington Office

" "

Radial points pricked by: E. L. Jones

Additional radial points by: W. C. Russell

Control plotted by: J. C. Partington

March 28, 1938

W. C. Russell

May 24, 1939

Control checked by: W. C. Russell

March 29, 1938

Additional control checked by: D. A. Jones

May 24, 1939

Radial plot by: J. C. P., L. W. S., E. L. J., W. C. R. March 31, 1938

Additional radial plot by: R.A.Gilmore, A.L.Wardwell April 8, 1939

Shoreline inked by: W. C. Russell

April 23 to 25, 1938

June 16 to 20, 1939

Detail inked by: W. C. Russell

May 1 to May 23, 1938

June 22 to Aug. 1, 1939

Preliminary review by: J. W. Jones

Aug 14-16

1939.

Smooth draft by:

STATISTICS

|                                                 |      |                   |
|-------------------------------------------------|------|-------------------|
| Area (land)                                     | 25.0 | sq. statute miles |
| Shoreline (more than 200m. from opposite shore) | 39.0 | " "               |
| Shoreline (creeks)                              | 18.0 | " "               |
| Roads, streets, trail, and railroads            | 107  | " "               |

Reference Station

Reference station: Airway Beacon #61-A, 1933 N. A. 1927 Datum

Latitude: 39° 23' 29.184" (900.0 m.) adjusted

Longitude: 76° 17' 37.566" (899.0 m.) adjusted

Maryland system of plane coordinates:  $x = 999,606.44$   $y = 568,216.46$

*Note: Shoreline details on T-5678 are of the date of the photographs  
may 1937. Details in Aberdeen Proving Ground are of the date of the  
photo graphs with corrections to 1939. See Page 4*

DESCRIPTIVE REPORT  
to accompany  
AIR PHOTOGRAPHIC SURVEY SHEET NO. T-5678  
STATE OF MARYLAND  
CHESAPEAKE BAY, BUSH RIVER

Date of this report ----- August 7, 1939

INSTRUCTIONS:

The topography on this sheet is a part of Project HT-215, the instructions for which are dated March 4, 1938 and May 13, 1938.

CONTROL:

The control consists of twenty stations shown on this sheet by the triangulation symbol. The following is a list of the control and its source:

1. U. S. Coast & Geodetic Survey Triangulation

Maxwell Point - 3, 1935 ✓  
Water Tank (small) Edgewood Arsenal, 1939 ✓  
Water Tank (large) Edgewood Arsenal, 1939 ✓  
Rembolts House, East Chimney, 1898 ✓  
Airway Beacon 61-A, 1933 ✓  
Airway Beacon 61-B, 1933 ✓

2. U. S. Geological Survey - Bulletin 709-A

Primary Traverse Station No. 9, 1918

|   |   |   |              |
|---|---|---|--------------|
| " | " | " | No. 21, 1918 |
| " | " | " | No. 25, 1918 |
| " | " | " | No. 39, 1918 |
| " | " | " | No. 54, 1918 |
| " | " | " | No. 56, 1918 |
| " | " | " | No. 57, 1918 |
| " | " | " | No. 61, 1918 |
| " | " | " | No. 72, 1918 |

*Portions for these stations are not in files of geodetic Sec W.D.G. S. Bulletin 709 is attached at back.*

3. U. S. Army Engineers field observations. Geographic positions computed from the original data by Air Photographic Survey Party No. 2 and submitted by J. C. Partington U. S. Coast & Geodetic Survey in 1937

R-2, (U.S.E.), 1937

4. Plane coordinates furnished by the Ordinance Dept., U. S. Army, Aberdeen Proving Grounds, Maryland. Geographic positions computed by Air Photographic Survey Party No. 2 and submitted by L. W. Swanson, U. S. Coast and Geodetic Survey in 1939.

Oblique Camera Obscura, A.P.G. - *Ordinance Dept. U.S. Army*  
No. 1 Mirror Bombing Field, A.P.G. " " " "  
Tower "C", A.P.G. " " " "  
Tower "D", A.P.G. " " " "

All triangulation stations that were on the North American Datum were adjusted to the North American 1927 Datum. All triangulation stations were pricked on the photographs and were used in running the plot.

*See Review for U.S.G.S. Primary Traverse stations shown on 1935 surveys, not on this survey.*

*Portions of these stations are confidential (857 GTZ G 4048) since the portions cannot be furnished to public the stations will be removed from the sheet before publication. B.G.G. 2/18/40*

# RADIAL PLOT:

The radial plot on this sheet was run at two different times. The plot comprising the area north of the Pennsylvania Railroad and east of the Bush River, was run in conjunction with sheets 5674, 5675, 5676, and 5677, in March 1938. It was recommended by the Washington Office in June 1938, that the map drawing 5431 and part of 5430, previously executed in 1935, should be redrafted on this sheet for uniformity of drafting and better layout of sheets.

For this reason, a radial plot was made in conjunction with sheets 5679, 5680, and 5681, of the area south of the Pennsylvania Railroad on Gunpowder Neck, in June 1939, and both plots were tied together in common junction.

The celluloid template method was used in running both plots. A detailed description of the method used in running these plots is given in the descriptive report for sheet T-5677.

On this sheet well defined radial points were selected at intervals of about every three inches along the shoreline and about four well defined points per square mile on the inshore areas. These points were radial plotted, and together with the triangulation, formed the basis of the control for additional radial points, where needed, during the detailing of the sheet.

The radials on this sheet intersected exceptionally well, except at Abbey Point around station R-2, (U.S.E.), 1937. It was found from additional field inspection that this station was not pricked in the proper location on the photograph. This error was corrected, and radial points replotted at good intersections.

For the guidance of the reviewer, the green circles shown on the back side of the sheet indicate weak intersections of three radials, or in some cases only two radials. Blue circles indicate well located points of three or more radials.

## DETAIL:

The area covered by the first plot was, for the most part, field inspected prior to the receipt of instructions for field inspection and detailing of Chesapeake Bay Sheets, May 13, 1938. However, with a few corrections, the field inspection was complete enough to allow the compiler to detail according to those instructions. In general, all the detail shown on this sheet, is in accord-

An attempt was made on Gunpowder Neck, to trace detail on this sheet, from Map Drawing No. T-5431. It was found that the radial points, common on both sheets, would not exactly match up. This idea was discarded, and except for control, all information shown on this sheet was taken from field inspection and photographs.

Hydrographic signals were shown on this sheet, along the shoreline of the Bush River and Otter Point Creek. Since it is the understanding of this office, that the hydrographic survey of this area has been completed in the summer of 1938, and that

can be  
on the  
stop if needed  
BGP

The comparison of this sheet with sheets T-5430 and T-5431 agree<sup>well</sup> exceptionally good with shoreline and roads. The discrepancies, along the shoreline, could for the most part, be due to differences in the interpretation of the high waterline, especially in marshy areas. The location of roads are in very good agreement, except in a few places where they might be out as much as five meters. This is probably due to slight differences in radial plots and interpretation of physical features. There are a few additional roads shown on this sheet that do not appear on the old map drawings. <sup>survey</sup>

See review for more detailed discussion of differences between 1935 <sup>survey</sup> and this survey.

No comparison was made with the U. S. Geological Gunpowder Quadrangle, Chart 1226, or the Military Map No. 2654:7531/46: issued by the War Department, Corp of Engineers, U. S. Army. The scale of these maps were considered too small for good comparison.

#### JUNCTIONS:

This sheet forms a good junction with T-5676 on the North, T-5677 on the East, T-5681 on the South, and T-5680 on the West.

See review for note on junctions.

#### RECOVERABLE TOPOGRAPHIC STATIONS:

There are several observation towers in Aberdeen Proving Grounds, Edgewood Arsenal, and Fort Hoyle, not shown on chart # 1226, but have been located and shown on this sheet by 2 1/2 mm circles. These objects are of a recoverable nature, but have not been described on card form #524 since their position are of a confidential nature to the U. S. Army. *See page 7*

#### LANDMARKS:

Air Beacon # 61A should be charted.

Landmarks falling on this sheet are not recommended for charting because of their military importance, in connection with Aberdeen Proving Grounds, Edgewood Arsenal, and Fort Hoyle. *chart 1226*

The land mark designated as NORTH STACK in latitude 39° 23.9', longitude 76° 16.2', should be removed from the chart as the stack has now been destroyed. *Reported to standards 2/5/40*

#### GEOGRAPHIC NAMES:

Geographic Names shown on this sheet are listed on Form M234 herewith.

The names OLD BALTIMORE and CHELSEA is shown on the old Plane Table Surveys as small settlements of 3 or 4 houses, in what is now Aberdeen Proving Grounds. The names also appear on chart # 1226, but do not appear on the U. S. Geological Betterton Quadrangle. They are not shown on the air photographic survey since the houses and the old road system are now nonexistent. ✓

✓ RECOMMENDATION FOR FUTURE SURVEYS:

This sheet is believed to be complete in all detail of importance for charting, and no additional surveys are required.

The probable error is not greater than 5 meters for radial points shown in blue on the back of the sheet, and well defined objects along the water front. The error of other detail is probably not greater than 10 meters.

Respectfully submitted,

*William C. Russell*

William C. Russell,  
Jr. H. & G. E.

Forwarded approved:

L. W. SWANSON

Chief of Party.

by *James D. Jones*  
Jr H & G Eng'rs.

*Notes in red by T. M. Price, field rec. sect., at time of review, Jan. 6, 1940.*

## LANDMARKS FOR CHARTS

TO BE CHARTED }  
TO BE DELETED } STRIKE OUT ONE

193

I recommend that the following objects which have (*have not*) been inspected from seaward to determine their value as landmarks, be charted on (*deleted from*) the charts indicated.

The positions given have been checked after listing.

*Chief of Party.*

[illegible]

This form shall be prepared in accordance with 19.0 Field Memorandum, "LANDMARKS FOR CHARTS." The data should be considered for the charts of the area and not by individual field survey sheets. Information under each column heading should be given.

# GEOGRAPHIC NAMES

Survey No. T-5678

| GEOGRAPHIC NAMES |                        | Survey No. T-5678 |   | On Chart No. 1226 Revised to No. 1226-1<br>On previous survey No. T-5678-1<br>On U. S. Quadrangle Maps<br>From local information<br>On local Maps<br>P. O. Guide or Map<br>Rand McNally Atl.<br>U. S. Light List<br>Index Register No. 2377 |                           |   |   |   |   |                |   |    |  |  |
|------------------|------------------------|-------------------|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|---|---|---|---|----------------|---|----|--|--|
| Name on Survey   |                        | A                 | B | C                                                                                                                                                                                                                                           | D                         | E | F | G | H | I              | J | K  |  |  |
| ✓✓               | OTTER POINT CREEK      | ✓                 |   | ✓                                                                                                                                                                                                                                           | □×□                       |   | ✓ |   |   |                |   | 1  |  |  |
| ✓                | OTTER POINT            | ✓                 | ✓ |                                                                                                                                                                                                                                             | different location<br>1□× |   |   |   |   |                |   | 2  |  |  |
| ✓✓               | FLYING POINT           | ✓                 |   |                                                                                                                                                                                                                                             | 10□×                      |   |   |   |   |                |   | 3  |  |  |
| ✓✓               | GUM POINT              | ✓                 | ✓ | ✓                                                                                                                                                                                                                                           | 01                        |   | ✓ |   |   |                |   | 4  |  |  |
| ✓✓               | CHILBURY POINT         | ✓                 | ✓ | ✓                                                                                                                                                                                                                                           | 10                        |   |   |   |   |                |   | 5  |  |  |
| ✓✓               | BUSH RIVER             | ✓                 | ✓ | ✓                                                                                                                                                                                                                                           | 1□                        |   |   |   |   |                |   | 6  |  |  |
| ✓✓               | BUSH RIVER (R.R. sta.) | ✓                 | ✓ | ✓                                                                                                                                                                                                                                           | 40                        |   | ✓ |   |   |                |   | 7  |  |  |
| ✓✓               | SOD RUN                | ✓                 | ✓ |                                                                                                                                                                                                                                             | 10                        |   |   |   |   |                |   | 8  |  |  |
| ✓✓               | MONKS CREEK            | ✓                 | ✓ | ✓                                                                                                                                                                                                                                           | 10                        |   | ✓ |   |   |                |   | 9  |  |  |
| ✓✓               | FAIRVIEW POINT         | ✓                 | ✓ | ✓                                                                                                                                                                                                                                           | Fair Pt.<br>10            |   | ✓ |   |   |                |   | 10 |  |  |
| ✓✓               | LAUDERICK CREEK        | ✓                 | ✓ | ✓                                                                                                                                                                                                                                           | 10□                       |   | ✓ |   |   |                |   | 11 |  |  |
| ✓✓               | EAGLE POINT            | ✓                 | ✓ | ✓                                                                                                                                                                                                                                           | 10                        |   |   |   |   |                |   | 12 |  |  |
| ✓✓               | TAPLER POINT           | ✓                 | ✓ | ✓                                                                                                                                                                                                                                           | 10                        |   |   |   |   |                |   | 13 |  |  |
| ✓✓               | KINGS CREEK            | ✓                 | ✓ | ✓                                                                                                                                                                                                                                           | 10                        |   | ✓ |   |   |                |   | 14 |  |  |
| ✓✓               | BEACH POINT            | ✓                 | ✓ | ✓                                                                                                                                                                                                                                           | 1                         |   | ✓ |   |   |                |   | 15 |  |  |
| ✓✓               | WILSON POINT           | ✓                 | ✓ | ✓                                                                                                                                                                                                                                           | 1                         |   | ✓ |   |   |                |   | 16 |  |  |
| ✓✓               | DOVES COVE             | ✓                 | ✓ | ✓                                                                                                                                                                                                                                           | 1                         |   | ✓ |   |   |                |   | 17 |  |  |
| ✓✓               | COOPER CREEK           | ✓                 | ✓ | ✓                                                                                                                                                                                                                                           | 1                         |   | ✓ |   |   |                |   | 18 |  |  |
| ✓✓               | BRIERY POINT           | ✓                 | ✓ | Briery Pt.<br>✓                                                                                                                                                                                                                             | 1                         |   |   |   |   |                |   | 19 |  |  |
| ✓✓               | MAXWELL POINT          | ✓                 | ✓ | ✓                                                                                                                                                                                                                                           | 1                         |   | ✓ |   |   |                |   | 20 |  |  |
| ✓✓               | SWADERICK CREEK        | ✓                 | ✓ | ✓                                                                                                                                                                                                                                           | 1                         |   | ✓ |   |   |                |   | 21 |  |  |
| ✓✓               | WRIGHT CREEK           | ✓                 | ✓ | ✓                                                                                                                                                                                                                                           | 1                         |   | ✓ |   |   |                |   | 22 |  |  |
| ✓✓               | ABBAY POINT            | ✓                 | ✓ | ✓                                                                                                                                                                                                                                           | 14<br>14<br>14            |   | ✓ |   |   |                |   | 23 |  |  |
| ✓✓               | ABBAY CREEK            | ✓                 | ✓ |                                                                                                                                                                                                                                             | 14<br>14<br>14            |   |   |   |   | Abbey I. Creek |   | 24 |  |  |
| ✓✓               | MONKS ISLAND           | ✓                 | ✓ |                                                                                                                                                                                                                                             | 14<br>14                  |   |   |   | ✓ |                |   | 25 |  |  |
| ✓✓               | COD CREEK              | ✓                 | ✓ |                                                                                                                                                                                                                                             |                           |   |   |   | ✓ |                |   | 26 |  |  |

