REPORT

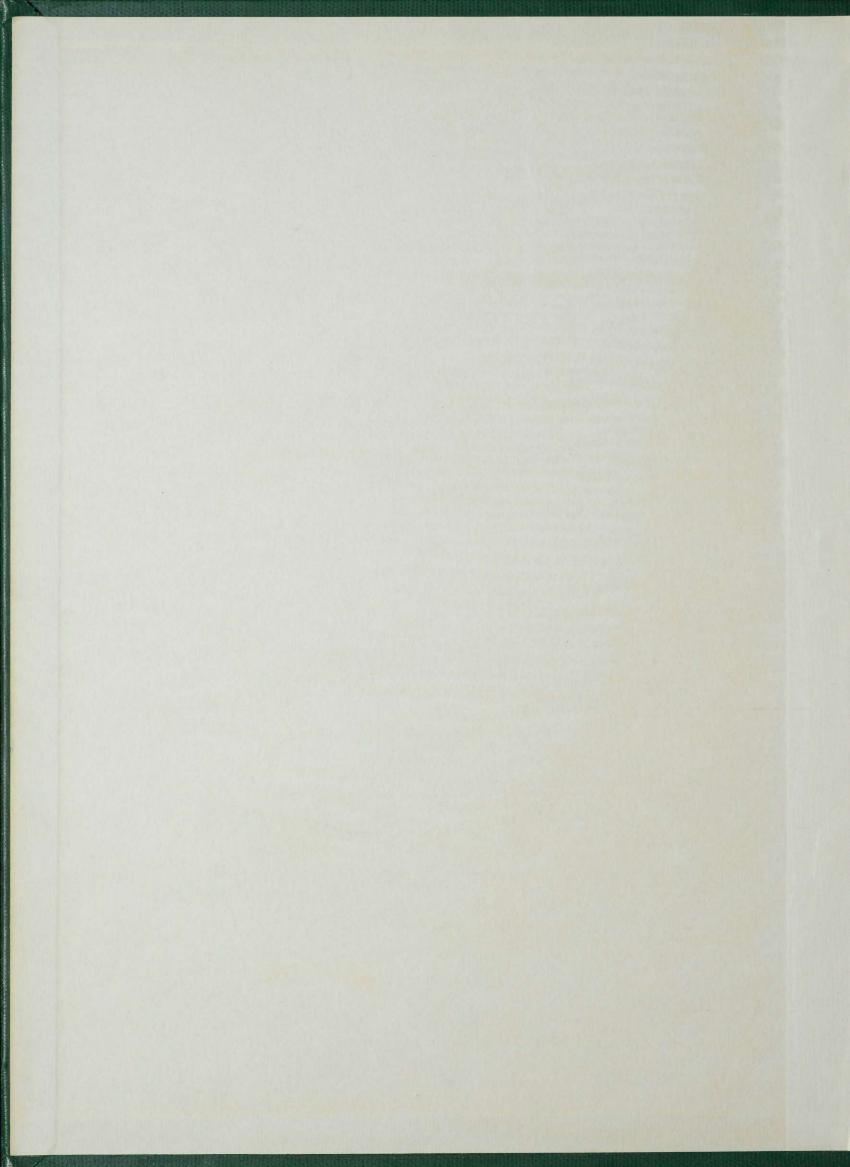
INTERNATIONAL BOUNDARY COMMISSION

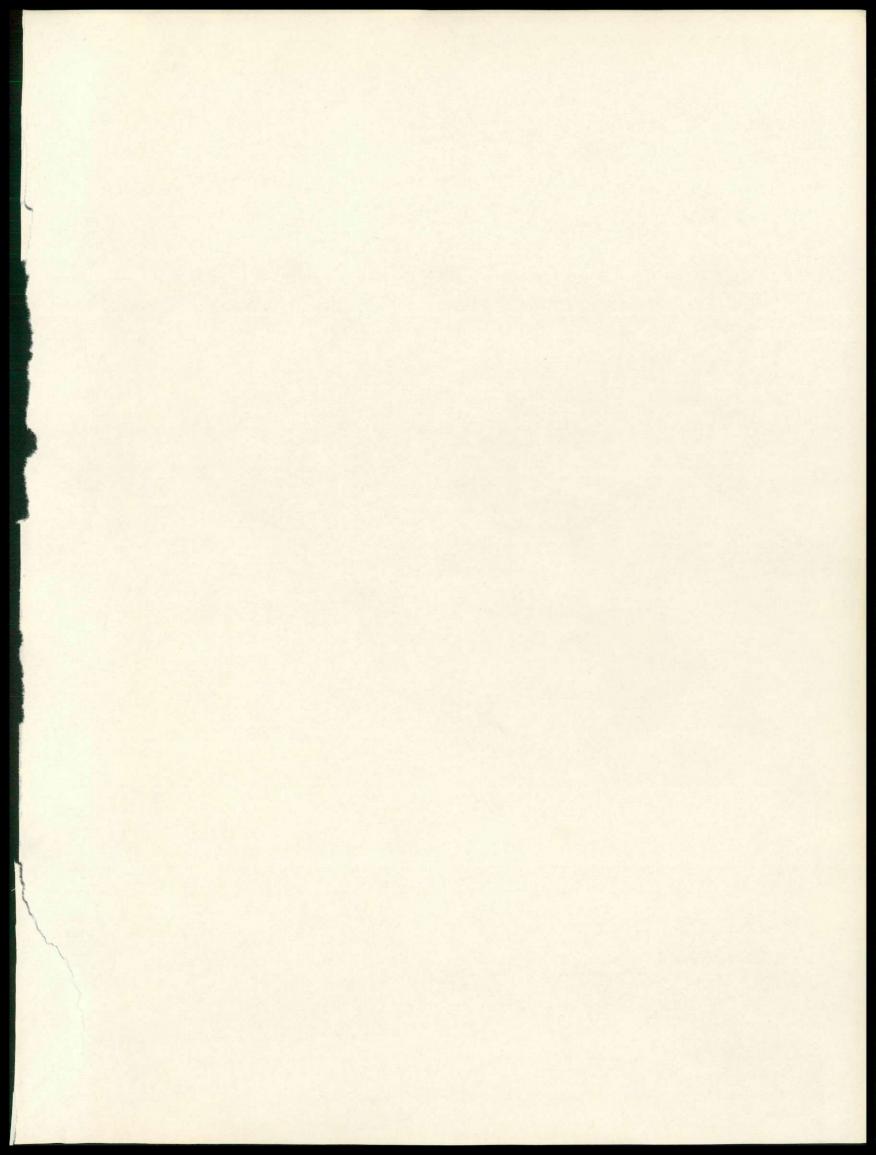
REESTABLISHMENT OF THE BOUNDARY BETWEEN THE UNITED STATES AND CANADA

GULF OF GEORGIA TO NORTHWESTERNMOST POINT OF LAKE OF THE WOODS

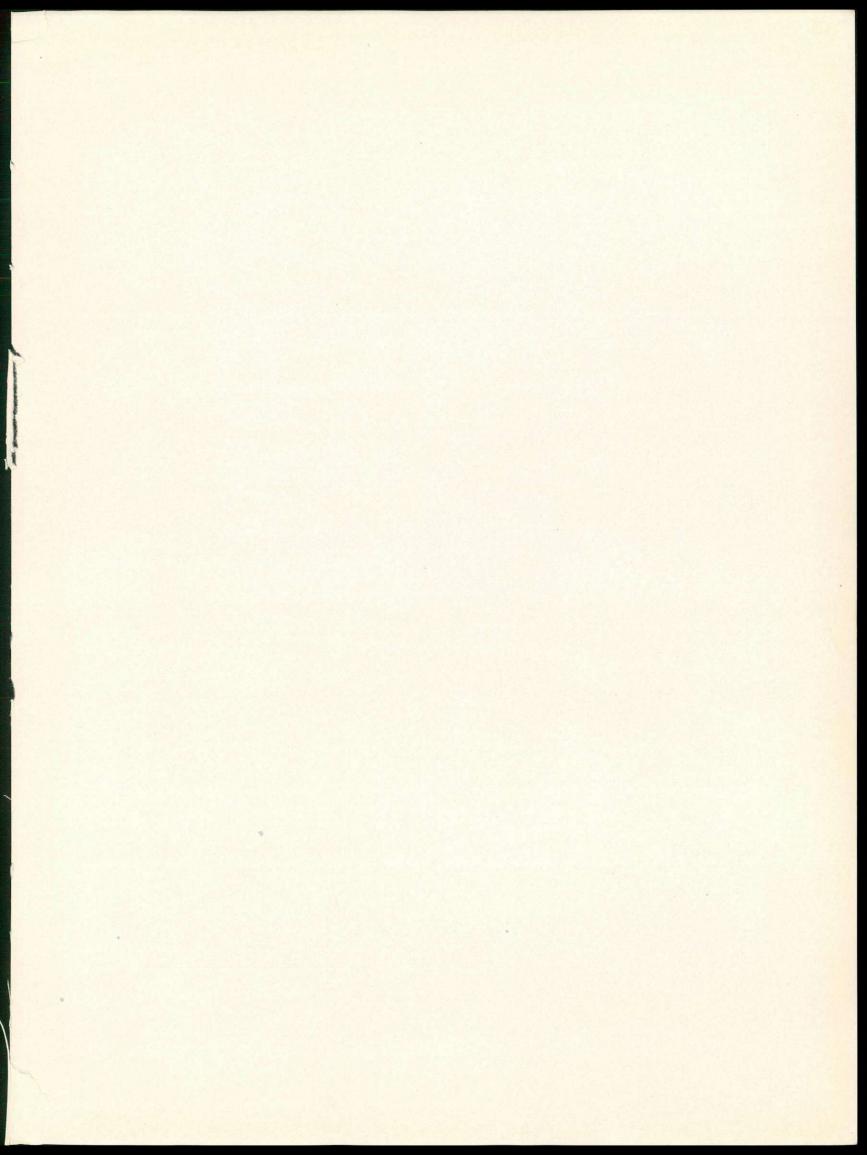


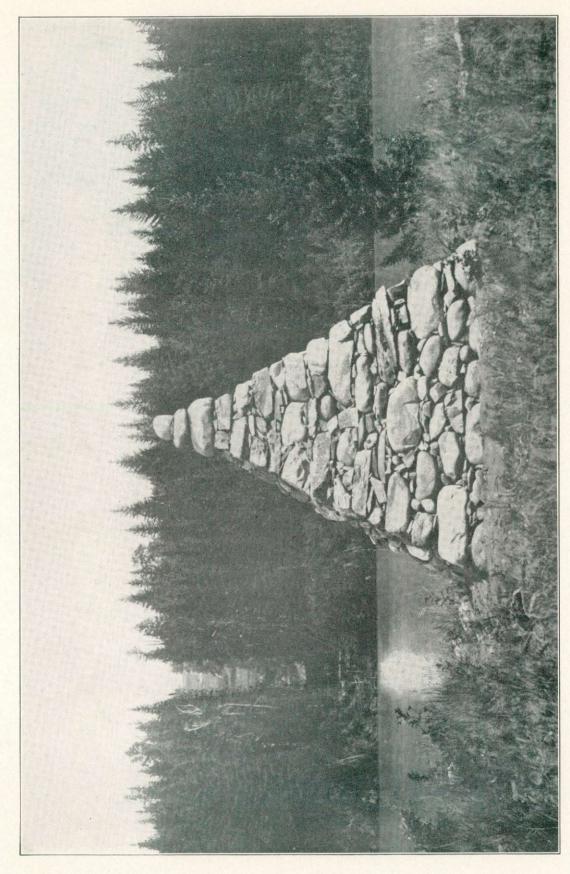
OTTAWA 1937











VISTA AND ORIGINAL BOUNDARY CAIRN 152 ON THE WEST BANK OF THE EAST CROSSING OF THE KOOTENAI RIVER. THE CAIRN WAS ERECTED BY THE UNITED STATES SECTION OF THE COMMISSION IN 1860. IT IS NOW REPLACED BY MONUMENT 243. PHOTOGRAPH BY THE BRITISH SECTION OF THE COMMISSION IN 1861

INTERNATIONAL BOUNDARY COMMISSION

JOINT REPORT

UPON THE

SURVEY AND DEMARCATION OF THE BOUNDARY

BETWEEN THE

UNITED STATES AND CANADA

FROM THE GULF OF GEORGIA TO THE NORTHWESTERNMOST POINT OF LAKE OF THE WOODS

IN ACCORDANCE WITH THE PROVISIONS OF ARTICLES VI AND VII OF THE TREATY SIGNED AT WASHINGTON APRIL 11, 1908, AND ARTICLES I, II, AND IV OF THE TREATY SIGNED AT WASHINGTON FEBRUARY 24, 1925

HIS BRITANNIC MAJESTY'S COMMISSIONER

W. F. KING, 1908–1916 J. J. McARTHUR, 1917–1924 J. D. CRAIG, 1925–1931 NOEL J. OGILVIE, 1931– UNITED STATES COMMISSIONER

O. H. TITTMANN, 1908–1915 E. C. BARNARD, 1915–1921 E. LESTER JONES, 1921–1929 JAMES H. VAN WAGENEN, 1929–1935 THOMAS RIGGS, 1935–



UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON: 1937

PUBLISHED UNDER THE AUTHORITY OF THE INTERNATIONAL BOUNDARY COMMISSIONERS

LETTER OF TRANSMITTAL

Washington, October 27, 1937.

The Right Honourable

The Secretary of State for External Affairs of Canada, Ottawa.

The Honourable

The Secretary of State of the United States, Washington.

SIRS:

We have the honour to submit herewith our printed joint report upon the reestablishment of the section of the International Boundary between Canada and the United States from the Gulf of Georgia to the Northwesternmost Point of Lake of the Woods, together with an atlas of fifty-nine signed joint maps of the boundary as now reestablished, in accordance with the provisions of Articles VI and VII of the treaty between Great Britain and the United States signed at Washington April 11, 1908, and of Articles I, II, and IV of the treaty between His Britannic Majesty in respect of Canada and the United States signed at Washington February 24, 1925.