## Remarks

## Decisions

|    |                                                                            |                                                                                    |
|----|----------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| 1  |                                                                            | 394762                                                                             |
| 2  | Other side of Otter Point Creek                                            | { Shown on sheet 5678<br>in correct location<br>on N. Bank of Otter<br>Point Creek |
| 3  |                                                                            |                                                                                    |
| 4  |                                                                            |                                                                                    |
| 5  |                                                                            | 394762 U.S.G.B.                                                                    |
| 6  |                                                                            | 393762                                                                             |
| 7  |                                                                            | 394762                                                                             |
| 8  | SOD CREEK - U.S.G.S. Quad. Betterton Md.<br>P. O. Map, <u>Hartford</u> Co. | "                                                                                  |
| 9  | Hartford Co.<br>T.M.P.                                                     | "                                                                                  |
| 10 |                                                                            | "                                                                                  |
| 11 | Local information from:                                                    | "                                                                                  |
| 12 | ✓ Mr. Herbert Reynolds, Havre De Grace, Md. ✓                              | "                                                                                  |
| 13 | 7 Mr. W. R. Cohee, Edgewood, Md.                                           | 393762 U.S.G.B.                                                                    |
| 14 | ⊙ Mr. Joseph Dimmang, Abingdon, Md.                                        | "                                                                                  |
| 15 | X Mr. Charles E. Smith, Abingdon, Md. (27 years local knowledge)           | "                                                                                  |
| 16 | ⊙ Mr. R. H. Leight, Abingdon, Md. (52 years local knowledge)               | U.S.G.B.                                                                           |
| 17 |                                                                            | U.S.G.B.                                                                           |
| 18 |                                                                            | "                                                                                  |
| 19 |                                                                            | U.S.G.B.                                                                           |
| 20 |                                                                            | 393762                                                                             |
| 21 |                                                                            | U.S.G.B.                                                                           |
| 22 |                                                                            | "                                                                                  |
| 23 | ABBEYS POINT - U. S. Light List                                            | 393762                                                                             |
| 24 |                                                                            | "                                                                                  |
| 25 |                                                                            | "                                                                                  |
| 26 |                                                                            | 393762                                                                             |
| 27 |                                                                            | U.S.G.B.                                                                           |

# GEOGRAPHIC NAMES

Survey No. T-5618

| Name on Survey             | <div> <div>On Chart No. 1726 Revised to May 6, 1944</div> <div>On previous survey No. T-5431-T-5432</div> <div>On U. S. quadrang. Maps</div> <div>From local information</div> <div>On local Maps</div> <div>P. O. Guide or Map</div> <div>Rand McNally Atlas</div> <div>U. S. Light List</div> </div> |    |    |    |    |    |    |    | Sheet No. 2377 |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|----|----|----|----------------|
|                            | A.                                                                                                                                                                                                                                                                                                     | B. | C. | D. | E. | F. | G. | H. |                |
| ✓ REDMON COVE ✓            | ✓                                                                                                                                                                                                                                                                                                      |    | ✓  | ✓  |    |    |    |    | 1              |
| ✓ ROMNEY CREEK ✓           | ✓                                                                                                                                                                                                                                                                                                      |    | ✓  | ✓  |    |    |    |    | 2              |
| ✓ POND POINT ✓             | ✓                                                                                                                                                                                                                                                                                                      | ✓  |    | ✓  |    |    |    |    | 3              |
| ✓ CANAL CREEK ✓            | ✓                                                                                                                                                                                                                                                                                                      | ✓  | ✓  |    |    |    |    |    | 4              |
| ✓ EDGEWOOD ✓               | ✓                                                                                                                                                                                                                                                                                                      |    | ✓  |    |    |    |    |    | 5              |
| ✓ GUNPOWDER RIVER ✓        | ✓                                                                                                                                                                                                                                                                                                      | ✓  | ✓  |    |    |    |    |    | 6              |
| ✓ GUNPOWDER NECK ✓         | ✓                                                                                                                                                                                                                                                                                                      | ✓  | ✓  |    |    |    |    |    | 7              |
| OLD BALTIMORE              | ✓                                                                                                                                                                                                                                                                                                      | ✓  |    |    |    |    |    |    | 8              |
| CHELSEA                    | ✓                                                                                                                                                                                                                                                                                                      | ✓  |    |    |    |    |    |    | 9              |
| ✓ Aberdeen Proving Grounds |                                                                                                                                                                                                                                                                                                        |    |    |    |    |    |    |    | 10             |
| ✓ Edgewood Arsenal         |                                                                                                                                                                                                                                                                                                        |    |    |    |    |    |    |    | 11             |
| ✓ Fort Hoyle               |                                                                                                                                                                                                                                                                                                        |    |    |    |    |    |    |    | 12             |
| Barren Pt                  |                                                                                                                                                                                                                                                                                                        |    |    |    |    |    |    |    | 13             |
| Towner Cove ✓              |                                                                                                                                                                                                                                                                                                        |    |    |    |    |    |    |    | 14             |
|                            |                                                                                                                                                                                                                                                                                                        |    |    |    |    |    |    |    | 15             |
|                            |                                                                                                                                                                                                                                                                                                        |    |    |    |    |    |    |    | 16             |
|                            |                                                                                                                                                                                                                                                                                                        |    |    |    |    |    |    |    | 17             |
|                            |                                                                                                                                                                                                                                                                                                        |    |    |    |    |    |    |    | 18             |
|                            |                                                                                                                                                                                                                                                                                                        |    |    |    |    |    |    |    | 19             |
|                            |                                                                                                                                                                                                                                                                                                        |    |    |    |    |    |    |    | 20             |
|                            |                                                                                                                                                                                                                                                                                                        |    |    |    |    |    |    |    | 21             |
|                            |                                                                                                                                                                                                                                                                                                        |    |    |    |    |    |    |    | 22             |
|                            |                                                                                                                                                                                                                                                                                                        |    |    |    |    |    |    |    | 23             |
|                            |                                                                                                                                                                                                                                                                                                        |    |    |    |    |    |    |    | 24             |
|                            |                                                                                                                                                                                                                                                                                                        |    |    |    |    |    |    |    | 25             |
|                            |                                                                                                                                                                                                                                                                                                        |    |    |    |    |    |    |    | 26             |
|                            |                                                                                                                                                                                                                                                                                                        |    |    |    |    |    |    |    | 27             |

## Remarks

## Decisions

|    |                                            |                                                            |
|----|--------------------------------------------|------------------------------------------------------------|
| 1  |                                            | 393 762                                                    |
| 2  |                                            | 393 761 U.S.G.B.                                           |
| 3  |                                            | 393 762                                                    |
| 4  |                                            | 393 7                                                      |
| 5  |                                            | 394 762                                                    |
| 6  |                                            | 393 763                                                    |
| 7  |                                            | 393 762                                                    |
| 8  | Not shown on this sheet (see Desc. Report) | 394 762                                                    |
| 9  | " " " " " " " "                            | " (Not shown on T5678 as part of Aberdeen proving grounds) |
| 10 |                                            | 394 761                                                    |
| 11 |                                            | 393 763                                                    |
| 12 |                                            | 393 763                                                    |
| 13 |                                            | 393 762                                                    |
| 14 |                                            | "                                                          |
| 15 |                                            |                                                            |
| 16 |                                            |                                                            |
| 17 |                                            |                                                            |
| 18 |                                            |                                                            |
| 19 |                                            |                                                            |
| 20 |                                            |                                                            |
| 21 |                                            |                                                            |
| 22 |                                            |                                                            |
| 23 |                                            |                                                            |
| 24 |                                            |                                                            |
| 25 |                                            |                                                            |
| 26 |                                            |                                                            |
| 27 |                                            |                                                            |

## PLANE COORDINATE GRID SYSTEM

Positions of grid intersections used for fitting the grid to this compilation were computed by Division of Geodesy and the computation forms are included in this report.

Grid inked on machine by S. K.

Points used for plotting grid:  
Minute Intersections

$\phi$  39-27  
 $\lambda$  76-19

$\phi$  39-24  
 $\lambda$  76-16

$\phi$  39-21  
 $\lambda$  76-19

$x$  \_\_\_\_\_  
 $y$  \_\_\_\_\_

## REVIEW OF AIR PHOTOGRAPHIC SURVEY T-5678

There are no contemporary planetable surveys in this area.

### Previous Topographic Surveys

|                       |                        |
|-----------------------|------------------------|
| T-190 (1845) 1:20,000 | T-2308 (1898) 1:20,000 |
| T-197 (1845) 1:20,000 | T-2377 (1898) 1:20,000 |
| T-213 (1845) 1:20,000 | T-2366 (1898) 1:10,000 |

T-5678 is adequate to supersede the sections of the above surveys which it covers except for contours and bluff lines.

T-5430 (1935) 1:10,000, and T-5431 (1933) 1:10,000  
Air Photographic surveys: T-5678 is adequate to supersede the section of T-5430 and T-5431 which it covers.

There are numerous differences of 0 to 20 meters in shoreline position between T-5678 and T-5430 and T-5431. These are, in some cases, due to changes but are largely due to differences in shoreline interpretation. The later photographs are ~~shown~~ as regards high water line and T-5678 is accepted as correct.

Several U. S. Geological Survey Traverse stations shown on T-5430 and T-5431 are not shown on T-5678. These were not recovered or used on T-5678.

### Hydrographic Surveys.

H-6367 (1938) 1:10,000.

H-6367 has been compared with T-5678 and the two surveys are in agreement.

A number of small piers, piling, etc., which were not visible on the photographs have been added to T-5678 from H-6367.

### Confidential Information.

T-5678 is partly within the Aberdeen Proving Ground. Confidential copies of T-5678 have been furnished the Commanding Officer, Aberdeen Proving Ground and a confidential plate is filed in the vault for possible future printing. Confidential information has been painted off of the negatives in accordance with instructions from the Commanding Officer, Aberdeen

Proving Ground and a new non-confidential plate made for printing the file copy and copies for sale.

The instructions regarding the removal of confidential details consisted of notes made on a copy of T-5678. This copy has been destroyed. The original celluloid drawing and all confidential prints of T-5678 have been destroyed.

Instructions regarding removal of confidential information from T-5678 have been reported to the Nautical Chart Section.

Chart 1226 (April 5, 1939).

See page 5 of the descriptive report regarding landmarks.

Reviewed in the office by - B. G. Jones.

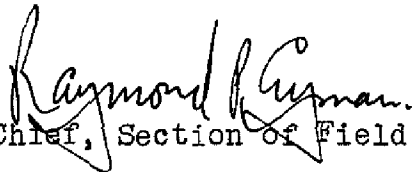
Examined and approved:



Thos. B. Reed,  
Chief, Section of Field Records.



Chief, Division of Charts.



Chief, Section of Field Work.



Chief, Division of H. & T.

DEPARTMENT OF THE INTERIOR

FRANKLIN K. LANE, Secretary

UNITED STATES GEOLOGICAL SURVEY

GEORGE OTIS SMITH, Director

BULLETIN 709—A

TRIANGULATION AND PRIMARY TRAVERSE  
IN DELAWARE, MARYLAND, AND  
WEST VIRGINIA, 1916-1918

INCLUDING RESULTS OF LEVELING IN GUNPOWDER  
QUADRANGLE, MARYLAND, IN 1918

R. B. MARSHALL, CHIEF GEOGRAPHER

Triangulation and primary traverse, 1916-1918  
(Pages 1-22)



WASHINGTON

GOVERNMENT PRINTING OFFICE

1919

DEPARTMENT OF THE INTERIOR

FRANKLIN K. LANE, Secretary

UNITED STATES GEOLOGICAL SURVEY

GEORGE OTIS SMITH, Director

Bulletin 709—A

TRIANGULATION AND PRIMARY TRAVERSE IN  
DELAWARE, MARYLAND, AND WEST  
VIRGINIA, 1916-1918

INCLUDING RESULTS OF LEVELING IN GUNPOWDER  
QUADRANGLE, MARYLAND, IN 1918

R. B. MARSHALL, CHIEF GEOGRAPHER

Triangulation and primary traverse, 1916-1918  
(Pages 1-22)



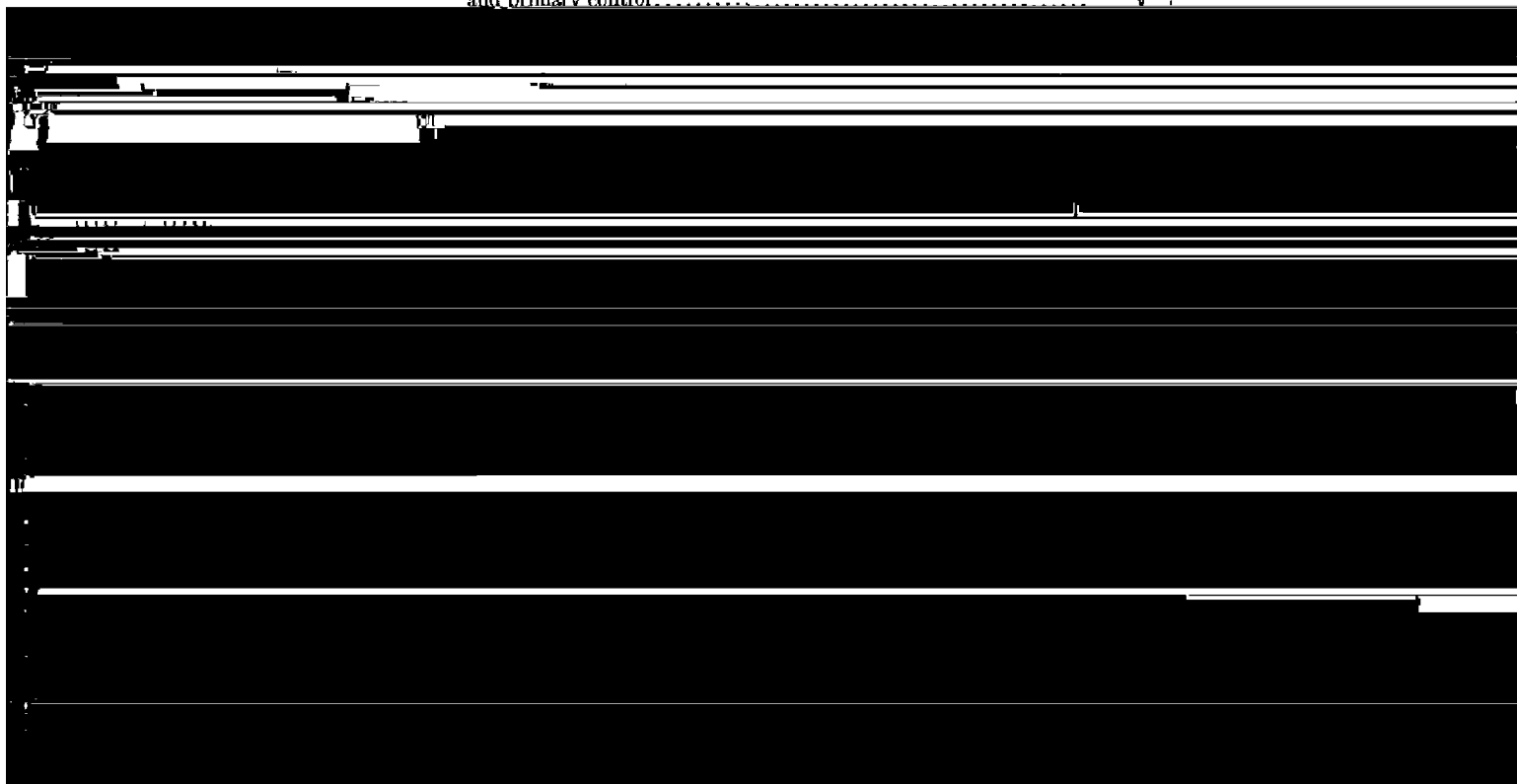
WASHINGTON  
GOVERNMENT PRINTING OFFICE  
1919

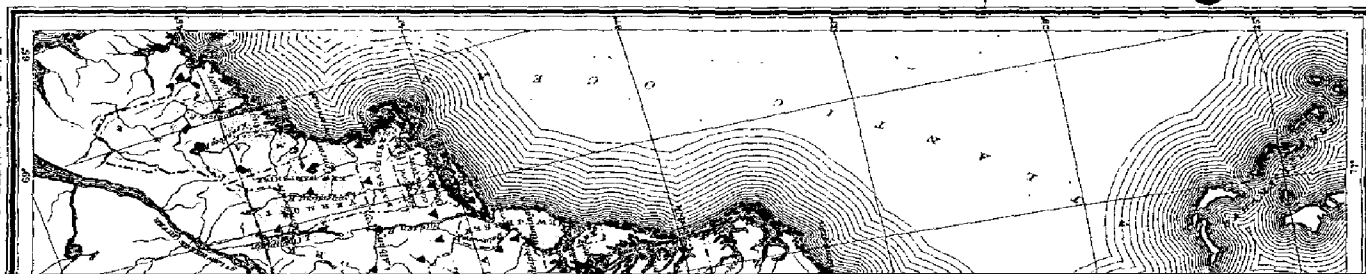
## CONTENTS.

|                             | Page. |
|-----------------------------|-------|
| Introduction.....           | v     |
| Personnel.....              | v     |
| Datum.....                  | v     |
| Station marks.....          | v     |
| Summary.....                | vi    |
| Delaware.....               | 1     |
| Maryland.....               | 5     |
| Maryland-West Virginia..... | 16    |

## ILLUSTRATIONS.

|                                                                                                         | Page. |
|---------------------------------------------------------------------------------------------------------|-------|
| PLATE I. Map of the United States, showing condition of astronomic location<br>and primary control..... | v     |





# TRIANGULATION AND PRIMARY TRAVERSE, 1916-1918.

R. B. MARSHALL, Chief Geographer.

## INTRODUCTION.

### PERSONNEL.

*Field work.*—The field work of primary control, the computed results of which are given in the following pages, was carried on

## STATION MARKS.

Permanent marks are placed at all occupied triangulation stations and at certain of the primary traverse stations, from 3 to 8 miles apart.

These marks are of the form adopted for leveling bench marks, and in many places the elevation as well as the latitude and longitude has been determined. The marks are of two forms. The first form is a circular bronze or aluminum tablet (*C* and *E*, Pl. II),  $3\frac{1}{2}$  inches in diameter and one-fourth inch thick, having a 3-inch stem, which is cemented in a drill hole in solid rock, in the wall of some public building, bridge abutment, or other substantial masonry structure. The second form (*F*, Pl. II), set in the ground where no masonry or rock is available, consists of a hollow wrought-iron post  $3\frac{1}{2}$  inches in outside diameter and 4 feet long. The bottom is spread out to a width of 10 inches in order to give a firm bearing on the earth. A bronze or aluminum-bronze cap is riveted upon the top of the post. The tablets, as well as the caps on the iron posts, are appropriately lettered, and where States have cooperated in the work the fact of such cooperation is indicated by the addition of the State name (*G*, Pl. II).

## SUMMARY.

*Summary of triangulation and primary traverse, 1916-1918.*

| Locality.                                   | Triangulation stations. | Traverse stations. |
|---------------------------------------------|-------------------------|--------------------|
| Arizona.....                                |                         |                    |
| California.....                             | 207                     |                    |
| Delaware-Maryland-West Virginia.....        | 17                      | 259                |
| Florida.....                                |                         | 552                |
| Georgia.....                                |                         | 4,323              |
| Idaho-Montana.....                          | 38                      |                    |
| Illinois-Wisconsin.....                     |                         | 619                |
| Iowa-Kansas-Missouri-Nebraska-Oklahoma..... |                         | 1,505              |
| Kentucky-Tennessee.....                     | 17                      | 468                |
| Maine-New Hampshire.....                    | 99                      |                    |
| Michigan.....                               |                         | 692                |
| Nevada.....                                 | 14                      |                    |
| New Mexico.....                             |                         |                    |
| New York.....                               | 365                     |                    |
| North Carolina.....                         |                         |                    |
| Oregon-Washington.....                      | 79                      | 1,396              |
| South Carolina.....                         |                         |                    |
| Texas.....                                  |                         |                    |
| Virginia.....                               |                         | 2,489              |



# DELAWARE.

## PRIMARY TRAVERSE.

Cape Henlopen, Cedar Creek, Harrington, Millsboro, and Rehoboth quadrangles.

### KENT AND SUSSEX COUNTIES.

The following geographic positions on North American datum are based upon U. S. Coast and Geodetic Survey triangulation stations and U. S. Geological Survey primary traverse positions in this locality.

The work was done by J. H. Wilson in 1917.

For additional geographic positions in Delaware, see U. S. Geological Survey Bulletins 181, 245, and 496, and U. S. Coast and Geodetic Survey Report for 1893, Part II. The U. S. Coast and Geodetic Survey also has many unpublished data.

### CAPE HENLOPEN QUADRANGLE.

Near Broad Kiln Creek.

| Station.                                                                                                                                                                                                | Latitude.  | Longitude. | Distance between stations. |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------------|----------------------------|
| Broad Kiln Creek, 0.75 mile southeast of drawbridge over, at road forks south, on east side of road, 1 foot from fence around small chicken yard; iron post stamped "Prim. Trav. Sta. No. 6, 1917"..... | 38 47 05.4 | 75 14 27.8 | Feet. ....                 |
| Road crossing on north-south road; 310 feet east is crossing on east-west road.....                                                                                                                     | 38 46 09.9 | 75 14 19.9 | 5,653                      |

### CEDAR CREEK QUADRANGLE.

East along highways near north border of quadrangle.

| Station.                                                                                                               | Latitude.  | Longitude. | Distance between stations. |
|------------------------------------------------------------------------------------------------------------------------|------------|------------|----------------------------|
| Browns Branch, center of bridge over.....                                                                              | 38 53 55.4 | 75 23 49.4 | Feet. ....                 |
| Postles schoolhouse, 1,600 feet south of; road fork to west.....                                                       | 38 58 42.6 | 75 27 05.7 | 8,294                      |
| Postles schoolhouse, 0.5 mile north of; road south.....                                                                | 38 59 22.4 | 75 26 49.5 | 4,220                      |
| Crossroads.....                                                                                                        | 38 59 40.6 | 75 25 26.0 | 6,847                      |
| Thompsonville, at northwest corner of Thompson's store; iron post stamped "Prim. Trav. Sta. No. 4, 1917".....          | 38 59 57.5 | 75 23 23.6 | 9,808                      |
| Crossroads.....                                                                                                        | 38 59 27.9 | 75 22 17.4 | 6,027                      |
| Road forks.....                                                                                                        | 38 59 45.1 | 75 21 28.7 | 4,351                      |
| Stone triangulation station on beach of Delaware Bay, in Kent County, on land of William McColl, 10 miles from town of |            |            |                            |

## CEDAR CREEK QUADRANGLE—Continued.

## East along Pennsylvania Railroad from Harrington to Milford.

| Station.                                             | Latitude.  | Longitude. | Distance<br>between<br>stations. |
|------------------------------------------------------|------------|------------|----------------------------------|
|                                                      | ° ' "      | ° ' "      | Feet.                            |
| Road crossing.....                                   | 38 55 04.2 | 75 29 33.9 | .....                            |
| Road crossing, 870 feet west of milepost 6.....      | 38 55 06.9 | 75 28 28.8 | 5,150                            |
| Road crossing.....                                   | 38 55 08.7 | 75 27 44.9 | 3,475                            |
| Road crossing.....                                   | 38 55 02.4 | 75 26 58.5 | 3,722                            |
| Road crossing.....                                   | 38 54 54.7 | 75 26 37.4 | 1,840                            |
| Milford, road crossing at depot, between tracks..... | 38 54 39.7 | 75 25 58.5 | 3,431                            |

## South along Pennsylvania Railroad from Milford to Redden.

|                                                                                                                                                                                           |            |            |        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------------|--------|
| Road crossing, 630 feet south of milepost 9.....                                                                                                                                          | 38 53 57.9 | 75 25 35.4 | 4,606  |
| Road crossing, second class, 270 feet north of milepost 10.....                                                                                                                           | 38 53 15.2 | 75 25 28.8 | 4,373  |
| Lincoln City, road crossing just south of depot.....                                                                                                                                      | 38 52 09.0 | 75 25 27.0 | 6,700  |
| Road crossing.....                                                                                                                                                                        | 38 49 56.8 | 75 25 26.5 | 13,330 |
| Ellendale, crossing of Pennsylvania and Maryland, Delaware & Virginia railroads.....                                                                                                      | 38 48 17.8 | 75 25 23.8 | 10,010 |
| Milepost 17; center of track.....                                                                                                                                                         | 38 47 07.5 | 75 25 21.9 | 7,420  |
| Robbins, road crossing at depot.....                                                                                                                                                      | 38 45 43.8 | 75 25 19.6 | 8,470  |
| Road crossing.....                                                                                                                                                                        | 38 45 00.3 | 75 25 13.4 | 4,400  |
| Redden, 25 feet from northeast corner of station, 57 feet east of center of railroad track, 12 feet south of center of public road; iron post stamped "Prim. Trav. Sta. No. 8, 1910"..... | 38 44 30.6 | 75 25 05.5 | 3,174  |

## East along Maryland, Delaware &amp; Virginia Railway to Ellendale.

|                                                                                      |            |            |       |
|--------------------------------------------------------------------------------------|------------|------------|-------|
| Oakley, road crossing at depot.....                                                  | 38 48 16.5 | 75 29 19.2 | ..... |
| Road crossing.....                                                                   | 38 48 16.9 | 75 28 04.0 | 5,950 |
| Road crossing.....                                                                   | 38 48 17.2 | 75 27 25.6 | 3,035 |
| Road crossing.....                                                                   | 38 48 17.6 | 75 26 08.8 | 6,235 |
| Ellendale, crossing of Pennsylvania and Maryland, Delaware & Virginia railroads..... | 38 48 17.8 | 75 25 23.8 | 3,400 |

## Southeast along highways and Maryland, Delaware &amp; Virginia Railway in southeastern part of quadrangle.

|                                                                                                                                                                |            |            |       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------------|-------|
| Lincoln City, road crossing just south of depot.....                                                                                                           | 38 52 09.0 | 75 25 27.0 | ..... |
| Road forks, 1.25 miles east of Lincoln City.....                                                                                                               | 38 52 15.3 | 75 24 09.0 | 6,918 |
| Road forks, in line with roads northwest and northeast.....                                                                                                    | 38 51 43.3 | 75 23 18.0 | 4,628 |
| Anderson's crossroads, 3.5 miles southeast of Lincoln City, on Milford-Milton road, in southwest corner; iron post stamped "Prim. Trav. Sta. No. 5, 1917"..... | 38 51 23.0 | 75 22 13.3 | 5,519 |
| Calhoun schoolhouse, crossroads just southeast of.....                                                                                                         | 38 50 37.0 | 75 21 37.6 | 5,441 |
| Crossroads, Bennett's mail box is in northeast corner.....                                                                                                     | 38 50 03.6 | 75 20 45.5 | 5,333 |
| T road south, 500 feet east is road northwest.....                                                                                                             | 38 49 56.7 | 75 19 38.9 | 5,316 |
| Waplesold mill, 1,400 feet north of, in center of triangle at road forks; large hickory tree.....                                                              | 38 49 47.0 | 75 18 30.2 | 5,525 |
| T road, east, 250 feet south is road west.....                                                                                                                 | 38 48 57.9 | 75 18 17.4 | 5,072 |
| Mail box of John C. Lofland; in center of road forks.....                                                                                                      | 38 49 12.5 | 75 17 20.2 | 4,761 |
| Cades Branch, bridge over.....                                                                                                                                 | 38 48 46.0 | 75 16 56.4 | 3,275 |
| Zion Church, 0.5 mile east of, at end of drawbridge; center of triangle at road forks.....                                                                     | 38 48 20.5 | 75 16 16.6 | 4,079 |
| Broad Kiln Creek, center of drawbridge over.....                                                                                                               | 38 47 28.7 | 75 15 04.9 | 7,725 |
| Beaver Dam Creek, west end of railroad trestle over.....                                                                                                       | 38 46 10.4 | 75 15 23.5 | ..... |
| Road crossing.....                                                                                                                                             | 38 46 11.0 | 75 16 25.7 | 4,550 |
| Road crossing at brick yard.....                                                                                                                               | 38 46 11.3 | 75 17 04.6 | 3,240 |
| Road crossing, northwest and southeast road.....                                                                                                               | 38 46 11.6 | 75 17 40.0 | 2,800 |
| Milton, road crossing at depot.....                                                                                                                            | 38 46 12.2 | 75 18 48.5 | 5,425 |
| Milton, 0.5 mile south of, four corners.....                                                                                                                   | 38 45 55.5 | 75 18 57.0 | 1,820 |

Magnetic declination near north border of quadrangle, 7° 30' W.; for southeast part of quadrangle, 7° 14' W.

## HARRINGTON QUADRANGLE.

Southeast along highways near north border of quadrangle.

| Station.                                                                                                                                                                                                                                                                      | Latitude.   | Longitude.  | Distance between stations. |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|----------------------------|
| Kent triangulation station; station is in Kent County, about 1 mile north of the Hollandville post office. It is on farm of Llewellyn Dill, in the potato patch just back or east of the apple orchard and within 75 feet of the cattle pound and barn. Tripod 125 feet high. | 38 59 37.33 | 75 40 42.62 | Feet.                      |
| Hollandville, 300 feet northeast of road west; road southeast.                                                                                                                                                                                                                | 38 59 07.8  | 75 39 59.2  | 4,543                      |
| Hollandville, 1.80 miles southeast of, at road forks; center of triangle.                                                                                                                                                                                                     | 38 58 12.4  | 75 38 16.6  | 9,856                      |
| Maston's Corners, 190 feet west of crossroads, at northwest corner of schoolhouse yard; iron post stamped "Prim. Trav. Sta. No. 1, 1917".                                                                                                                                     | 38 58 07.3  | 75 37 01.6  | 5,950                      |
| William Paskey's mail box; T road north at.                                                                                                                                                                                                                                   | 38 58 32.1  | 75 36 15.7  | 4,406                      |
| Maston's Corners, 1.60 miles southeast of, at road forks, 20 feet west of mail box, in line with road south; on telephone pole.                                                                                                                                               | 38 58 32.0  | 75 35 23.2  | 4,147                      |
| Maston's Corners, 2.30 miles east of, at colored schoolhouse, railroad crossing; southbound track.                                                                                                                                                                            | 38 58 59.1  | 75 34 45.6  | 3,985                      |

## Along Pennsylvania Railroad.

|                                                                                                                        |             |             |       |
|------------------------------------------------------------------------------------------------------------------------|-------------|-------------|-------|
| Milepost 36, railroad crossing; southbound track.                                                                      | 38 58 19.2  | 75 34 45.4  | 4,040 |
| Harrington, 1.50 miles north of, railroad crossing; southbound track.                                                  | 38 56 58.2  | 75 34 42.8  | 8,199 |
| Harrington, at south end of depot platform; crossing of southbound track.                                              | 38 55 24.6  | 75 34 39.7  | 9,480 |
| Milepost 32, at second-class crossing; southbound track.                                                               | 38 54 50.6  | 75 34 38.6  | 3,440 |
| Milepost 32, 1.20 miles south of, at road crossing; southbound track.                                                  | 38 53 48.2  | 75 34 36.6  | 6,816 |
| Farmington, 1.20 miles north of; railroad crossing.                                                                    | 38 53 15.1  | 75 34 35.5  | 3,555 |
| Farmington, just north of depot, at road crossing; southbound track.                                                   | 38 52 09.7  | 75 34 47.1  | 6,481 |
| Farmington, 1 mile south of, at road crossing; northbound track.                                                       | 38 51 20.3  | 75 34 57.4  | 5,066 |
| Farmington, 2.10 miles south of, at second-class road crossing; northbound track.                                      | 38 50 15.7  | 75 35 11.1  | 6,626 |
| Greenwood, 1.80 miles north of, at Kent-Sussex county line; northbound track.                                          | 38 50 04.5  | 75 35 13.5  | 1,156 |
| Greenwood, 1 mile north of, at road crossing; northbound track.                                                        | 38 49 08.1  | 75 35 25.4  | 5,780 |
| Greenwood, junction of Pennsylvania Railroad and Maryland, Delaware & Virginia Railway.                                | 38 48 32.0  | 75 35 33.0  | 3,709 |
| Greenwood, 1.50 miles south of, at road crossing; northbound track.                                                    | 38 47 18.4  | 75 35 48.6  | 7,541 |
| Greenwood, 2.60 miles south of, at second-class road crossing; northbound track.                                       | 38 46 21.6  | 75 36 00.6  | 5,831 |
| Bridgeville, 1.40 miles north of, at road crossing; northbound track.                                                  | 38 45 40.7  | 75 36 09.2  | 4,195 |
| Bridgeville, 0.70 mile north of, 800 feet north of yard-limit sign, at road crossing; northbound track.                | 38 45 07.1  | 75 36 16.3  | 3,445 |
| Bridgeville, at railroad station, in doorstep of ladies' waiting room; copper bolt (Pennsylvania Railroad bench mark). | 38 44 31.30 | 75 36 23.00 | 3,673 |