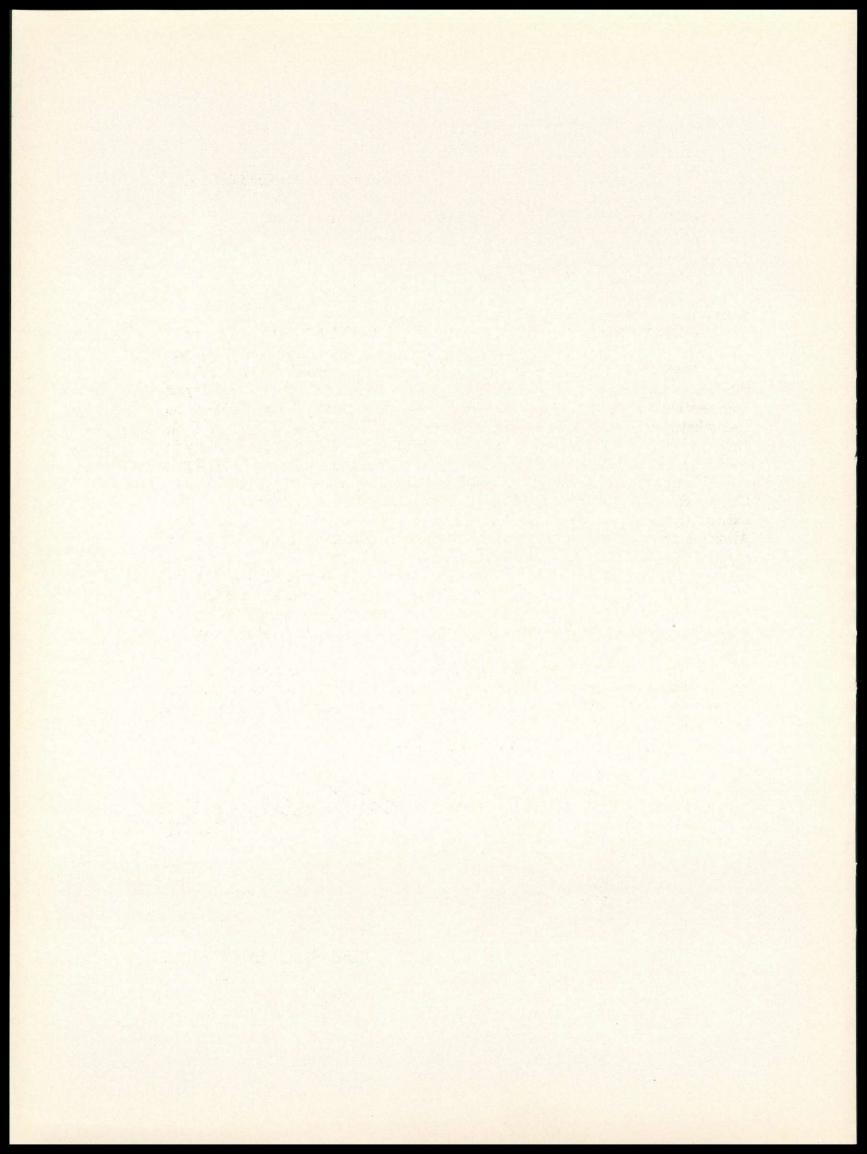
This report is the sixth of a series of seven final reports being prepared by the Commissioners on the survey and demarcation of the several sections of the International Boundary Line between Canada and the United States and Canada and Alaska in accordance with the provisions of existent boundary treaties. The seven reports, together with their accompanying maps, will cover the entire boundary between Canada and the United States and between Canada and Alaska, with the exception of that part of the boundary, through the St. Lawrence River and the Great Lakes, which was reestablished and reported upon by the International Waterways Commission under the special provisions of Article IV of the treaty of April 11, 1908.

The signed originals of the report and the originals of each of the fifty-nine boundary maps have been prepared in quadruplicate and two of the original reports and two sets of the original maps, bound in atlas form, are transmitted herewith to each Government.

Very truly yours,

His Britannic Majesty's Commissioner.

United States Commissioner.



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INTRODUCTION

The report herewith submitted covers the reestablishment and remonumenting of the International Boundary Line between the United States of America and the Dominion of Canada from the Gulf of Georgia (Georgia Strait) to the Northwesternmost Point of Lake of the Woods. It has been prepared in accordance with the requirements and provisions of articles VI and VII of the treaty concluded between the United States and Great Britain April 11, 1908. The report includes a complete account of the field and office work done by the Commissioners and a certified description and definition of this section of the boundary line.

The boundary line, surveyed and marked and herein described and defined, is a reestablishment of parts of the International Boundary adopted under article II of the Convention of London of 1818, under article II of the Webster-Ashburton Treaty of 1842, and under article I of the treaty of 1846. It conforms with the articles of the above treaties except as modified by articles I and II of the treaty of 1925.

The boundary begins at the eastern shore of Georgia Strait and follows the original astronomic determination of the parallel of 49° of north latitude to a point in Lake of the Woods, whence it runs north to the point in Northwest Angle Inlet of Lake of the Woods described in article I of the treaty of 1925. The part of the line which follows the astronomic determination of the forty-ninth parallel is commonly called the 49th parallel land boundary and the north-and-south portion of it is generally referred to as the meridian boundary.

Beginning at tidewater, the line crosses the main continental divide, and extends for nearly 1,300 miles inland to the heart of the continent. The country traversed varies greatly in physical features, climate, and vegetation and so, correspondingly, varies in natural and economic resources and accessibility. These variations have had effect on the settlement and occupancy of the adjacent territory and so upon the need and method of defining and marking the boundary itself.

Historically as well as geographically the boundary from Georgia Strait to the Northwesternmost Point of Lake of the Woods is divided by the summit of the Rocky Mountains into two parts, which for convenience are referred to as "west of the summit of the Rocky Mountains" and "east of the summit of the Rocky Mountains."

The lengths of these parts of the boundary are: 49th parallel land boundary west of the summit of the Rocky Mountains, 410.2 miles; 49th parallel boundary east of the summit of the Rocky Mountains, 860.0 miles; meridian boundary, 26.7 miles; a total of 1,296.9 miles.

The border Provinces and States from west to east are the Provinces of British Columbia, Alberta, Saskatchewan, and Manitoba on the north and the States of Washington, Idaho, Montana, North Dakota, and Minnesota on the south.

¹ Treaty of 1925, p. 11; map, p. 138.

The boundary west of the summit of the Rocky Mountains was adopted under article I of the treaty of 1846. It was first determined and marked upon the ground in 1857–61 by Commissioners representing the Governments of the United States and Great Britain.² The boundary as laid down by the Commissioners was shown by them on a series of maps, seven in number, accompanied by an index map. The maps are dated May 7, 1869, and are signed by the Commissioners and surveyors of the respective Governments. The maps and "the marks by which the boundary to the eastern shore of the Gulf of Georgia has been defined upon the ground" were approved, agreed to, and adopted through a declaration to that effect signed on February 24, 1870, for the United States by Hamilton Fish, Secretary of State, and for Great Britain by Sir Edward Thornton, Minister to the United States.