## West along highways through center of quadrangle.

|                                                                                                           |             |             |       |
|-----------------------------------------------------------------------------------------------------------|-------------|-------------|-------|
| T road north.                                                                                             | 38 51 50.4  | 75 35 47.7  | ..... |
| J. P. Griffith's mail box, road south at.                                                                 | 38 51 34.7  | 75 36 44.1  | 4,734 |
| Andrewville, at southwest corner of crossroads; iron post stamped "Prim. Trav. Sta. No. 2, 1917".         | 38 51 41.5  | 75 38 08.4  | 6,704 |
| Marsh Hope Creek, center of bridge over.                                                                  | 38 52 10.7  | 75 39 00.0  | 5,034 |
| T road southwest.                                                                                         | 38 52 19.8  | 75 39 17.6  | 1,673 |
| T road east; center of triangle.                                                                          | 38 51 52.1  | 75 40 43.3  | 7,331 |
| Road forks.                                                                                               | 38 51 43.2  | 75 40 54.5  | 1,250 |
| Big Pine, center of crossroads.                                                                           | 38 51 02.7  | 75 41 42.4  | 5,582 |
| Public forks, road north at.                                                                              | 38 50 56.5  | 75 42 33.4  | 4,077 |
| Maryland-Delaware State line, 18 feet west of center of crossroads (State line road belongs to Delaware). | 38 50 48.5  | 75 43 28.1  | 4,402 |
| Mail box 57, center of crossroads at (in Maryland).                                                       | 38 51 25.1  | 75 44 02.1  | 4,585 |
| T road north (in Maryland).                                                                               | 38 51 27.6  | 75 45 26.2  | 6,654 |
| Hobbs, Md., railroad crossing at depot (B. 245).                                                          | 38 51 35.60 | 75 47 06.10 | 7,942 |

## TRIANGULATION AND PRIMARY TRAVERSE, 1916-1918.

## HARRINGTON QUADRANGLE—Continued.

East along highways near north border of quadrangle.

| Station.                                                                                                               | Latitude.  | Longitude. | Distance between stations. |
|------------------------------------------------------------------------------------------------------------------------|------------|------------|----------------------------|
|                                                                                                                        | " ' "      | " ' "      | <i>Feet.</i>               |
| Railroad crossing (sta. 32, previously tabulated).....                                                                 | 33 58 59.1 | 75 34 46.6 | .....                      |
| Rice's schoolhouse; T road south at.....                                                                               | 33 59 02.4 | 75 34 16.0 | 2,434                      |
| Chimney Hill; T road northwest at.....                                                                                 | 33 59 26.4 | 75 32 38.7 | 8,059                      |
| Killeen's mill; bridge over mill race at.....                                                                          | 33 58 57.3 | 75 31 50.4 | 4,815                      |
| Crossroads.....                                                                                                        | 33 58 31.1 | 75 31 36.8 | 2,867                      |
| Law's Church and schoolhouse, crossroads at, in center of triangle; iron post stamped, "Prim. Trav. Sta. No. 3, 1917". | 33 58 42.4 | 75 30 03.3 | 7,465                      |

East along Pennsylvania Railroad from Harrington.

|                                                        |             |             |       |
|--------------------------------------------------------|-------------|-------------|-------|
| Harrington, railroad crossing.....                     | 33 55 21.55 | 75 34 39.73 | ..... |
| Milepost 1, second-class road crossing at.....         | 33 54 53.8  | 75 33 49.6  | 5,040 |
| Milepost 2, about 400 feet east of, road crossing..... | 33 54 56.6  | 75 22 38.5  | 5,630 |
| Road crossing.....                                     | 33 55 00.8  | 75 30 56.6  | 8,065 |
| Houston, road crossing at depot.....                   | 33 55 02.3  | 75 30 19.2  | 2,955 |

East along Maryland, Delaware &amp; Virginia Railway from Greenwood.

|                                                             |             |             |       |
|-------------------------------------------------------------|-------------|-------------|-------|
| Greenwood, railroad junction at (previously tabulated)..... | 33 43 31.96 | 75 35 33.02 | ..... |
| Road crossing.....                                          | 33 48 21.1  | 75 34 33.0  | 4,876 |
| Road crossing.....                                          | 33 48 15.0  | 75 33 36.2  | 4,535 |
| Road crossing.....                                          | 33 48 15.2  | 75 32 48.4  | 3,780 |
| Owens, road crossing at station.....                        | 33 48 15.7  | 75 31 40.8  | 5,550 |
| Road crossing.....                                          | 33 43 16.2  | 75 30 06.6  | 7,460 |

Magnetic declination near north border of quadrangle, 7° 19' W.; through center of quadrangle, 7° 07' W.; for east part of north border of quadrangle, 7° 20' W.

## REHOBOTH QUADRANGLE.

East along highways through center of quadrangle.

| Station.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Latitude.   | Longitude.  | Distance between stations. |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|----------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | " ' "       | " ' "       | <i>Feet.</i>               |
| T road south; W. Burton's mail box at.....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 38 36 12.4  | 75 13 51.7  | .....                      |
| Road forks at road southeast, center of triangle of roads, elevation "21" marked on telephone pole.....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 38 36 20.4  | 75 13 22.4  | 2,460                      |
| T road southeast.....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 38 36 24.8  | 75 12 41.9  | 3,237                      |
| Harmon schoolhouse, crossroads at, 42 feet west of tree marked "21".....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 38 36 52.2  | 75 12 09.6  | 3,773                      |
| Steele's store (old Trinity post office), T lane east at.....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 38 37 23.7  | 75 11 16.5  | 5,285                      |
| Wines crossroads, in center of triangle; iron post stamped "Prim. Trav. Sta. No. 8, 1917".....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 38 37 56.9  | 75 10 55.5  | 3,755                      |
| Road forks, center of timbered triangle formed by roads.....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 38 37 42.3  | 75 09 39.0  | 6,236                      |
| Road forks, 0.5 mile southeast of Wilson's store; Tingle's mail box.....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 38 37 20.0  | 75 08 13.3  | 7,165                      |
| Road south.....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 38 37 27.6  | 75 07 11.1  | 4,992                      |
| Massey triangulation station. Station is on the north side of a wooded ridge on Indian River Neck, on land owned by C. E. Massey, and southwest from the old farmhouse of Peter J. Massey. It may be reached from Rehoboth or Ocean View by water or from the railroad by land. Station mark is a copper triangulation station mark set in cement 3 feet below the surface, and above it is a concrete block, in which is set a 1-inch galvanized-iron pipe 18 inches long, in which is fastened a copper triangulation mark. Reference marks: (1) is cement post with bottle to mark center, 11.335 meters; (2) is cement post with circle and nail to mark center, 13.930 meters..... | 38 37 30.30 | 75 06 12.77 | 4,634                      |

## REHOBOTH QUADRANGLE—Continued.

East along highways near south border of quadrangle.

| Station.                                                                                                                                           | Latitude.   | Longitude.  | Distance between stations. |
|----------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|----------------------------|
| Frankford, southwest corner of First National Bank building, just above sidewalk; aluminum tablet stamped "Prim. Trav. Sta. No. 7, 1910, 37, 1908" | 38 31 03.70 | 75 14 07.40 | Feet.                      |
| Frankford, at east town limits, road forks, just north of school-house.                                                                            | 38 31 14.9  | 75 13 39.4  | 2,493                      |
| Road forks.                                                                                                                                        | 38 31 33.0  | 75 12 59.1  | 3,693                      |
| Omar, northeast corner of Methodist Episcopal Church; iron post stamped "Prim. Trav. Sta. No. 7, 1917"                                             | 38 31 39.6  | 75 12 01.6  | 4,613                      |
| Road forks at road east.                                                                                                                           | 38 31 57.9  | 75 11 28.2  | 3,236                      |
| Crossroads at mail box, painted "61"                                                                                                               | 38 32 03.5  | 75 10 40.7  | 3,810                      |
| Blackwater Creek, culvert crossing; center of road over.                                                                                           | 38 32 08.8  | 75 09 55.7  | 3,610                      |
| Crossroads, center of, at Layton's mail box, No. 10.                                                                                               | 38 32 15.2  | 75 08 59.4  | 4,521                      |
| T road north.                                                                                                                                      | 38 32 22.4  | 75 07 52.2  | 5,388                      |
| Road forks at blacksmith shop.                                                                                                                     | 38 32 25.7  | 75 07 04.9  | 3,766                      |
| Millville, Dukes & Holloway's store; T road south.                                                                                                 | 38 32 51.2  | 75 06 47.4  | 2,933                      |
| Road forks.                                                                                                                                        | 38 32 33.0  | 75 06 05.7  | 3,780                      |
| Bethel Church, at Ocean View; C. & G. S. triangulation station.                                                                                    | 38 32 37.97 | 75 05 30.65 | 2,827                      |

Magnetic declination near south border of quadrangle, 6.7° W.

## MILLSBORO QUADRANGLE.

From Millsboro along highways to east border of quadrangle.

| Station.                                                                                                                                                              | Latitude.  | Longitude. | Distance between stations. |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------------|----------------------------|
| Millsboro Trust & Safe Deposit Co's brick building, in front face, on right of door, 1 foot above ground; aluminum tablet stamped "Prim. Trav. Sta. No. 11, 1910, 27" | 38 35 25.6 | 75 17 32.0 | Feet.                      |
| Millsboro; center of bridge over Indian River.                                                                                                                        | 38 35 41.0 | 75 17 28.9 | 1,577                      |
| Road forks, at Richmond Stone Company's sign board.                                                                                                                   | 38 36 03.7 | 75 16 56.1 | 3,472                      |
| Road forks, 40 feet northwest of fence post, painted "X 25"                                                                                                           | 38 36 05.1 | 75 16 16.2 | 3,168                      |

Magnetic declination for east border of quadrangle, 7° W.

## MARYLAND.

## PRIMARY TRAVERSE AND PRIMARY LEVELING.

Gunpowder quadrangle.

HARFORD COUNTY.

Positions are based on latitudes and longitudes of Piney Point (2), Lego Point (2), and Maxwell Point (2), triangulation stations of the U. S. Coast and Geodetic Survey, North American Datum. The primary traverse was done by C. F. Urquhart in 1917-18.

Elevations are based on heights of Baltimore & Ohio Railroad bench marks Nos. 58A and 63A, near Van Bibber.

Primary leveling was done by H. S. Senseney in 1918. Each permanent station mark and bench mark is a bronze tablet set in a cement post 6 inches square on top and 4 feet long embedded 3½ feet in the ground.

For additional geographic positions in Maryland, see U. S. Geological Survey Bulletins 122, 181, 201, 245, 276, 440, 496, 644-K, and Part I of the 20th and 21st Annual Reports.

The U. S. Coast and Geodetic Survey has many unpublished data.

## GUNPOWDER QUADRANGLE—Continued.

Along Baltimore &amp; Ohio Railroad.

| Station.                                                                                                                                                 | Latitude. | Longitude. | Distance between stations. |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|------------|----------------------------|
| Van Bibber, 0.5 mile west of, in east end of south coping of east abutment of bridge 19A; copper bolt (B. & O. R. R. b. m. 63A). Elevation, 40.418 feet. | " "       | " "        | Feet.                      |
| McComas, opposite signboard, westbound track; top of north rail. Elevation, 61.1 feet.                                                                   |           |            |                            |
| Clayton, opposite station, side track; top of south rail. Elevation, 95.3 feet.                                                                          |           |            |                            |
| Jopps, opposite station, westbound track; top of north rail. Elevation, 86.7 feet.                                                                       |           |            |                            |
| Bradshaw, opposite station, westbound track; top of north rail. Elevation, 41.0 feet.                                                                    |           |            |                            |
| Big Gunpowder bridge, in east end of south coping; copper bolt (B. & O. R. R. b. m. 38A). Elevation, 63.900 feet.                                        |           |            |                            |

Along highways from Van Bibber to Edgewood, thence along Pennsylvania Railroad to Magnolia, thence north to Baltimore & Ohio Railroad, thence northeast along same to point of beginning.

|                                                                                                                                                                                                                                                    |             |             |         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|---------|
| Edgewood, about 1 mile north of, 40 feet south of T road west, east side of road, in root of stump; copper nail and washer (not marked). Elevation, 87.49 feet.                                                                                    |             |             |         |
| Milepost 75, 390 feet south of, east coping of box culvert; copper bolt (P. R. R. b. m. 72). Elevation, 20.80 feet; adjusted elevation, 20.899 feet.                                                                                               |             |             |         |
| Milepost 76, 75 feet north of, southwest coping of box culvert; copper bolt (P. R. R. b. m. 73). Elevation, 36.900 feet.                                                                                                                           |             |             |         |
| Edgewood, 1.4 miles southwest of, at midway post, 75 feet south of guardhouse, 35 feet east of second-class road, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 56, 1918, 41." Elevation, 41.068 feet. (Distance from station 57.) | 39 24 22.07 | 76 18 53.00 | 1,418.3 |
| Magnolia, 210 feet southeast of railroad crossing, 60 feet southwest of road, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 2, 1918, 20." Elevation, 20.086 feet.                                                                  | 39 24 04.69 | 76 19 34.19 | 1,478.5 |
| Magnolia, 1.2 miles north of, at southeast corner of crossroads, in root of tree; copper nail and washer (not marked). Elevation, 100.83 feet.                                                                                                     |             |             |         |
| Magnolia, 1.8 miles north of, west side of road, at road forks, 12 feet north of gate, in root of tree; copper nail and washer (not marked). Elevation, 115.00 feet.                                                                               |             |             |         |
| Clayton, opposite station; top of south rail. Elevation, 95.3 feet.                                                                                                                                                                                |             |             |         |

Along highways from Edgewood to Rickett Point (double-run lines between bench mark 9 and Rickett Point).

|                                                                                                                                                                                                                                                                      |             |             |         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|---------|
| Edgewood, 230 feet southeast of railroad crossing, on the reservation line, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 25, 1918, 33." Elevation, 37.720 feet. (Distance from station 23.)                                                         | 39 24 54.51 | 76 17 36.08 | 2,095.1 |
| Edgewood, 0.45 mile south of, 30 feet west of stone road, 20 feet north of second-class road, at edge of woods, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 23, 1918, 34." Elevation, 33.625 feet. (Distance from station 22.)                     | 39 24 34.14 | 76 17 40.90 | 1,625.6 |
| Edgewood, 0.7 mile south of, 80 feet east of stone road, 380 feet south of concrete culvert, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 22, 1918, 35." Elevation, 35.007 feet. (Distance from station 21.)                                        | 39 24 21.70 | 76 17 27.75 | 2,152.9 |
| Edgewood, 1.2 miles south of, 50 feet north by 30 feet east of forks of stone road, 420 feet south of narrow-gage railroad crossing, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 21, 1918, 27." Elevation, 27.497 feet. (Distance from station 9.) | 39 24 00.45 | 76 17 27.15 | 2,520.5 |
| Edgewood, 1.7 miles south of, in southwest corner of Flatiron Corners, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 9, 1918, 25." Elevation, 24.953 feet. (Distance from station 41.)                                                               | 39 23 35.54 | 76 17 26.52 | 1,551.9 |
| Edgewood, 2.1 miles south of, 100 feet west of where road forks to Beach Point, at edge of field, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 10, 1918, 21." Elevation, 21.516 feet. (Distance from station 42.)                                   | 39 23 13.30 | 76 17 22.00 | 1,597.2 |

## GUNPOWDER QUADRANGLE—Continued.

Along highways from Edgewood to Rickett Point (double-run lines between bench mark 9 and Rickett Point)—Continued.