At the time the Commissioners of 1857–69 marked the boundary, the country adjacent thereto was sparsely inhabited and, in the high mountainous sections, settlement appeared to be unlikely to soon occur. Taking into consideration the great expenditure of time and money that would be required to completely mark the boundary through the heavily timbered and mountainous country, the Commissioners marked the line only through settled regions and at prominent stream crossings. The intervals between marked sections were in some cases as much as 25 miles. As transportation facilities improved and increased, the country on both sides of the boundary became more populated, demanding a more definite and complete marking on the ground. In 1898 questions as to the adequacy of the markings of this boundary began to arise; in 1899 similar problems arose regarding the New York-Quebec line. In 1900 the Privy Council of Canada adopted a report (approved May 26, 1900) proposing that the two Governments join in making an examination of and in re-marking where necessary "the whole of the southern boundary of Canada, wherever it has been surveyed by the various commissions appointed for that purpose."

The questions regarding the boundary from Georgia Strait to the summit of the Rocky Mountains being the most urgent, a joint examination of it was made in 1901 and 1902. In 1902 and 1903 an agreement was reached through an exchange of notes providing for retracing and remonumenting it under concurrent action, which was done in the years 1903 to 1908. Finally, the treaty of 1908 was adopted providing for the more complete definition and demarcation of the International Boundary between the United States and the Dominion of Canada from the Atlantic Ocean to the Pacific Ocean.

The boundary from the summit ³ of the Rocky Mountains to the Northwest-ernmost Point of Lake of the Woods was first adopted under article II of the Convention of London of 1818 and was again described, as "according to existing treaties", in article II of the Webster-Ashburton Treaty of 1842. The terminus at the Northwesternmost Point of Lake of the Woods was modified by the treaty of 1925 "in order to provide for a more practical definition of the boundary."

² For methods of determining and marking, see p. 210.

³ See discussion relative to summit (appendix III, p. 196.)

The boundary east of the Rocky Mountains passes over the vast expanse of the Great Plains section of the continent, where a rigorous climate delayed settlement to a period later than that of the country west of the mountains. The plains section was first surveyed 4 and marked in 1872–75, the work being done jointly by Commissioners appointed by the two Governments. The open character of the country rendered operations comparatively simple and the line was surveyed and marked at frequent intervals. Many of the marks, however, were nothing more than mounds of earth or cairns, and by 1908 they had deteriorated so greatly that they were scarcely recognizable. It was evident that monuments of a more conspicuous and permanent character were needed for effective demarcation. Gradually increasing settlement gave rise, also, to a demand for more frequent marks.

After completing the reestablishment and remonumenting of this section of the boundary in 1914, several minor surveys, necessary to complete the records, were made on the line both east and west of the summit of the Rocky Mountains.

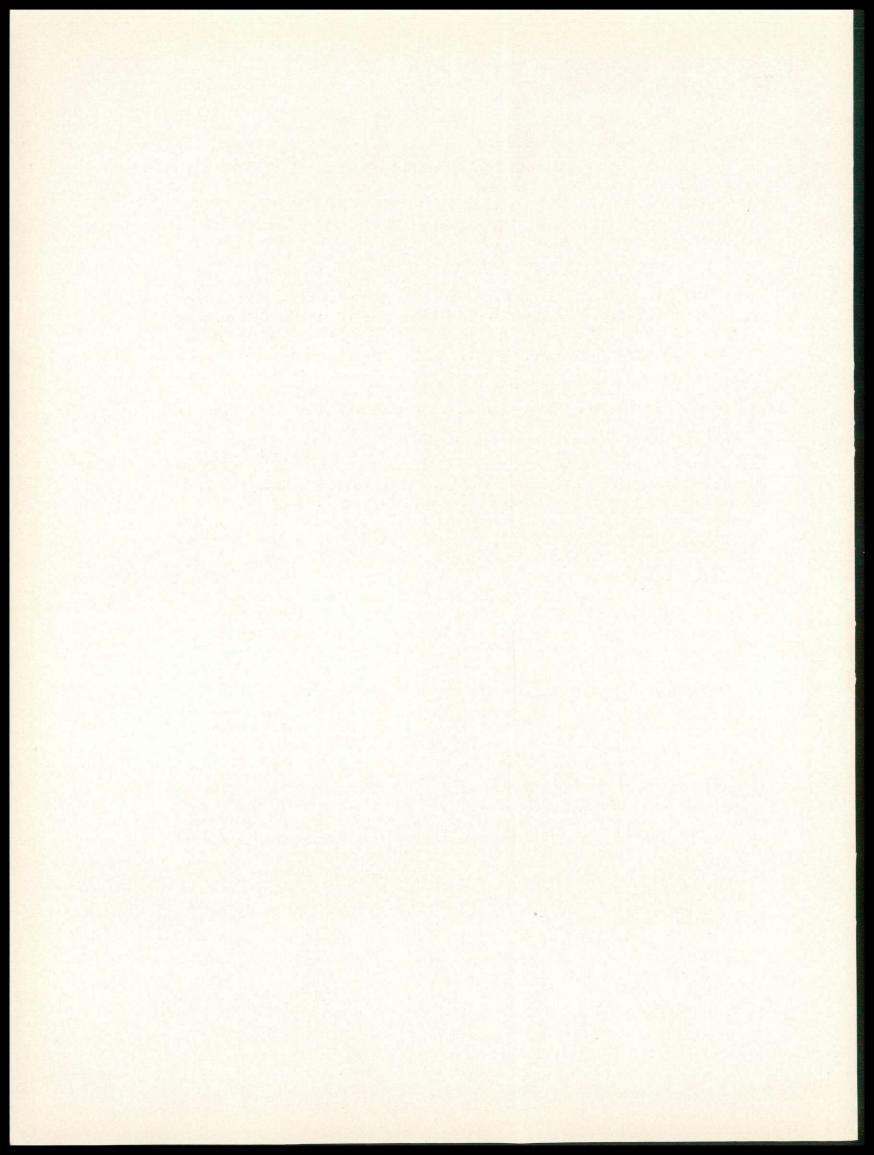
Maintenance has been carried on under the provisions of article IV of the treaty of 1925.

The operations of the Commissioners in carrying out the instructions of their Governments under the concurrent action of 1902–3, the provisions of articles VI and VII of the treaty of 1908, and, later, the provisions of articles I, II, and IV of the treaty of 1925 are fully set forth in this report.

The duties of the Commissioners were increased from time to time up to 1908 until they embraced the work of surveying and marking the entire boundary between the United States and Canada and between Alaska and Canada, with the exception of that portion of the line through the St. Lawrence River and the Great Lakes,⁵ resulting at times in the breaking of the continuity of both field and office work on a particular section of the boundary in order to best serve immediate wants elsewhere. This explains the lapse of time between the date of printing the first of the series of charts or maps and the date of printing the last of the series. The delay in the publication of this report was due in part to the same causes, and in part to the fact that about the time of the completion of the maps, arrangements were being perfected between the United States Coast and Geodetic Survey and the Geodetic Survey of Canada to carry a belt of first-order triangulation along the International Boundary from the Pacific Ocean to Lake Superior. The completion of this work was awaited to enable the Commissioners to publish the geodetic positions of the boundary marks on the latest North American datum.

⁴ For method of ascertaining and marking see p. 217.

⁵ Article IV of the treaty of 1908 expressly provides for the International Waterways Commission to "ascertain and reestablish" the International Boundary through the St. Lawrence River and the Great Lakes.



TREATIES OF 1908 AND 1925, APPOINTMENTS OF THE COM-MISSIONERS, AND RESERVATION OF LANDS ALONG THE INTERNATIONAL BOUNDARY

TREATY BETWEEN THE UNITED STATES OF AMERICA AND THE UNITED KINGDOM CONCERNING THE BOUNDARY BETWEEN THE UNITED STATES AND THE DOMINION OF CANADA FROM THE ATLANTIC OCEAN TO THE PACIFIC OCEAN

Signed at Washington, April 11, 1908

(Ratifications exchanged at Washington, June 4, 1908)

The United States of America and His Majesty Edward the Seventh, of the United Kingdom of Great Britain and Ireland, and of the British Dominions beyond the Seas, King, and Emperor of India, being desirous of providing for the more complete definition and demarcation of the international boundary between the United States and the Dominion of Canada, have for that purpose resolved to conclude a treaty, and to that end have appointed as their Plenipotentiaries:

The President of the United States of America, Elihu Root, Secretary of State of the United

States; and

His Britannic Majesty, Right Honorable James Bryce, O. M., his Ambassador Extraordinary and Plenipotentiary at Washington;

Who, after having communicated to each other their respective full powers, which were found to be in due and proper form, have agreed to and concluded the following articles:

ARTICLE I

THE BOUNDARY THROUGH PASSAMAQUODDY BAY

The High Contracting Parties agree that each shall appoint, without delay, an expert geographer or surveyor to serve as Commissioners for the purpose of more accurately defining and marking the international boundary line between the United States and the Dominion of Canada in the waters of Passamaquoddy Bay from the mouth of the St. Croix River to the Bay of Fundy, and that in defining and marking said boundary line the Commissioners shall adopt and follow, as closely as may be, the line surveyed and laid down by the Commissioners appointed under Article II of the Treaty of July 22, 1892, between the United States and Great Britain, so far as said Commissioners agreed upon the location of said line, namely:

(1) From a point at the mouth of the St. Croix River defined by the ranges established by them, by a connected series of six straight lines defined by ranges and cross ranges, to a point between Treat Island and Friar Head, likewise defined by ranges and cross ranges established by them; and also

(2) From a point in Quoddy Roads, defined by the intersection of the range passing through the position of the Beacon of 1886 and Lubec Channel Light, with a range established by them on the west shore of Quoddy Roads along the course of this latter range, which is about 80° 35′ east of true south, into the Bay of Fundy.

In ascertaining the location of the above-described line, the Commissioners shall be controlled by the indications of the range marks and monuments established along its course by said former Commissioners and by the charts upon which the said Commissioners marked the line as

tentatively agreed upon by them.

The remaining portion of the line, lying between the two above-described sections, and upon the location of which said former Commissioners did not agree, shall pass through the center of the Lubec Narrows Channel between Campo Bello Island and the mainland, and, subject to the provisions hereinafter stated, it shall follow on either side of the said Narrows such courses as will connect with the parts of the line agreed upon as aforesaid, and such boundary shall consist of a series of straight lines defined by distances and courses; but inasmuch as differences have arisen in the past as to the location of the line with respect to Pope's Folly Island above Lubec Narrows and with respect to certain fishing grounds east of the dredged channel below Lubec Narrows, it is agreed that each of the High Contracting Parties shall present to the other within six months after the ratification of this Treaty a full printed statement of the evidence, with certified copies of original documents referred to therein which are in its possession, and the arguments upon which it bases its contentions, with a view to arriving at an adjustment of the location of this portion of the line in accordance with the true intent and meaning of the provisions relating thereto of the treaties of 1783 and 1814 between the United States and Great Britain, and the award of the Commissioners appointed in that behalf under the treaty of 1814; it being understood that any action by either or both Governments or their representatives authorized in that behalf or by the local governments on either side of the line, whether prior or subsequent to such treaties and award, tending to aid in the interpretation thereof, shall be taken into consideration in determining their true intent and meaning. Such agreement, if reached, shall be reduced to writing in the form of a protocol and shall be communicated to the said Commissioners, who shall lay down and mark this portion of the boundary in accordance therewith and as herein provided.

In the event of a failure to agree within six months after the date of exchanging the printed statements aforesaid, the question of which Government is entitled to jurisdiction over such island and fishing grounds under treaty provisions, and proceedings thereunder, interpreted in accordance with their true intent and meaning as above provided, and by reason of any rights arising under the recognized principles of international law, shall be referred forthwith for decision upon the evidence and arguments submitted as aforesaid, with such additional statement of facts as may be appropriate, and an argument in reply on each side, to an arbitrator to be agreed upon by the two Governments, or, in case of a failure to agree, to be appointed by a third Power selected by the two Governments by common accord, or, if no agreement is thus arrived at, each Government shall select a different Power and the choice of the arbitrator shall be made in concert by the Powers thus selected. The decision of such arbitrator shall be final, and the line shall be laid down and marked by the said Commissioners in accordance therewith and as herein provided.

The arbitrator shall be requested to deliver, together with his award, a statement of all the costs and expenses incurred by him in connection with the arbitration, which shall forthwith be

repaid by the two Governments in equal moieties.

It is further agreed that if, under the foregoing provisions, the boundary be located through the channel to the east of the dredged channel above mentioned, the latter shall be equally free and open for the passage of ships, vessels, and boats of both parties.

The entire boundary shall be marked by permanent range marks established on land and, if desirable in the opinion of Commissioners, by buoys in the water, so far as practicable, and by such other boundary marks and monuments and at such points as the Commissioners may determine to be necessary; but the said Commissioners shall proceed to define and mark and chart the portion of the line agreed upon by the former Commissioners under the Treaty of 1892 aforesaid without waiting for the final determination of the location of the remaining portion of the line.

The course of the said boundary line as defined and marked as aforesaid shall be laid down by said Commissioners on quadruplicate sets of accurate modern charts prepared or adopted by them for that purpose, which charts shall be certified and signed by the Commissioners, and two duplicate originals thereof shall be filed by them with each Government; and they shall also prepare in duplicate and file with each Government a joint report or reports under their hands and seals describing in detail the course and location of the boundary line and the range marks and monuments and buoys marking it.

The line so defined and laid down shall be taken and deemed to be the international boundary from the Bay of Fundy to the mouth of the St. Croix River, as established by treaty provisions and the proceedings thereunder.