| Station.                                                                                                                                                                                                                                                         | Latitude.   | Longitude.  | Distance between stations. |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|----------------------------|
| Edgewood, 2.5 miles south of, 0.3 miles south of where road forks to Beach Point, 25 feet east of road, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 11, 1918, 21." Elevation, 21,530 feet. (Distance from station 91).....                     | 39 23 00.88 | 76 17 07.71 | Feet.<br>1,892.7           |
| Edgewood, 2.8 miles south of, on top of hill, 0.3 mile north of gate of road leading to Wilson Point, on east edge of road, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 12, 1918, 24." Elevation, 24,327 feet. (Distance from station 11)..... | 39 22 45.46 | 76 17 02.13 | 1,619.9                    |
| Edgewood, 3.1 miles south of, 8 feet south of gate of road leading to Wilson Point, east side of road, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 13, 1918, 20." Elevation, 19,887 feet. (Distance from station 12).....                      | 39 22 30.94 | 76 17 07.48 | 1,527.5                    |
| Edgewood, 3.4 miles south of, about 0.25 mile west of Dove's Cove, 60 feet west of road, 30 feet east of house, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 14, 1918, 27." Elevation, 27,354 feet. (Distance from station 13).....             | 39 22 18.26 | 76 17 19.75 | 1,604.4                    |
| Edgewood, 3.8 miles south of, 300 feet southeast of yellow house, 50 feet west of road, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 15, 1918, 24." Elevation, 23,997 feet. (Distance from station 14).....                                     | 39 21 59.96 | 76 17 26.48 | 1,925.5                    |
| Edgewood, 4.2 miles south of, 40 feet west of road, 50 feet north of Maxwell Gate, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 16, 1918, 16." Elevation, 15,604 feet. (Distance from station 15).....                                          | 39 21 42.23 | 76 17 24.12 | 1,803.7                    |
| Maxwell Gate, 0.3 mile south of, 50 feet west of road, 50 feet south of old private road, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 126, 1918, 18." Elevation, 17,736 feet. (Distance from station 76).....                                  | 39 21 25.17 | 76 17 17.54 | 1,758.6                    |
| Maxwell Gate, 0.7 mile south of, 140 feet west of road, 15 feet north of rail fence, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 76, 1918, 31." Elevation, 30,846 feet. (Distance from station 78).....                                        | 39 21 09.99 | 76 17 06.63 | 1,637.9                    |
| Maxwell Gate, 1 mile south of, 140 feet west of road, 30 feet east of old house, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 77, 1918, 23." Elevation, 22,688 feet. (Distance from station 76).....                                            | 39 20 57.88 | 76 16 51.49 | 1,707.2                    |
| Maxwell Gate, 1.4 miles south of, 240 feet south of road to Bell Farm, 30 feet east of road, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 75, 1918, 23." Elevation, 22,721 feet. (Distance from station 77).....                                | 39 20 48.97 | 76 16 31.84 | 1,786.7                    |
| Maxwell Gate, 1.7 miles south of, 20 feet east of road forks to Lego Point, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 93, 1918, 11." Elevation, 11,357 feet. (Distance from station 75).....                                                 | 39 20 33.84 | 76 16 28.52 | 1,553.3                    |
| Maxwell Gate, 2.0 miles south of, 300 feet southwest of lane northwest to house, 20 feet northwest of road, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 94, 1918, 5." Elevation, 4,688 feet. (Distance from station 93).....                   | 39 20 22.24 | 76 16 41.02 | 1,530.8                    |
| Maxwell Gate, 2.4 miles south of, 70 feet west of road, 140 feet northwest of old log house, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 95, 1918, 15." Elevation, 15,011 feet. (Distance from station 94).....                                | 39 20 07.48 | 76 16 50.72 | 1,676                      |
| Maxwell Gate, 2.7 miles south of, 20 feet west of road where road makes sharp turn to west, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 96, 1918, 12." Elevation, 12,055 feet. (Distance from station 95).....                                 | 39 19 52.96 | 76 16 51.38 | 1,470.3                    |
| Maxwell Gate, 3 miles south of, 600 feet north of G. W. Beal's old residence, 280 feet north of bend in road, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 97, 1918, 20." Elevation, 19,948 feet. (Distance from station 96).....               | 39 19 52.79 | 76 17 09.97 | 1,460.9                    |
| Maxwell Gate, 3.2 miles south of, 320 feet south of 7 lane west, 10 feet east of road, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 99, 1918, 24." Elevation, 23,638. (Distance from station 97).....                                           | 39 19 38.71 | 76 17 04.50 | 1,487.4                    |
| Maxwell Gate, 3.5 miles south of, 45 feet south of road forks, in line with road north, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 100, 1918, 14." Elevation, 13,825 feet. (Distance from station 99).....                                    | 39 19 23.15 | 76 16 54.52 | 1,758.9                    |
| Maxwell Gate, 3.9 miles south of, 170 feet southeast of bend in road, 25 feet southwest of rail fence, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 101, 1918, 31." Elevation, 31,165 feet. (Distance from station 100).....                    | 39 19 08.50 | 76 17 01.85 | 1,590.1                    |
| Maxwell Gate, 4.4 miles south of, 18 feet west of road, about 0.25 mile south of marsh, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 102, 1918, 5." Elevation, 5,497 feet. (Distance from station 101).....                                     | 39 18 51.30 | 76 17 09.75 | 1,847.4                    |

## GUNPOWDER QUADRANGLE—Continued.

Along highways from Edgewood to Rickett Point (double-run lines between bench mark 9 and Rickett Point)—Continued.

| Station.                                                                                                                                                                                                                                                                                                 | Latitude.   | Longitude.  | Distance between stations. |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|----------------------------|
| Maxwell Gate, 4.8 miles south of, 30 feet south of gate across road, 12 feet west of road, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 103, 1918, 7." Elevation, 7,187 feet. (Distance from station 102).....                                                                          | 39 18 30.24 | 76 17 22.61 | Feet.<br>2,358.6           |
| Maxwell Gate, 5.2 miles south of, about 0.5 mile northeast of Rickett Point, about 700 feet east of house, 240 feet northeast of rail fence, 3 feet east of road, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 104, 1918, 14." Elevation, 13,993 feet. (Distance from station 103)..... | 39 18 12.83 | 76 17 33.40 | 1,955.2                    |
| Rickett Point, about 0.5 mile east of, on beach 20 feet north of high water, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 105, 1918, 5." Elevation, 5,258 feet. (Distance from station 106).....                                                                                        | 39 18 00.32 | 76 17 23.72 | 2,032.6                    |

Along highways from bench mark 9 via bench marks 38, 36, 33, etc., to bench mark 56.

|                                                                                                                                                                                                                                                                                      |             |             |         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|---------|
| Flatiron Corners, 0.3 mile southwest of, about 0.3 mile east of barracks, 60 feet north of road, on west side of large oak tree, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 41, 1918, 30." Elevation, 29,702 feet. (Distance from station 40).....                | 39 23 23.02 | 76 17 37.95 | 1,904.6 |
| Edgewood Barracks, 870 feet west of barrack No. 1, north side of road, 150 feet southeast of two water towers, on west side of big locust tree, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 38, 1918, 34." Elevation, 33,602 feet. (Distance from station 39)..... | 39 23 15.79 | 76 18 22.91 | 1,408.0 |
| Canal Creek, 0.25 mile east of mouth of, 50 feet north of beach, 6 feet south of road, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 37, 1918, 13." Elevation, 12,986 feet. (Distance from station 38).....                                                          | 39 23 13.72 | 76 18 43.38 | 1,634.4 |
| Canal Creek, 0.15 mile west of mouth of, 0.25 miles southeast of San Domingo Club, 100 feet south of road, 60 feet north of beach, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 36, 1918, 19." Elevation, 19,028 feet. (Distance from station 37).....              | 39 23 21.47 | 76 19 11.63 | 2,235.6 |
| San Domingo Club, 420 feet northwest of, 50 feet northeast of lone pear tree, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 35, 1918, 38." Elevation, 38,423 feet. (Distance from station 34).....                                                                   | 39 23 35.77 | 76 19 24.84 | 1,803.0 |
| Magnolia, about 0.4 mile southeast of, about 0.4 mile north of San Domingo Club, 320 feet east of road, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 33, 1918, 37." Elevation, 36,614 feet. (Distance from station 3).....                                          | 39 23 51.87 | 76 19 13.51 | 1,542.0 |
| Magnolia, about 0.2 mile east of, 25 feet east of road south to San Domingo Club, north side of road, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 3, 1918, 36." Elevation, 36,143 feet. (Distance from station 4).....                                             | 39 24 07.02 | 76 19 15.59 | 1,595.4 |
| Magnolia, about 0.5 mile east of, 200 feet southeast of farmhouse, north side of road, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 4, 1918, 41." Elevation, 41,065 feet. (Distance from station 5).....                                                            | 39 24 10.84 | 76 18 55.86 | 1,700.4 |

From bench mark 100 via bench marks 113, 114, and 98 to bench mark 97.

|                                                                                                                                                                                                                                              |             |             |         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|---------|
| Days Point, 0.8 mile southeast of, 110 feet southeast of house, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 113, 1918, 41." Elevation, 40,634 feet. (Distance from station 101).....                                       | 39 19 18.27 | 76 17 18.79 | 1,658.6 |
| Days Point, 0.4 mile southeast of, about 0.25 mile southwest of house, 60 feet east of beach, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 114, 1918, 8." Elevation, 7,932 feet. (Distance from station 113).....           | 39 19 29.88 | 76 17 37.35 | 1,975.5 |
| Days Point, 0.4 mile east of, 250 feet northeast of house, 20 feet north of northwest corner of corner, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 98, 1918, 26." Elevation, 26,322 feet. (Distance from station 97)..... | 39 19 44.28 | 76 17 29.65 | 1,770.4 |

## GUNPOWDER QUADRANGLE--Continued.

From bench mark 94 to bench mark 127 (checked spur).

| Station.                                                                                                                                                                                                              | Latitude.         | Longitude.        | Distance between stations. |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------------------|----------------------------|
| Watson Creek, 0.7 mile southeast of mouth of, about 0.4 mile northwest of house, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 127, 1918, 9." Elevation, 8,564 feet. (Distance from station 94.)..... | ° ' " 39 20 32.35 | ° ' " 76 17 04.63 | Feet. 2,118.2              |

From bench mark 76 via bench marks 83 and 82 to bench mark 77.

|                                                                                                                                                                                                                         |                   |                   |         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------------------|---------|
| Old Pell residence, 0.85 mile northwest of, about 0.25 mile west of Cooper Creek, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 83, 1918, 25." Elevation, 25,087 feet. (Distance from station 76.)..... | ° ' " 39 21 26.12 | ° ' " 76 16 55.52 | 1,850.9 |
| Old Pell residence, 0.50 mile northwest of, 0.2 mile west of Cooper Creek, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 82, 1918, 29." Elevation, 28,681 feet. (Distance from station 83.).....        | ° ' " 39 21 07.76 | ° ' " 76 16 39.90 | 2,226.1 |

From bench mark 97 via bench mark 118 to bench mark 98.

|                                                                                                                                                                                                                            |                   |                   |         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------------------|---------|
| Days Point, 0.6 mile northeast of, about 0.3 mile north of house, at edge of woods, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 118, 1918, 24." Elevation, 24,085 feet. (Distance from station 97.)..... | ° ' " 39 20 04.14 | ° ' " 76 17 24.92 | 1,642.5 |
| Days Point, 0.8 mile northeast of, on east side of old unused road through woods, in concrete post; bronze tablet stamped                                                                                                  |                   |                   |         |

## GUNPOWDER QUADRANGLE—Continued.

From bench mark 21 via bench marks 44, 46, etc., to bench mark 48 (checked spur).

| Station.                                                                                                                                                                                                                                                                    | Latitude.   | Longitude.  | Distance between stations. |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|----------------------------|
| Edgewood, about 1.1 miles south of, about 0.3 mile east of stone road, 20 feet north of road to docks, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 44, 1918, 25." Elevation, 25.414 feet. (Distance from station 22).....                                 | 39 24 09.54 | 76 17 05.45 | 2,139.5                    |
| Edgewood, about 1.3 miles southeast of, about 1 mile northwest of docks, 50 feet north of road, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 45, 1918, 13." Elevation, 13.250 feet. (Distance from station 44).....                                        | 39 24 04.48 | 76 16 42.02 | 1,903.0                    |
| Bush River Docks, about 0.4 mile northwest of, 130 feet east of road crossing, in road, 3 feet south of ditch, 6 inches below surface, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 46, 1918, 20." Elevation, 19.683 feet. (Distance from station 45)..... | 39 23 51.55 | 76 16 29.10 | 1,655.3                    |
| Bush River Docks, 0.1 mile west of, 70 feet east of house, on hill, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 47, 1918, 26." Elevation, 25.658 feet. (Distance from station 46).....                                                                    | 39 23 44.55 | 76 16 12.42 | 1,489.0                    |
| Kings Creek, 0.25 mile northeast of mouth of, 25 feet north by 25 feet west of end of telephone line, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 48, 1918, 7." Elevation, 7.047 feet. (Distance from station 50).....                                    | 39 23 32.95 | 76 15 56.12 | 2,063.1                    |

From bench mark 15 to bench mark 84.

|                                                                                                                                                                                                                                                  |             |             |         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|---------|
| Edgewood, about 3.8 miles south of, about 0.25 miles southwest of yellow house, on main road at Doves Cove, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 84, 1918, 20." Elevation, 19.742 feet. (Distance from station 15)..... | 39 21 57.36 | 76 17 44.67 | 1,452.7 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|---------|

From bench mark 14 via bench marks 87, 86, and 92 to bench mark 38.

|                                                                                                                                                                                                                                                                     |             |             |         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|---------|
| Wright Creek, 0.4 mile southeast of mouth of, about 0.5 mile west of Doves Cove, on south side of old road through woods, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 87, 1918, 20." Elevation, 20.257 feet. (Distance from station 14).....      | 39 22 18.06 | 76 17 41.19 | 1,634.1 |
| Swaderick Creek, 0.6 mile northeast of mouth of, about 1,200 feet south of old unused road, 150 feet south of field, in woods, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 85, 1918, 18." Elevation, 16.069 feet. (Distance from station 84)..... | 39 22 05.49 | 76 17 57.91 | 1,325.3 |
| Swaderick Creek, 0.3 mile north of mouth of, 20 feet east of beach, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 86, 1918, 5." Elevation, 4.771 feet. (Distance from station 85).....                                                              | 39 21 55.38 | 76 18 20.03 | 2,015.2 |
| Wright Creek, 0.14 mile south of mouth of, 60 feet east of beach, on south side of old road through woods, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 88, 1918, 9." Elevation, 8.924 feet. (Distance from station 86).....                       | 39 22 21.84 | 76 18 06.70 | 2,874.2 |
| Wright Creek, 0.35 mile north of mouth of, 25 feet east of beach, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 92, 1918, 11." Elevation, 11.178 feet. (Distance from station 88).....                                                              | 39 22 40.13 | 76 18 11.43 | 2,486.7 |
| Edgewood Barracks, about 0.3 mile south of water towers, 60 feet west of road, 30 feet east of beach, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 39, 1918, 16." Elevation, 16.419 feet. (Distance from station 92).....                          | 39 23 02.10 | 76 18 19.72 | 1,742.0 |

From bench mark 23 via bench mark 24 to bench mark 6.

|                                                                                                                                                                                                                                     |             |             |         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|---------|
| Edgewood, about 0.8 mile southwest of, about 0.4 mile southwest of stone road, at top of hill, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 24, 1918, 39." Elevation, 38.857 feet. (Distance from station 23)..... | 39 24 22.57 | 76 18 02.15 | 2,038.6 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|---------|

## GUNPOWDER QUADRANGLE—Continued.

From bench mark 10 via bench mark 51 to Beach Point.