ARTICLE II

THE BOUNDARY FROM THE MOUTH TO THE SOURCE OF THE ST. CROIX RIVER

Whereas Article II of the Treaty of 1783 between the United States and Great Britain provides that a line drawn along the middle of the River St. Croix from its mouth in the Bay of Fundy to its source shall be, between those points, the international boundary between the United States and the British possessions in North America, and the identity of the River St. Croix has been determined by the Commissioners appointed for that purpose under Article V of the Treaty of 1794 between the United States and Great Britain, and the location of the mouth and the source of said river has been duly established, and the course of said river has been described, surveyed, and charted by said Commissioners, as appears from their joint report dated the 25th day of October, 1798, and from the chart or plan of said river prepared and filed by them with said report, but said line of boundary along the middle of said river was not laid down by them on said chart or plan, and was not marked or monumented by them along the course of said river; and whereas, pursuant to an additional article, dated March 15, 1798, supplementing the provisions of the Treaty of 1794 above referred to, a monument was erected by joint action of the two Governments marking the source of the River St. Croix, but said line of boundary through the River St. Croix has not otherwise been monumented and has never been laid down on charts by joint action of the two Governments: therefore, in order to complete and render thoroughly effective the demarcation of the boundary described and established as aforesaid,

It is agreed that each of the High Contracting Parties shall appoint, without delay, an expert geographer or surveyor as a Commissioner, and the Commissioners so appointed shall jointly lay down upon accurate modern charts, to be prepared or adopted by them for that purpose, the line of boundary along the middle of the River St. Croix from its mouth to its source as defined and established by the existing treaty provisions and the proceedings thereunder, above referred to, with the agreed understanding, however, that the line of boundary through said river shall be a water line throughout and shall follow the center of the main channel or thalweg as naturally existing, except where such course would change, or disturb, or conflict with the national character of an island as already established by mutual recognition and acquiescence, in which case the line shall pass on the other side of any such island, following the middle of the channel nearest thereto, or, if the Commissioners find that the national character of any island is in dispute, the question of its nationality shall be submitted by them to their respective Governments, with a chart or map certified jointly by said Commissioners, showing the depth and volume of the water at its high and low stages between such island and the river banks on each side and indicating the course of the main channel of the river as it passes such island, together with a descriptive statement by said Commissioners showing the reasons for selecting such channel as the main channel; and in all such cases the High Contracting Parties agree that the location of the boundary with respect to each island in dispute shall be determined and settled in accordance with the following rules:

(1) The nationality of each island in dispute shall be determined by the predominance of the claims established on either side to such island, arising from the exercise of jurisdiction and sovereignty over it, including such exercise of jurisdiction by the local governments on either side of the line.

(2) The burden of proving the nationality of any such island shall be upon the party seeking to change the general course of the boundary as above prescribed so as to include such island on

its own side of the boundary.

(3) The selection by the Commissioners of the main channel passing such island shall not be conclusive upon the parties hereto and is subject to review, but the burden of proving the main channel to be other than the one selected shall be upon the party proposing the change.

The Government proposing such change in the prescribed course of the boundary shall, upon the submission of the question of the nationality of any island or islands by the Commissioners as aforesaid, promptly present to the other Government a printed statement, with certified copies of any original documents in its possession referred to therein, showing the grounds and arguments upon which its claim of jurisdiction and ownership with respect to such island rests. Unless an agreement is reached upon the presentation of such statement, the Government to which such statement is presented shall within six months after its receipt present in reply a similar statement showing the grounds and arguments upon which the claims of the other Government are contested. If an agreement is reached between the two Governments, it shall be reduced to writing in the form of a protocol and shall be communicated to the said Commissioners, who shall proceed to lay down and mark the boundary so as to leave such island on the side of the boundary to which it is shown it belongs, in accordance with the determination of its nationality arrived at as aforesaid.

In the event of a failure by the two Governments to come to an agreement within six months after the presentation of the printed statements in reply herein above provided for, then the question of the nationality of the islands in dispute shall be referred forthwith for decision under the rules herein above set forth for the determination of that question, and under the recognized principles of international law not inconsistent therewith, and upon the evidence and arguments submitted as aforesaid, with such additional statement of facts as may be appropriate, and such further printed argument on each side as may be desired, to an arbitrator to be agreed upon by the two Governments, or, in case of a failure to agree, to be appointed by a third Power selected by the two Governments by common accord, or, if no agreement is thus arrived at, each Government shall select a different Power and the choice of the arbitrator shall be made in concert by the Powers thus selected. The decision of such arbitrator shall be final, and the line shall be laid down and marked by the said Commissioners in accordance therewith and as herein provided.

The arbitrator shall be requested to deliver, together with his award, a statement of all the costs and expenses incurred by him in connection with the arbitration, which shall forthwith

be repaid by the two Governments in equal moieties.

It is further agreed that so far as practicable the said Commissioners shall establish boundary monuments and ranges and buoys marking the course and location of the said line, and showing on which side of the boundary the several islands lying in said river belong, wherever in their judgment it is desirable that the boundary be so marked.

The charts upon which the boundary is marked as aforesaid shall be in quadruplicate, and shall be certified and signed by said Commissioners, and two duplicate originals thereof shall be filed by them with each Government, and it shall also be the duty of said Commissioners to prepare in duplicate, and file with each Government, a joint report under their hands and seals describing the line so marked by them and the monuments and range marks and buoys marking it.

The line so defined and laid down shall be taken and deemed to be the international boundary from the mouth to the source of the St. Croix River as established by treaty provisions and the proceedings thereunder as aforesaid.

ARTICLE III

The Boundary from the Source of the St. Croix River to the St. Lawrence River

Whereas the remonumenting of the course of the boundary defined and laid down under the provisions of Articles I and VI of the Treaty of August 9, 1842, between the United States and Great Britain has already been undertaken without a formal treaty agreement, but by the joint and concurrent action of the Governments of the United States and Great Britain, certain monuments between Vermont and Canada having been relocated in 1849, and the portion of said boundary extending between Hall's Stream and the St. Lawrence River in part having been remonumented in recent years and in part is now being remonumented under such action on both sides; and whereas the Commissioners appointed under Article VI of the Treaty of 1842 aforesaid were required to and did mark by monuments the land portion only of said line, and were not required to and did not mark by monuments the portions of the boundary extending along water courses, with the exception that the nationality of the several islands in the St. John River was indicated by monuments erected thereon and a series of monuments was placed by them along the edge of certain of the water courses to fix the general direction of the boundary, most of which monuments have since disappeared, but the entire boundary, including its course through the waterways as well as on land, was charted and marked on maps by said Commissioners under the provisions of Article VI above referred to, and the nationality of the respective islands in the St. John River was determined by them, as appears from the joint report filed by said Commissioners dated June 28, 1847, and the series of maps signed by said Commissioners and filed with their joint report; and whereas the portion of the line through said waterways has not since been monumented or marked along its course by joint action of the two Governments, and the monuments placed by said Commissioners along the land portion of said boundary require repairing and renewing where such work has not already been done in recent years, and additional or supplementary intermediate monuments at convenient points are required under modern conditions: therefore, in order to carry on and complete the work already undertaken as aforesaid, and to reestablish the location of said boundary and render thoroughly effective the demarcation of the said boundary as existent and established,

It is agreed that each of the High Contracting Parties shall appoint, without delay, an expert geographer or surveyor as a Commissioner, and under the joint direction of such Commissioners the lost or damaged boundary monuments shall be relocated and repaired, and additional monuments and boundary marks shall be established wherever necessary in the judgment of the Commissioners to meet the requirements of modern conditions along the course of the land portion of said boundary, and where the said boundary runs through waterways it shall be marked along its course, so far as practicable, by buoys and monuments in the water and by permanent ranges established on the land, and in such other way and at such points as in the judgment of the Commissioners it is desirable that the boundary be so marked; and it is further agreed that the course of the entire boundary, as described in Article I of the Treaty of 1842 and as laid down as aforesaid under Article VI of that Treaty, shall be marked by said Commissioners upon quadruplicate sets of accurate modern charts prepared or adopted by them for that purpose, and that said charts so marked shall be certified and signed by them and two duplicate originals thereof shall be filed with each Government, and said Commissioners shall also prepare in duplicate and file with each Government a joint report or reports describing in detail the course of the boundary so marked by them, and the character and location of the several monuments and boundary marks and ranges marking it.

The line so defined and laid down shall be taken and deemed to be the international boundary as defined and laid down under Articles I and VI of the said Treaty of 1842.

ARTICLE IV

The Boundary from Its Intersection with the St. Lawrence River to the Mouth of Pigeon River

The High Contracting Parties agree that the existing International Waterways Commission, constituted by concurrent action of the United States and the Dominion of Canada and composed of three Commissioners on the part of the United States and three Commissioners on the part of the Dominion of Canada, is hereby authorized and empowered to ascertain and reestablish accurately the location of the international boundary line beginning at the point of its intersection with the St. Lawrence River near the forty-fifth parallel of north latitude, as determined under Articles I and VI of the Treaty of August 9, 1842, between the United States and Great Britain, and thence through the Great Lakes and communicating waterways to the mouth of Pigeon River, at the western shore of Lake Superior, in accordance with the description of such line in Article II of the Treaty of Peace between the United States and Great Britain, dated September 3, 1783, and of a portion of such line in Article II of the Treaty of August 9, 1842, aforesaid, and as described in the joint report dated June 18, 1822, of the Commissioners appointed under Article VI of the Treaty of December 24, 1814, between the United States and Great Britain, with respect to a portion of said line and as marked on charts prepared by them and filed with said report, and with respect to the remaining portion of said line as marked on the charts adopted as treaty charts of the boundary under the provisions of Article II of the Treaty of 1842, above mentioned, with such deviation from said line, however, as may be required on account of the cession by Great Britain to the United States of the portion of Horse Shoe Reef in the Niagara River necessary for the light-house erected there by the United States in accordance with the terms of the protocol of a conference held at the British Foreign Office December 9, 1850, between the representatives of the two Governments and signed by them agreeing upon such cession; and it is agreed that wherever the boundary is shown on said charts by a curved line along the water the Commissioners are authorized in their discretion to adopt, in place of such curved line, a series of connecting straight lines defined by distances and courses and following generally the course of such curved line, but conforming strictly to the description of the boundary in the existing treaty provisions, and the geographical coordinates of the turning points of such line shall be stated by said Commissioners so as to conform to the system of latitudes and longitudes of the charts mentioned below, and the said Commissioners shall so far as practicable mark the course of the entire boundary line located and defined as aforesaid, by buoys and monuments in the waterways and by permanent range marks established on the adjacent shores or islands, and by such other boundary marks and at such points as in the judgment of the Commissioners it is desirable that the boundary should be so marked; and the line of the boundary defined and located as aforesaid shall be laid down by said Commissioners on accurate modern charts prepared or adopted by them for that purpose, in quadruplicate sets, certified and signed by the Commissioners, two duplicate originals of which shall be filed by them with each Government; and the Commissioners shall also prepare in duplicate and file with each Government a joint report or reports describing in detail the course of said line and the range marks and buoys marking it, and the character and location of each boundary mark. The majority of the Commissioners shall have power to render a decision.

The line so defined and laid down shall be taken and deemed to be the international boundary as defined and established by treaty provisions and the proceedings thereunder as aforesaid from its intersection with the St. Lawrence River to the mouth of Pigeon River.

ARTICLE V

The Boundary from the Mouth of Pigeon River to the Northwesternmost Point of the Lake of the Woods

In order to complete and perfect the demarcation of the international boundary line between the United States and the Dominion of Canada from the mouth of Pigeon River, at the western shore of Lake Superior, to the northwesternmost point of the Lake of the Woods, which boundary is defined in Article II of the Treaty of Peace between the United States and Great Britain dated September 3, 1783, and in Article II of the Treaty of August 9, 1842, between the United States and Great Britain, wherein is defined also the location of the said northwesternmost point of the Lake of the Woods, and the greater part of the said boundary is marked on charts covering that section of the boundary adopted as treaty charts of the boundary under the provisions of Article II of the Treaty of 1842 aforesaid, but has never been actually located or monumented along its course by joint action of the two Governments, and no joint survey of its course has been made since the survey under the direction of the Commissioners appointed under Article VII of the Treaty of December 24, 1814, between the United States and Great Britain, under whose direction the charts above mentioned were prepared,

It is agreed that each of the High Contracting Parties shall appoint, without delay, an expert geographer or surveyor as Commissioners, who shall reestablish and fix the actual location of said entire boundary described and charted as aforesaid, and designate the side of the boundary upon which each island adjacent to the boundary belongs, it being mutually understood that the boundary, so far as practicable, shall be a water line and shall not intersect islands lying along its course, and the Commissioners shall so far as practicable mark such boundary along its course by monuments and buoys and range marks, and such other boundary marks as the Commissioners may determine, and at such points as in their judgment it is desirable that the boundary shall be so marked; and it is further agreed that the course of the entire boundary as described and laid down as aforesaid and as monumented by said Commissioners shall be marked by them upon quadruplicate sets of accurate modern charts prepared or adopted by them for that purpose, and that said charts so marked shall be certified and signed by them and two duplicate originals thereof shall be filed with each Government, and said Commissioners shall also prepare in duplicate and file with each Government a joint report or reports describing in detail the course of the boundary so marked by them and the character and location of the several monuments and boundary marks and ranges marking it.

The line so defined and laid down shall be taken and deemed to be the international boundary as defined and established under the aforesaid treaties from the mouth of Pigeon River to the northwesternmost point of the Lake of the Woods.

ARTICLE VI

The Boundary from the Northwesternmost Point of the Lake of the Woods to the Summit of the Rocky Mountains

In order to complete and render thoroughly effective the demarcation of the international boundary between the United States and the Dominion of Canada from the northwesternmost point of the Lake of the Woods to the summit of the Rocky Mountains, which boundary, according to existing treaties, runs due south from said northwesternmost point to the forty-ninth parallel of north latitude and thence along that parallel to the summit of the Rocky Mountains, and has been surveyed and charted and monumented as appears from the series of twenty-four sectional maps covering this portion of the boundary prepared and filed by the Joint Commission appointed for that purpose by joint action of the two Governments in 1872,

It is agreed that each of the High Contracting Parties shall appoint, without delay, an expert geographer or surveyor as a Commissioner, and under the joint direction of such Commissioners lost or damaged monuments along the course of said boundary shall be relocated and repaired and addi-

tional monuments and boundary marks shall be established wherever necessary, in the judgment of the Commissioners, to meet the requirements of modern conditions and to render more effective the demarcation of the existent boundary established under the treaty provisions and proceedings thereunder as aforesaid; and it is further agreed that in carrying out these provisions the said Commissioners shall observe the agreement stated in the protocol of the final meeting, dated May 29, 1876, of the Joint Commission aforesaid, which is as follows:

"2. In the intervals between the monuments along the parallel of latitude, it is agreed that the line has the curvature of a parallel of 49° north latitude; and that such characteristic shall determine all questions that may hereafter arise with reference to the position of the boundary at any point between neighboring monuments.