| Station.                                                                                                                                                                                                                                | Latitude.   | Longitude.  | Distance between stations. |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|----------------------------|
| Beach Point, 0.7 mile southwest of, 8 feet south of road to Philadelphia Club, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 52, 1918, 23." Elevation, 23.188 feet. (Distance from station 10).....                     | 39 23 09.82 | 76 16 54.34 | 2,200.3                    |
| Beach Point, 0.45 mile southwest of, 600 feet west of Philadelphia Club, 30 feet south of road, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 51, 1918, 14." Elevation, 14.030 feet. (Distance from station 52).....    | 39 23 10.16 | 76 16 33.70 | 1,621.0                    |
| Beach Point, 670 feet southwest of, 45 feet southeast of Kings Creek, 65 feet north of old road, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 50, 1918, 10." Elevation, 10.483 feet. (Distance from station 51).....   | 39 23 16.26 | 76 16 11.23 | 1,809.1                    |
| Beach Point, 0.5 mile southwest of, about 0.4 mile northwest of Wilson Point, 50 feet west of beach, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 53, 1918, 8." Elevation, 8.455 feet. (Distance from station 51)..... | 39 22 52.19 | 76 16 32.50 | 1,820.9                    |

From bench mark 10 to bench mark 49 (checked spur).

|                                                                                                                                                                                                                        |             |             |         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|---------|
| Beach Point, 0.4 mile northwest of, 25 feet west of beach, at end of old wood road, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 49, 1918, 7." Elevation, 7.227 feet. (Distance from station 50)..... | 39 23 28.59 | 76 16 33.92 | 2,174.6 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|---------|

From bench mark 93 to Lego Point.

|                                                                                                                                                                                                                                            |             |             |         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|---------|
| Lego Point, about 1 mile northwest of, 15 feet north of road, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 119, 1918, 5." Elevation, 4.722 feet. (Distance from station 93).....                                          | 39 20 22.71 | 76 16 14.68 | 1,605.8 |
| Lego Point, about 0.7 mile west of, 65 feet west of house, 3 feet north of road, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 120, 1918, 8." Elevation, 7.782 feet. (Distance from station 119).....                      | 39 20 10.23 | 76 15 57.92 | 1,823.4 |
| Lego Point, about 0.4 mile west of, about 600 feet south of observation tower, 12 feet south of road, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 121, 1918, 5." Elevation, 5.072 feet. (Distance from station 120)..... | 39 20 15.30 | 76 15 35.98 | 1,798.4 |

From bench mark 75 via Briery and Sandy points and bench mark 122 to point of beginning.

|                                                                                                                                                                                                                                                        |             |             |         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|---------|
| Edgewood, 5.6 miles south of, at southwest corner of old Bell farmhouse, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 74, 1918, 27." Elevation, 26.783 feet. (Distance from station 75).....                                          | 39 21 00.21 | 76 16 07.87 | 2,201.4 |
| Old Bell farm, about 0.3 mile north of, about 800 feet north of Sunshine Club, 180 feet west of beach, on hill, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 73, 1918, 22." Elevation, 22.262 feet. (Distance from station 74).....   | 39 21 14.78 | 76 16 02.89 | 1,525.2 |
| Briery Point, 80 feet west of, on beach, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 72, 1918, 5." Elevation, 5.409 feet. (Distance from station 73).....                                                                            | 39 21 32.61 | 76 15 58.13 | 1,843.9 |
| Sandy Point, 1,150 feet west of, 90 feet southwest of beach, 810 feet southeast of rail fence, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 123, 1918, 8." Elevation, 8.391 feet. (Distance from station 74).....                     | 39 20 51.22 | 76 15 40.91 | 2,304.4 |
| Sandy Point, about 0.5 mile southwest of, about 0.4 mile south of the old Bell house, 30 feet east of rail fence, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 122, 1918, 8." Elevation, 7.816 feet. (Distance from station 123)..... | 39 20 43.13 | 76 15 59.42 | 1,668.4 |

From bench mark 103 to Robins Point.

|                                                                                                                                                                                                                          |             |             |         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|---------|
| Robins Point, 0.4 mile northwest of, north side of old unused road through woods, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 106, 1918, 12." Elevation, 12.423 feet. (Distance from station 105)..... | 39 18 16.96 | 76 17 09.05 | 2,032.6 |
| Robins Point, 925 feet north of, 15 feet from beach where old unused road ends, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 107, 1918, 4." Elevation, 3.904 feet. (Distance from station 106).....     | 39 18 07.97 | 76 16 54.23 | 1,472.7 |

## GUNPOWDER QUADRANGLE—Continued.

From bench mark 102 to bench mark 108 (checked spur).

| Station.                                                                                                                                                                                                                                             | Latitude.   | Longitude.  | Distance between stations. |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|----------------------------|
| Robins Point, about 0.7 mile north of, about 0.3 mile southwest of Ford Point, on hill 60 feet west of beach, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 108, 1918, 14." Elevation, 14.008 feet. (Distance from station 102)..... | 39 18 36.68 | 76 16 53.39 | Feet.<br>1,960.0           |

From bench mark 100 via bench marks 113 and 111 to point of beginning.

|                                                                                                                                                                                                                         |             |             |         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|---------|
| Boone Creek, 0.75 mile southwest of mouth of, 1,220 feet north of house, in woods, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 112, 1918, 5." Elevation, 5.192 feet. (Distance from station 100)..... | 39 19 39.00 | 76 16 46.52 | 1,723.1 |
| Boone Creek, 0.45 mile southwest of mouth of, 30 feet west of beach, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 111, 1918, 4." Elevation, 4.080 feet. (Distance from station 112).....               | 39 19 34.82 | 76 16 17.76 | 2,299.1 |

From bench mark 100 to bench mark 110 (checked spur).

|                                                                                                                                                                                            |             |             |         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|---------|
| Ford Point, 0.5 mile north of, 10 feet west of beach, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 110, 1918, 7." Elevation, 7.488 feet. (Distance from station 109)..... | 39 19 16.64 | 76 16 39.49 | 2,012.3 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|---------|

From bench mark 101 to bench mark 109 (checked spur).

|                                                                                                                                                                                                         |             |             |         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|---------|
| Ford Point, 0.22 mile northwest of, on high ground between marshes, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 109, 1918, 9." Elevation, 5.634 feet (distance from station 101)..... | 39 18 58.29 | 76 16 49.37 | 1,424.3 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|---------|

From bench mark 95 to bench mark 125 (checked spur).

|                                                                                                                                                                                                                                |             |             |         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|---------|
| Boone Creek, 0.5 mile west of mouth of, 0.3 mile southeast of old log house, on main road, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 125, 1918, 7." Elevation, 7.008 feet. (Distance from station 95)..... | 39 19 50.45 | 76 16 31.52 | 1,713.3 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|---------|

From bench mark 9 via bench marks 8, 7, 6, and 5 to bench mark 53.

|                                                                                                                                                                                                                                                                                                 |             |             |         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|---------|
| Flatiron Corners, 0.35 mile northwest of, in angle made by the old Magnolia road and new cut road, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 8, 1918, 9." Elevation, 9.220 feet. (Distance from station 9).....                                                             | 39 23 50.35 | 76 17 39.61 | 1,817.2 |
| Flatiron Corners, 0.7 mile northwest of, south side of road, 200 feet west of railroad crossing, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 7, 1918, 36." Elevation, 35.738 feet. (Distance from station 8).....                                                             | 39 24 00.77 | 76 17 59.42 | 1,878.8 |
| Flatiron Corners, 0.8 mile northwest of, 10 feet south of road, 240 feet east of railroad crossing, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 6, 1918, 23." Elevation, 22.666 feet. (Distance from station 7).....                                                          | 39 24 06.73 | 76 18 16.11 | 1,441.6 |
| Flatiron Corners, 1.3 miles northwest of, about 0.8 mile east of Magnolia, 350 feet west of old red brick schoolhouse, 10 feet north of road, at road forks, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 5, 1918, 11." Elevation, 11.082 feet. (Distance from station 6)..... | 39 24 14.07 | 76 18 34.53 | 1,625.8 |

## GUNPOWDER QUADRANGLE—Continued.

From Pennsylvania R. R. bench mark 72 via bench marks 28, 61, and 63 to point of beginning.

| Station.                                                                                                                                                                                                                                                               | Latitude.   | Longitude.  | Distance between stations. |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|----------------------------|
| Edgewood, 0.25 mile northeast of, 30 feet south of south rail, 2 feet north of right of way line, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 26, 1918, 32". Elevation, 31,809 feet. (Distance from station 25).....                                 | 39 25 03.11 | 76 17 20.25 | 1,518.7                    |
| Edgewood, 0.5 mile northeast of, 30 feet south of south rail, 1 foot south of right of way line, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 60, 1918, 26". Elevation, 25,683 feet. (Distance from station 26).....                                  | 39 25 10.42 | 76 17 02.81 | 1,556.2                    |
| Edgewood, 0.8 mile northeast of, 150 feet south of right of way line, at west edge of woods, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 61, 1918, 20". Elevation, 20,476 feet. (Distance from station 60).....                                      | 39 25 16.37 | 76 16 44.19 | 1,580.4                    |
| Edgewood, 0.8 mile east of, about 0.4 miles southeast of railroad, 80 feet north of Launderick Creek, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 62, 1918, 6". Elevation, 5,682 feet. (Distance from station 61).....                               | 39 24 57.08 | 76 16 42.17 | 1,937.9                    |
| Edgewood, 0.5 mile east of, west side of old road to Launderick Creek, 25 feet east of rail fence, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 63, 1918, 21". Elevation, 21,460 feet. (Distance from station 62).....                                | 39 24 52.31 | 76 17 00.97 | 1,531.3                    |
| Edgewood, 0.8 miles southeast of, about 0.1 mile north of point made by the upper forks of Launderick Creek, west side of old road, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 64, 1918, 9". Elevation, 9,038 feet. (Distance from station 63)..... | 39 24 38.65 | 76 16 47.25 | 1,750.3                    |

From bench mark 13 via bench marks 69, 55, and 54 to point of beginning.

|                                                                                                                                                                                                                                             |             |             |         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|---------|
| Wilson Point, 0.6 miles southwest of, on point on north side of Dove's Cove, 70 feet west of shore line, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 69, 1918, 4". Elevation, 4,232 feet. (Distance from station 14)..... | 39 22 15.79 | 76 16 54.68 | 1,984.0 |
| Wilson Point, 0.4 mile west of, 100 feet south of lane, 460 feet east of house, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 55, 1918, 31". Elevation, 31,268 feet. (Distance from station 69).....                        | 39 22 33.39 | 76 16 45.25 | 1,927.5 |
| Wilson Point, 80 feet west of, 0.5 mile east of house on hill, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 54, 1918, 11". Elevation, 10,979 feet. (Distance from station 55).....                                         | 39 22 36.86 | 76 16 20.15 | 2,001.7 |

From bench mark 15 to bench mark 71 (checked spur).

|                                                                                                                                                                                                                                  |             |             |         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|---------|
| Cooper Creek, 0.4 mile west of mouth of, 500 feet southwest of house, at east side of gate, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 70, 1918, 26". Elevation, 26,190 feet. (Distance from station 15)..... | 39 21 50.22 | 76 16 49.07 | 3,099.2 |
| Cooper Creek, 600 feet west of mouth, 30 feet west of beach, 40 feet south of house, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 71, 1918, 12". Elevation, 11,665 feet. (Distance from station 70).....        | 39 21 46.37 | 76 16 29.18 | 1,609.9 |

From bench mark 9 to bench mark 43 (checked spur).

|                                                                                                                                                                                                                                                |             |             |         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|---------|
| Flatiron Corners, 0.3 mile east of, 55 feet north of road, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 42, 1918, 11". Elevation, 19,822 feet. (Distance from station 9).....                                                 | 39 23 39.37 | 76 17 06.78 | 1,597.2 |
| Flatiron Corners, 0.6 mile east of, at end of road to Kings Creek, 60 feet east of two-story frame house, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 43, 1918, 14". Elevation, 14,056 feet. (Distance from station 42)..... | 39 23 38.15 | 76 16 47.76 | 1,498.5 |

From bench mark 8 to bench mark 30 (checked spur).

|                                                                                                                                                                                                                                      |             |             |       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|-------|
| Flatiron Corners, 0.3 mile west of, 750 feet southwest of road to Magnolia, on west edge of marsh, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 30, 1918, 9". Elevation, 9,099 feet. (Distance from station 8)..... | 39 23 44.16 | 76 17 45.62 | 784.0 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|-------|

## GUNPOWDER QUADRANGLE—Continued.

From bench mark 33 via bench marks 31 and 29 to bench mark 8.

| Station.                                                                                                                                                                                                                                                          | Latitude.   | Longitude.  | Distance between stations. |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|----------------------------|
| Canal Creek, 0.3 mile north of mouth of, about 0.3 mile north-east of San Domingo Club, in woods, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 34, 1918, 18." Elevation, 17,556 feet. (Distance from station 33).....                            | 39 23 37.95 | 76 19 02.05 | 1,670.8                    |
| Magnolia, about 0.65 miles southeast of, about 0.45 miles south of road to Flatiron Corners, 105 feet south of big oak tree, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 32, 1918, 36." Elevation, 35,518 feet. (Distance from station 33)..... | 39 23 47.42 | 76 18 58.75 | 1,243.1                    |
| Magnolia, about 0.8 miles southeast of, about 0.2 mile southeast of the Cell Building, 100 feet north of marsh, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 31, 1918, 8." Elevation, 7,800 feet. (Distance from station 32).....                | 39 23 52.64 | 76 18 38.28 | 1,691.6                    |
| Magnolia, about 1.0 mile southeast of, about 0.25 mile west of large gas tank, 90 feet east of marsh, on top of hill, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 28, 1918, 13." Elevation, 13,440 feet. (Distance from station 31).....        | 39 23 42.44 | 76 18 35.49 | 1,055.0                    |
| Magnolia, about 1.5 miles southeast of, 300 feet south of filling plant, 6 feet north of heavy wire fence, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 29, 1918, 11." Elevation, 11,337 feet. (Distance from station 30).....                   | 39 23 34.49 | 76 18 03.76 | 1,726.8                    |

From bench mark 45 via bench mark 68 to bench mark 47.

|                                                                                                                                                                                                                         |             |             |         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|---------|
| Landerick Creek, 0.5 mile northwest of mouth of, 60 feet south of creek, on bluff, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 67, 1918, 12." Elevation, 12,041 feet. (Distance from station 65)..... | 39 24 22.81 | 76 16 33.55 | 1,217.4 |
| Landerick Creek, on point south of mouth of, 25 feet south of beach, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 68, 1918, 9." Elevation, 9,115 feet. (Distance from station 67).....                 | 39 24 09.92 | 76 16 08.92 | 2,332.2 |

From bench mark 22 to bench mark 65 (checked spur).

|                                                                                                                                                                                                                             |             |             |         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|---------|
| Edgewood, 0.6 mile southeast of where old road to Landerick Creek enters woods, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 66, 1918, 30." Elevation, 30,311 feet. (Distance from station 22).....        | 39 24 32.14 | 76 17 08.97 | 1,813.3 |
| Edgewood, 0.9 mile southeast of, 30 feet west of Landerick Creek, where old road ends, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 65, 1918, 14." Elevation, 13,907 feet. (Distance from station 66)..... | 39 24 27.80 | 76 16 47.66 | 1,730.3 |

From bench mark 41 via bench marks 40, 124, 90, and 91 to bench mark 11.

|                                                                                                                                                                                                                                                  |             |             |         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|---------|
| Edgewood Barracks, 5.6 feet south by 6.6 feet east of, north-west corner of barrack No. 15, under building, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 40, 1918, 27." Elevation, 27,513 feet. (Distance from station 41)..... | 39 23 15.42 | 76 18 00.15 | 1,904.6 |
| Edgewood Barracks, about 0.3 mile south of barrack No. 16, 10 feet south of sharp bend in trail, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 124, 1918, 15." Elevation, 14,633 feet. (Distance from station 39).....           | 39 23 05.61 | 76 17 49.77 | 2,378.0 |
| Edgewood Barracks, about 0.7 mile south of, 120 feet south of old road through woods, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 90, 1918, 16." Elevation, 16,278 feet. (Distance from station 91).....                       | 39 22 50.17 | 76 17 51.04 | 1,700.5 |
| Edgewood Barracks, about 1 mile southeast of, 270 feet south of old road through woods, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 91, 1918, 11." Elevation, 11,171 feet. (Distance from station 11).....                     | 39 22 53.33 | 76 17 29.76 | 1,892.7 |

From bench mark 90 to bench mark 89 (checked spur).

|                                                                                                                                                                                                                     |             |             |         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|---------|
| Wright Creek, about 0.5 mile east of mouth of, 240 feet east of marsh, in woods, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 89, 1918, 5." Elevation, 4,974 feet. (Distance from station 90)..... | 39 22 35.07 | 76 17 51.22 | 1,527.7 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|---------|

## GUNPOWDER QUADRANGLE--Continued.

From bench mark 25 via bench marks 59, 58, and 57 to bench mark 56.

| Station.                                                                                                                                                                                                                    | Latitude.   | Longitude.  | Distance between stations. |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|----------------------------|
| Edgewood, 0.3 mile southwest of, on reservation line, just inside of heavy wire fence, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 59, 1918, 43." Elevation, 43.358 feet. (Distance from station 25)..... | 39 24 46.77 | 76 17 54.45 | 1,641.1                    |
| Edgewood, 0.7 mile southwest of, on reservation line, just inside of heavy wire fence, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 58, 1918, 33." Elevation, 33.323 feet. (Distance from station 59)..... | 39 24 38.86 | 76 18 13.21 | 1,676.4                    |
| Edgewood, 1 mile southwest of, on reservation line, just inside of heavy wire fence, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 57, 1918, 33." Elevation, 32.705 feet. (Distance from station 58).....   | 39 24 28.77 | 76 18 37.13 | 2,137.1                    |

From bench mark 2 to bench mark 1.

|                                                                                                                                                                                                                                        |             |             |         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|---------|
| Magnolia, 0.5 mile southwest of, 900 feet west of road to Piney Point, 55 feet south of south rail, in concrete post; bronze tablet stamped "Prim. Trav. Sta. No. 1, 1918, 30." Elevation, 30.314 feet. (Distance from station 2)..... | 39 23 53.97 | 76 20 03.27 | 2,526.4 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|---------|

Magnetic declination for quadrangle, 7.0° W.

From Piney Point (2) northeast, south, and west along highways to Maxwell Point.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |             |       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|-------|
| Piney Point (2) triangulation station of U. S. Coast and Geodetic Survey, on north side of Gunpowder River, 0.5 mile east of the railroad bridge. A chestnut tree 3 feet in diameter stands 17 feet 7 inches from the signal and close to the edge of the bluff, which is about 10 feet high. The chimney of Litchfield's house bears about N. 0.75° E. and is 142.5 feet distant. Point is marked by two 4-inch drain tiles planted vertically, one above the other, the upper end about 8 inches below the surface of the ground. In this a pine stub was placed, the center of the tile and station being marked on it by a large wire nail..... | 39 23 18.58 | 76 20 00.76 | ..... |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|-------|

## TRIANGULATION STATIONS.

## LEGO POINT (2), HARFORD COUNTY, MD.

On marshy point of same name at southern entrance to Bush River, 24 feet from shore line northeast, and 21 feet from shore line south.

Marked by two 4-inch drain tiles planted vertically, the upper end about 8 inches below the surface of the ground. In this a pine stub was placed, the center of the tile and station being marked on it by a large wire nail.

[Latitude 39° 20' 11.24". Longitude 76° 15' 14.67".]

## MAXWELL POINT (2), HARFORD COUNTY, MD.

On Maxwell Point, east side of Gunpowder River. The land is about 10 feet high at the station and is protected along the shore by a wall and loose blocks of stone. From the station to the wall at the point the distance is 30 feet, on the northwest 30 feet, and on the southwest 20 feet. The point is marked by two 4-inch drain tiles planted vertically one above the other, the upper end about 8 inches below the surface of the ground. In this a pine stub was placed, the center of the tile and station being marked on it by a large wire nail.

[Latitude 39° 21' 25.07". Longitude 76° 19' 22.58".]

## MARYLAND-WEST VIRGINIA.

## TRIANGULATION STATIONS.

Davis, Elk Garden, and Keyser quadrangles.

GARRETT COUNTY, MARYLAND; GRANT, PARSONS, MINERAL, AND TUCKER COUNTIES,  
WEST VIRGINIA:

Triangulation by J. B. Metcalfe, jr., in the spring of 1916, based on Pinnacle-Nat, and checked on Limestone, Shaver, and Backbone. Twelve new stations were occupied, and five old stations were reoccupied, all on North American datum.

For additional positions in West Virginia see U. S. Geological Survey Bulletins 122, 181, 216, 245, 310, 440, 496, 551, 644-R, and Twentieth Annual Report, Part I, also U. S. Coast and Geodetic Survey Special Publication No. 30.

## CONNEWAY, GARRETT COUNTY, MD.

On Backbone Ridge, 0.25 mile east of the Old Northwestern pike crossing, on J. M. Conneway's land, 0.25 mile northwest of his residence. The point was heavily timbered, so the timber was cleared on the south and east slopes. The instrument was elevated 35 feet.

Station mark: Bronze tablet set in large flat rock.

Reference mark: Signal tree, which is under center of instrument.

[Latitude  $39^{\circ} 18' 16.12''$ . Longitude  $79^{\circ} 24' 46.93''$ .]

| To station—   | Azimuth.     | Back azimuth. | Distance.    |        |
|---------------|--------------|---------------|--------------|--------|
|               |              |               | Log. meters. | Miles. |
| Bearden.....  | 2 58 42.67   | 182 58 12.41  | 4.3452079    | 13.758 |
| Pinnacle..... | 253 14 26.01 | 73 27 08.61   | 4.4780913    | 13.683 |
| Keystone..... | 282 16 47.97 | 102 26 01.55  | 4.3314605    | 13.329 |
| Snow.....     | 333 25 38.80 | 153 29 04.63  | 4.2421769    | 10.852 |
| Brown.....    | 347 40 31.79 | 167 42 02.36  | 4.2070180    | 10.008 |
| Schell.....   | 263 46 30.77 | 83 53 01.77   | 4.17237      | 9.242  |

## BACKBONE, TUCKER COUNTY, W. VA.

On south end of Backbone Ridge, about 2 miles north of Hendricks post office. From Hendricks a private road leads to Albert Fansler's house, about 0.5 mile distant, and thence about 1.5 miles to signal, which is on a bare rocky ledge.

Station mark: Bronze tablet cemented in solid ledge.

[Latitude  $39^{\circ} 06' 23.16''$  (L),  $39^{\circ} 06' 23.89''$  (M). Longitude  $79^{\circ} 36' 05.85''$  (L),  $79^{\circ} 36' 07.33''$  (M).]

| To station—        | Azimuth.     | Back azimuth. | Distance.    |        |
|--------------------|--------------|---------------|--------------|--------|
|                    |              |               | Log. meters. | Miles. |
| Shaver (L).....    | 28 40 14.67  | 208 38 57.50  | 3.78782      | .....  |
| Limestone (L)..... | 156 53 38.55 | 336 51 05.20  | 4.17085      | .....  |
| Shaver (M).....    | 28 40 58.06  | 208 39 40.89  | 3.7876154    | 3.818  |
| Limestone (M)..... | 156 54 12.29 | 336 51 39.23  | 4.1707878    | 9.207  |
| Pine (M).....      | 210 33 04.07 | 30 34 14.54   | 3.7223066    | 3.278  |
| Harmon (M).....    | 289 05 31.96 | 109 13 54.22  | 4.3068805    | 12.596 |
| Pointy (M).....    | 313 35 29.08 | 133 39 23.06  | 4.0909358    | 7.661  |

L indicates positions obtained by W. H. Lovell in 1905; M indicates positions obtained by J. B. Metcalfe, jr., in 1916.

**BEARDEN, TUCKER COUNTY, W. VA.**

On Bearden Knob, about 3.5 miles southeast of Davis. Can best be reached from the Davis-Canaan Valley road. The point lies about 0.25 mile north of where this road crosses the divide.

Station mark: Copper bolt set in top of stone 5 by 8 by 30 inches, set 24 inches in ground.

Signals: Targets nailed in old hemlock snag. Instrument over center.

Reference mark: Signal, distance, 20.5 feet; true azimuth,  $277^{\circ} 30' 26''$ .

[Latitude  $39^{\circ} 06' 19.09''$ . Longitude  $79^{\circ} 25' 34.83''$ .]

| To station—   | Azimuth. |    |       | Back azimuth. |    |       | Distance.    |        |
|---------------|----------|----|-------|---------------|----|-------|--------------|--------|
|               | °        | '  | "     | °             | '  | "     | Log. meters. | Miles. |
| Pointy.....   | 26       | 56 | 47.74 | 216           | 54 | 03.08 | 4.0193268    | 6.496  |
| Pine.....     | 110      | 36 | 01.89 | 290           | 30 | 23.23 | 4.1258502    | 8.302  |
| Conneway..... | 182      | 58 | 12.41 | 2             | 58 | 42.67 | 4.3452079    | 13.758 |
| Brown.....    | 215      | 44 | 01.90 | 35            | 46 | 02.49 | 3.8951578    | 4.881  |
| Snow.....     | 234      | 04 | 46.84 | 54            | 08 | 42.45 | 4.040251     | 6.877  |
| Harmon.....   | 328      | 45 | 33.09 | 148           | 47 | 16.52 | 3.8812672    | 4.727  |

**BROWN, TUCKER COUNTY, W. VA.**

On the highest point of Browns Mountain, a bald rocky point with scattering dead trees, about 5 miles east of Davis. Can be best reached by traversing the old Beaver Creek railroad for about 3 miles out of Davis. Turn up the first old switch to the right after the railroad crosses Beaver Creek and follow this old tram road for about 2.5 miles, and then the point will show on the right in a northeast direction, distant about 0.5 mile. It is 0.25 mile north of the divide between Yellow Creek and Little Blackwater.

Station mark: Bronze tablet set in ledge of sandstone rock. The signals are white targets nailed in small hemlock snag, with a small green hemlock tree nailed in top of same.

Reference mark: Signal, distance, 10.5 feet; true azimuth,  $241^{\circ} 21'$ .

[Latitude  $39^{\circ} 09' 45.82''$ . Longitude  $79^{\circ} 22' 23.75''$ .]

| To station—   | Azimuth. |    |       | Back azimuth. |    |       | Distance.    |        |
|---------------|----------|----|-------|---------------|----|-------|--------------|--------|
|               | °        | '  | "     | °             | '  | "     | Log. meters. | Miles. |
| Harmon.....   | 2        | 53 | 10.01 | 182           | 52 | 52.99 | 4.1104924    | 8.014  |
| Bearden.....  | 35       | 49 | 02.49 | 215           | 44 | 01.90 | 3.8951578    | 4.881  |
| Pine.....     | 84       | 26 | 12.01 | 264           | 18 | 42.69 | 4.2349338    | 10.673 |
| Conneway..... | 167      | 42 | 02.36 | 347           | 40 | 31.79 | 4.2070180    | 10.008 |
| Snow.....     | 268      | 30 | 47.14 | 88            | 32 | 42.22 | 3.6111034    | 2.719  |

**HARMON, TUCKER COUNTY, W. VA.**

On the west side of the Alleghany Front, overlooking Canaan Valley, about 10 miles southeast of Davis and 0.75 mile east of Jason Harmon's residence. Can best be reached by riding to field 0.4 mile east of Mr. Harmon's residence, thence walking directly up the mountainside to station.

Station mark: Bronze tablet set in sandstone boulder.

Signal: A small hemlock tree (braced) with white targets. Instrument over center.

Reference mark: Signal tree, distance, 8 feet; true azimuth,  $26^{\circ} 21'$ .

[Latitude  $39^{\circ} 02' 48.12''$ . Longitude  $79^{\circ} 22' 50.75''$ .]

| To station—   | Azimuth. |    |       | Back azimuth. |    |       | Distance.    |        |
|---------------|----------|----|-------|---------------|----|-------|--------------|--------|
|               | °        | '  | "     | °             | '  | "     | Log. meters. | Miles. |
| Pointy.....   | 79       | 46 | 23.40 | 259           | 41 | 55.50 | 4.0168692    | 6.460  |
| Pine.....     | 124      | 17 | 14.88 | 304           | 10 | 02.95 | 4.2989930    | 12.389 |
| Bearden.....  | 148      | 47 | 16.52 | 328           | 45 | 33.09 | 3.8812672    | 4.727  |
| Brown.....    | 182      | 52 | 52.99 | 02            | 53 | 10.01 | 4.1104924    | 8.014  |
| Snow.....     | 201      | 08 | 02.30 | 21            | 10 | 14.27 | 4.1440065    | 8.657  |
| Backbone..... | 169      | 13 | 54.22 | 289           | 05 | 31.90 | 4.3068805    | 12.596 |

## KEYSTONE, GRANT COUNTY, W. VA.

On Keystone ridge on the Alleghany Front, about 6 miles south of Hartmansville, on what is known as the old Karscadden place. The large timber on the point was cut off, except one large umbrella pine, which was used as a signal tree. The instrument was elevated 15 feet in order to see over the small timber.

Station mark: Bronze tablet set in top of sandstone rock 8 by 12 by 30 inches set 25 inches in ground.

Reference mark: Signal tree, distance, 7 feet; true azimuth,  $312^{\circ} 12'$ .

[Latitude  $39^{\circ} 15' 47.25''$ . Longitude  $79^{\circ} 10' 12.64''$ .]

| To station—   | Azimuth. |    |       | Back azimuth. |    |       | Distance.    |        |
|---------------|----------|----|-------|---------------|----|-------|--------------|--------|
|               | °        | '  | "     | °             | '  | "     | Log. meters. | Miles. |
| Snow.....     | 50       | 05 | 19.72 | 229           | 59 | 32.71 | 4.2350200    | 10.675 |
| Conneway..... | 102      | 26 | 01.55 | 282           | 16 | 47.97 | 4.3314605    | 13.329 |
| Schell.....   | 135      | 08 | 44.92 | 315           | 08 | 08.65 | 3.94117      | 5.427  |
| Pinnacle..... | 210      | 45 | 54.07 | 30            | 49 | 22.30 | 4.1868177    | 9.554  |
| Twin.....     | 284      | 48 | 21.53 | 104           | 55 | 13.36 | 4.2082082    | 10.036 |

## LIMESTONE, PRESTON COUNTY, W. VA.

On high point on Limestone Ridge, 7 miles north of St. George, on land owned by Thomas Fansler. Point is 0.25 mile south of Thomas Fansler's house and 500 feet west of county road.

Station mark: Center of lone maple signal tree.

[Latitude  $39^{\circ} 13' 45.1''$  (T),  $39^{\circ} 13' 45.81''$  (M). Longitude  $79^{\circ} 40' 08.3''$  (T),  $79^{\circ} 40' 09.68''$  (M).]

| To station—        | Azimuth. |    |       | Back azimuth. |    |       | Distance.    |        |
|--------------------|----------|----|-------|---------------|----|-------|--------------|--------|
|                    | °        | '  | "     | °             | '  | "     | Log. meters. | Miles. |
| Belington (T)..... | 39       | 00 | 07    | 213           | 52 | 15    | 4.45623      | .....  |
| Laurel (T).....    | 60       | 43 | 55    | 240           | 37 | 54    | 4.19614      | .....  |
| Funk (T).....      | 133      | 10 | 18    | 313           | 06 | 39    | 4.05638      | .....  |
| Rock (T).....      | 166      | 21 | 04    | 346           | 18 | 05    | 4.45809      | .....  |
| Brown (T).....     | 184      | 48 | 30    | 4             | 49 | 07    | 4.25191      | .....  |
| Shaver (T).....    | 351      | 22 | 01    | 171           | 23 | 16    | 4.28398      | .....  |
| Pine (M).....      | 316      | 53 | 09.28 | 136           | 56 | 52.98 | 4.0947814    | 7.729  |
| Backbone (M).....  | 330      | 51 | 39.23 | 156           | 54 | 12.29 | 4.1707878    | 9.207  |
| Shaver (M).....    | 351      | 22 | 24.05 | 171           | 23 | 39.76 | 4.2838730    | 11.946 |

T indicates positions obtained by Sledge Tatum in 1902; M indicates positions obtained by J. B. Metcalf, Jr., in 1916.

## MICHAEL, MINERAL-HAMPSHIRE COUNTIES, W. VA.

On a high knob 8 miles south of Romney. In the Michael Brothers' orchard, about 1 mile south of the old Braddock road crossing.

Station mark: Rock 10 by 8 by 30 inches, set 24 inches in the ground, with U+S cut in top.

Signal: A small hemlock tree braced with white targets nailed in it.

Reference mark: Signal, distance, 7 feet; true azimuth,  $221^{\circ} 49'$ .

[Latitude  $39^{\circ} 25' 20.54''$ . Longitude  $78^{\circ} 47' 25.62''$ .]

| To station— | Azimuth. |    |       | Back azimuth. |    |       | Distance.    |        |
|-------------|----------|----|-------|---------------|----|-------|--------------|--------|
|             | °        | '  | "     | °             | '  | "     | Log. meters. | Miles. |
| Twin.....   | 38       | 15 | 42.04 | 218           | 06 | 08.28 | 4.4433612    | 17.247 |
| Twig.....   | 92       | 54 | 16.73 | 266           | 47 | 54.88 | 4.1585066    | 8.952  |
| Nat.....    | 354      | 45 | 17.37 | 174           | 46 | 06.08 | 4.2954710    | 12.269 |

## NAT, HAMPSHIRE COUNTY, W. VA.

On the highest part of Nathaniel Mountain, about 10 miles south of Romney. This is an old station. The summit was cleared of timber in 1897, except one large tree, which was trimmed and used as a signal.

Station mark: Signal tree of 1897, not found in 1916.

Reference mark: Copper bolt cemented in rock, distance from station, 3.7 feet; azimuth from signal tree,  $212^{\circ} 09'$ . (Not found in 1916.)

## New description, 1916.

Station mark: 10 by 14 by 24 inch stone set in ground with U+S chiseled in top.

Reference mark: 10-inch signal tree, with a triangle cut on east side with spike driven in center. Distance, 22.3 feet; true azimuth,  $124^{\circ} 30'$ .

[Latitude  $39^{\circ} 14' 42.33''$ . Longitude  $78^{\circ} 45' 10.35''$ .]

| To station—       | Azimuth. |    |       | Back azimuth. |    |       | Distance.    |        |
|-------------------|----------|----|-------|---------------|----|-------|--------------|--------|
|                   | °        | '  | "     | °             | '  | "     | Log. meters. | Miles. |
| Twin (M).....     | 83       | 34 | 38.25 | 263           | 26 | 17.74 | 4.2810550    | 11.869 |
| Pinnacle (M)..... | 119      | 45 | 11.13 | 299           | 33 | 25.53 | 4.4871668    | 19.077 |
| Twig (M).....     | 139      | 24 | 19.44 | 319           | 17 | 10.60 | 4.3957705    | 15.457 |
| Michael (M).....  | 174      | 46 | 05.08 | 354           | 45 | 17.37 | 4.2954710    | 12.269 |
| Pinnacle (H)..... | 119      | 45 | 11.13 | 299           | 33 | 25.53 | 4.4871668    | .....  |
| Dan (H).....      | 163      | 33 | 32.50 | 343           | 30 | 33.72 | 4.5906124    | .....  |
| Warrior (H).....  | 197      | 02 | 07.44 | 17            | 07 | 47.97 | 4.6399604    | .....  |

H indicates positions obtained by G. T. Hawkins in 1897-98; M indicates positions obtained by J. B. Metcalf, jr., in 1916.

## PINE, TUCKER COUNTY, W. VA.

On the Backbone Ridge, about 5 miles west of Thomas. Can best be reached by following the Sugar Land road to top of ridge and thence trail south 0.25 mile to signal. The point was heavily timbered, so lines of sight were cut through to observed points. One hemlock tree 16 inches in diameter was left standing for a signal tree. The instrument was elevated 20 feet and was placed over center.

Station mark: Bronze tablet set in boulder.

Reference mark: Signal tree 2 feet distant; true azimuth,  $237^{\circ} 01'$ .

[Latitude  $39^{\circ} 08' 51.22''$ . Longitude  $79^{\circ} 34' 15.66''$ .]

| To station—    | Azimuth. |    |       | Back azimuth. |    |       | Distance.    |        |
|----------------|----------|----|-------|---------------|----|-------|--------------|--------|
|                | °        | '  | "     | °             | '  | "     | Log. meters. | Miles. |
| Backbone.....  | 30       | 33 | 14.54 | 210           | 33 | 04.07 | 3.7223066    | 3.278  |
| Limestone..... | 136      | 56 | 52.98 | 318           | 53 | 09.28 | 4.0947814    | 7.729  |
| Brown.....     | 264      | 18 | 42.69 | 84            | 26 | 12.01 | 4.2349338    | 10.673 |
| Bearden.....   | 290      | 30 | 33.23 | 110           | 36 | 01.89 | 4.1258502    | 8.302  |
| Harmon.....    | 304      | 10 | 02.95 | 124           | 17 | 14.88 | 4.2989930    | 12.349 |
| Pointy.....    | 334      | 25 | 36.57 | 154           | 28 | 20.23 | 4.1602844    | 8.987  |

## PINNACLE, MINERAL COUNTY, W. VA.

On high point of mountain about 12 miles south of Keyser. The station is on a rock that rises above the timber.

A house (fire station) has been built over this point. Dimensions of house are 10 by 10 by 12 feet. The signal was placed on top of roof and over center.

Station mark: (Set in 1897) bronze tablet cemented in solid rock.

[Latitude  $39^{\circ} 22' 55.53''$ . Longitude  $79^{\circ} 04' 44.04''$ .]

## PINNACLE, MINERAL COUNTY, W. VA.—Continued.

| To station—        | Azimuth. |    |       | Back azimuth. |    |       | Distance.    |        |
|--------------------|----------|----|-------|---------------|----|-------|--------------|--------|
|                    | °        | '  | "     | °             | '  | "     | Log. meters. | Miles. |
| Keystone (M).....  | 30       | 49 | 22.30 | 210           | 45 | 54.07 | 4.1868177    | 9.554  |
| Schell (M).....    | 03       | 28 | 03.13 | 243           | 21 | 51.75 | 4.19542      | 9.745  |
| Conneway (M).....  | 78       | 27 | 08.61 | 253           | 14 | 26.01 | 4.4780913    | 18.683 |
| Twig (M).....      | 250      | 34 | 10.32 | 70            | 38 | 47.73 | 4.0448137    | 6.889  |
| Nat (M).....       | 299      | 33 | 25.53 | 119           | 45 | 11.13 | 4.4871668    | 19.077 |
| Twin (M).....      | 335      | 58 | 23.61 | 156           | 01 | 47.82 | 4.2785746    | 11.801 |
| High Rock (H)..... | 175      | 02 | 27.33 | 355           | 01 | 45.68 | 4.2573313    | 11.25  |
| Dan (H).....       | 215      | 03 | 45.41 | 35            | 10 | 40.34 | 4.4331252    | 16.85  |
| Warrior (H).....   | 235      | 54 | 39.53 | 56            | 12 | 08.93 | 4.6768319    | 29.5   |

H indicates positions obtained by G. T. Hawkins in 1897-98; M indicates positions obtained by J. B. Metcalfe, Jr., in 1916.

## POINTY, TUCKER COUNTY, W. VA.

On a high bald rocky point southwest of Canaan Valley. The best way to reach the point is to ride to Ash Nives house, thence by trail past Chimney Rock out ridge 1 mile to signal. All the country to the south and southwest can be seen. Instrument was over center.

Signal: A small hemlock tree nailed in top of an old snag.

Station mark: Bronze tablet set in ledge of sandstone rock.

Reference mark: A hole drilled in large flat rock, 40 feet north of tablet, also signal distance, 61 feet; true azimuth,  $194^{\circ} 00' 56''$ .

[Latitude  $39^{\circ} 01' 48.05''$ . Longitude  $79^{\circ} 29' 56.09''$ .]

| To station—   | Azimuth. |    |       | Back azimuth. |    |       | Distance.    |        |
|---------------|----------|----|-------|---------------|----|-------|--------------|--------|
|               | °        | '  | "     | °             | '  | "     | Log. meters. | Miles. |
| Shaver.....   | 104      | 47 | 41.91 | 284           | 42 | 30.94 | 4.0890744    | 7.628  |
| Backbone..... | 133      | 39 | 23.06 | 313           | 35 | 29.08 | 4.0909388    | 7.661  |
| Pine.....     | 154      | 28 | 20.23 | 334           | 25 | 36.57 | 4.1602844    | 8.987  |
| Bearden.....  | 218      | 54 | 03.08 | 36            | 56 | 47.74 | 4.0193268    | 6.496  |
| Harmon.....   | 259      | 41 | 55.50 | 79            | 46 | 23.40 | 4.0168692    | 6.460  |

## SCHELL, MINERAL COUNTY, W. VA.

A secondary station located about 3 miles south of Schell railroad station on the Western Maryland Railway, about 0.25 mile northwest of J. H. Roderick's house. The point is 12 feet east of a north and south fence and about 30 yards from the Mineral and Grant county line.

Signal: A 16-inch hickory tree standing in the field.

Station mark: A cross cut in the top of a sandstone rock 7 by 10 by 30 inches, set 27 inches in the ground.

Reference mark: Signal tree, distance, 8 feet; true azimuth,  $243^{\circ} 06'$ .

[Latitude  $39^{\circ} 19' 07.96''$ . Longitude  $79^{\circ} 14' 29.77''$ .]

| To station—   | Azimuth. |    |       | Back azimuth. |    |       | Distance.    |        |
|---------------|----------|----|-------|---------------|----|-------|--------------|--------|
|               | °        | '  | "     | °             | '  | "     | Log. meters. | Miles. |
| Snow.....     | 22       | 07 | 55.18 | 202           | 04 | 48.60 | 4.26927      | 11.55  |
| Conneway..... | 83       | 53 | 1.77  | 263           | 46 | 30.77 | 4.17237      | 9.242  |
| Pinnacle..... | 243      | 21 | 51.75 | 63            | 28 | 03.13 | 4.19542      | 9.745  |
| Keystone..... | 315      | 06 | 08.65 | 135           | 08 | 44.92 | 3.94117      | 5.427  |

## SRAVER, TUCKER COUNTY, W. VA.

A high rocky mountain 2 miles south of Hendricks. Can best be reached by crossing river at Hendricks, thence going by trail south about 1 mile, thence over rough, rocky mountain side 1 mile to signal.

Station mark: An aluminum bolt set in solid rock on highest bald summit.

[Latitude 39° 03' 28.6" (T), 39° 03' 29.42" (M). Longitude 79° 38' 08.30" (T), 79° 38' 09.75" (M).]

| To station—        | Azimuth. |    |       | Back azimuth. |    |       | Distance.    |        |
|--------------------|----------|----|-------|---------------|----|-------|--------------|--------|
|                    | °        | '  | "     | °             | '  | "     | Log. meters. | Miles. |
| Laurel (T).....    | 124      | 21 | 26    | 304           | 14 | 10    | 4.30300      |        |
| Limestone (T)..... | 171      | 23 | 16    | 351           | 22 | 01    | 4.28398      |        |
| Limestone (M)..... | 171      | 23 | 39.76 | 351           | 22 | 24.05 | 4.2838730    | 11.946 |
| Backbone (M).....  | 208      | 39 | 40.89 | 28            | 40 | 58.06 | 3.7876164    | 3.810  |
| Pointy (M).....    | 284      | 42 | 30.94 | 104           | 47 | 41.91 | 4.0890744    | 7.628  |

T indicates positions obtained by Sledge Tatum in 1902; M indicates positions obtained by J. B. Metcalfe, Jr., in 1916.

## SNOW, ON GRANT-TUCKER COUNTY LINE, W. VA.

On a high rocky point on the divide between Little Blackwater, Beaver Creek, and Stony River. Can best be reached by following the Dobbin log road from Dobbin to the Canaan water tank (about 10 miles); thence going east uphill  $\frac{1}{4}$  of a mile to the point.

Station mark: Bronze tablet set in ledge of rock.

Signal: A small hemlock tree braced over center with white targets.

[Latitude 39° 09' 49.46". Longitude 79° 19' 21.53".]

| To station—   | Azimuth. |    |       | Back azimuth. |    |       | Distance.    |        |
|---------------|----------|----|-------|---------------|----|-------|--------------|--------|
|               | °        | '  | "     | °             | '  | "     | Log. meters. | Miles. |
| Harmon.....   | 21       | 10 | 14.27 | 201           | 08 | 02.30 | 4.1440065    | 8.657  |
| Bearden.....  | 54       | 08 | 42.45 | 234           | 04 | 46.84 | 4.0440251    | 6.877  |
| Brown.....    | 88       | 32 | 42.22 | 268           | 30 | 47.14 | 3.6411034    | 2.719  |
| Conneway..... | 153      | 29 | 04.63 | 333           | 25 | 38.80 | 4.2421769    | 10.862 |
| Schell.....   | 202      | 04 | 48.00 | 22            | 07 | 55.18 | 4.26927      | 11.551 |
| Keystone..... | 229      | 59 | 32.71 | 50            | 05 | 19.72 | 4.2350200    | 10.675 |
| Twin.....     | 236      | 26 | 10.69 | 76            | 28 | 48.96 | 4.4713915    | 18.397 |

## TWIG, MINERAL COUNTY, W. VA.

On the Knobby Mountain Range, in the highest point of the Twig orchard, about 4.5 miles east of Keyser.

Station mark: Bronze tablet set in limestone rock 8 by 16 by 30 inches, set 24 inches in the ground, 2 feet from a peach tree. The instrument was elevated 15 feet in order to see over the peach tree.

Signal: A pine tree 25 feet high was trimmed, except the top. Distance from mark to signal, 4.5 feet; true azimuth, 358° 34'.

[Latitude 39° 24' 54.90". Longitude 78° 57' 26.98".]

| To station—   | Azimuth. |    |       | Back azimuth. |    |       | Distance.    |        |
|---------------|----------|----|-------|---------------|----|-------|--------------|--------|
|               | °        | '  | "     | °             | '  | "     | Log. meters. | Miles. |
| Twin.....     | 7        | 27 | 07.20 | 187           | 25 | 54.52 | 4.3265464    | 13.179 |
| Pinnacle..... | 70       | 38 | 47.73 | 250           | 34 | 10.32 | 4.0448137    | 6.889  |
| Michael.....  | 266      | 47 | 54.88 | 88            | 54 | 16.73 | 4.1585666    | 8.952  |
| Nat.....      | 319      | 17 | 10.60 | 139           | 24 | 19.44 | 4.3957705    | 15.457 |

## TWIN, ON GRANT-HARDY COUNTY LINE, W. VA.

On the highest point of Twin Mountain, 0.25 mile east of Twin Mountain railroad station.

Signal: An 18-inch hickory tree. The signal tree has a triangle cut on the south side, and a 60-penny spike is driven in the center of the triangle. The instrument was elevated 25 feet in order to see Michael station.

Station mark: A 4 by 8 by 36-inch limestone rock set 30 inches in the ground with U+S chiseled in top.

Reference mark: Signal tree, distance, 4 feet; true azimuth,  $300^{\circ} 30'$ .

[Latitude  $39^{\circ} 13' 32.90''$ . Longitude  $78^{\circ} 59' 21.66''$ .]

| To station—   | Azimuth. |    |       | Back azimuth. |    |       | Distance.    |        |
|---------------|----------|----|-------|---------------|----|-------|--------------|--------|
|               | "        | '  | "     | "             | '  | "     | Log. meters. | Miles. |
| Snow.....     | 76       | 33 | 48.96 | 256           | 26 | 10.69 | 4.4713915    | 18.397 |
| Keystone..... | 104      | 55 | 13.36 | 284           | 48 | 21.53 | 4.2082082    | 10.036 |
| Pinnacle..... | 156      | 01 | 47.82 | 335           | 58 | 23.61 | 4.2785745    | 11.801 |
| Twig.....     | 187      | 25 | 54.52 | 7             | 27 | 07.20 | 4.3265464    | 13.179 |
| Michael.....  | 218      | 06 | 08.28 | 38            | 13 | 42.04 | 4.4433612    | 17.247 |
| Nat.....      | 263      | 26 | 17.74 | 83            | 34 | 38.25 | 4.2810550    | 11.869 |