"3. It is further agreed that, in the event of any of the said three hundred and eighty-eight monuments or marks being obliterated beyond the power of recognition, the lost site or sites shall be recovered by their recorded position relatively to the next neighboring unobliterated mark or marks."

It is further agreed that the said Commissioners shall mark upon quadruplicate sets of accurate modern charts prepared or adopted by them for that purpose the entire course of said boundary and the location of the boundary monuments and marks established along the course of said boundary, and two duplicate originals thereof shall be filed with each Government, and said Commissioners shall also prepare in duplicate and file with each Government a joint report describing in detail the work done by them in replacing and repairing lost or damaged monuments and the character and location of the several monuments and boundary marks placed by them along said boundary.

The line so laid down and defined shall be taken and deemed to be the international boundary as defined and established by treaty provisions and the proceedings thereunder as aforesaid from the

northwesternmost point of the Lake of the Woods to the summit of the Rocky Mountains.

ARTICLE VII

The Boundary from the Summit of the Rocky Mountains to the Gulf of Georgia

Whereas, by concurrent action of the Government of the United States and the Government of Great Britain in 1902 and 1903, Commissioners were designated to act jointly for the purpose of renewing lost or damaged monuments and placing additional monuments where such were needed throughout the course of the boundary along the forty-ninth parallel of north latitude, from the summit of the Rocky Mountains westward to the eastern shore of the Gulf of Georgia, as defined in Article I of the Treaty of June 15, 1846, between the United States and Great Britain and as marked by monuments along its course and laid down on a series of charts, seven in number, by a Joint Commission organized in 1858 for that purpose and composed of two Commissioners appointed one by each Government, which charts, duly certified and authenticated in duplicate by said Commissioners, were approved and adopted by the two Governments, as appears from the declaration in writing to that effect signed on February 24, 1870, at Washington by duly authorized Plenipotentiaries of the respective Governments, and it appearing that the remonumenting of this line by the Commissioners first above referred to is now approaching completion;

It is hereby agreed by the High Contracting Parties that when such work is completed the entire course of said boundary, showing the location of the boundary monuments and marks established along the course of the boundary, shall be marked upon quadruplicate sets of accurate modern charts prepared or adopted for that purpose, and the said Commissioners, or their successors, are hereby authorized and required to so mark the line and designate the monuments on such charts, two duplicate originals of which shall be filed with each Government, and the said Commissioners, or their successors, shall also prepare in duplicate and file with each Government a joint report describing in detail the work done by them in replacing and repairing lost or damaged monuments and the character and location of the several monuments and boundary marks placed by them along said boundary.

The line so laid down and defined shall be taken and deemed to be the international boundary as defined and established by treaty provisions and the proceedings thereunder as aforesaid, from the summit of the Rocky Mountains to the eastern shore of the Gulf of Georgia.

ARTICLE VIII

THE BOUNDARY FROM THE FORTY-NINTH PARALLEL TO THE PACIFIC OCEAN

The High Contracting Parties agree that each shall appoint, without delay, an expert geographer or surveyor to serve as Commissioners for the purpose of delineating upon accurate modern charts, prepared or adopted by them for that purpose, the international boundary line between the United States and the Dominion of Canada from the forty-ninth parallel of north latitude along the middle of the channel which separates Vancouver's Island from the mainland and the middle of the Haro Channel and of Fuca's Straits to the Pacific Ocean, as defined in Article I of the Treaty of June 15, 1846, between the United States and Great Britain, and as determined by the award made on October 21, 1872, by the Emperor of Germany as arbitrator pursuant to the provisions of Articles XXXIV-XLII of the Treaty of May 8, 1871, between the United States and Great Britain, and as traced out and marked on a quadruplicate set of charts prepared for that purpose and agreed upon and signed by the duly authorized representatives of the respective Governments, as appears from the protocol of a conference at Washington on March 10, 1873, between such representatives which was signed by them on that date, and as defined by them in a written definition of said boundary signed by them and referred to in and attached to said protocol, and it is agreed that the said Commissioners shall adopt in place of the curved line passing between Saturna Island and Patos Island as shown on said charts a straight line running approximately north and south through a point midway between the eastern point of Saturna Island and the western point of Patos Island and intersecting the prolongations of the two straight lines of the boundary now joined by a curved line. The entire line thus laid down shall consist of a series of connecting straight lines defined by distances and courses; and the Commissioners are authorized to select and establish such reference marks on shore as they may deem necessary for the proper definition and location on the water of the boundary aforesaid. A quadruplicate set of such charts, showing the lines so laid down and marked by them and the location of the several marks or monuments selected or established by them along its course, shall be signed by them and two duplicate originals thereof shall be filed by them with each Government, and the Commissioners shall also prepare in duplicate and file with each Government a joint report, or reports, describing in detail the course of said line and the boundary marks and their location along its course.

The line so defined and laid down shall be taken and deemed to be the international boundary, as defined and established by treaty provisions and the proceedings thereunder as aforesaid, from the forty-ninth parallel of north latitude along the middle of the channel which separates Vancouver's Island from the mainland and the middle of Haro Channel and of Fuca's Straits to the Pacific Ocean.

ARTICLE IX

General Provisions

The Commissioners appointed under the provisions of this Treaty shall proceed without aclay to perform the duties assigned to them, but each Commissioner shall, before entering upon his duties, make oath in writing that he will impartially and faithfully perform his duties as such Commissioner.

In case a vacancy occurs in any of the Commissions constituted by this Treaty, by reason of the death, resignation, or other disability of a Commissioner, before the work of such Commission is completed, the vacancy so caused shall be filled forthwith by the appointment of another Commissioner by the party on whose side the vacancy occurs, and the Commissioner so appointed shall have the same powers and be subject to the same duties and obligations as the Commissioner originally appointed.

If a dispute or difference should arise about the location or demarcation of any portion of the boundary covered by the provisions of this Treaty and an agreement with respect thereto is not reached by the Commissioners charged herein with locating and marking such portion of the line, they shall make a report in writing jointly to both Governments, or severally each to his own Government, setting out fully the questions in dispute and the differences between them, but such Commissioners shall, nevertheless, proceed to carry on and complete as far as possible the work herein assigned to them with respect to the remaining portions of the line.

In case of such a disagreement between the Commissioners, the two Governments shall endeavor to agree upon an adjustment of the questions in dispute, and if an agreement is reached between the two Governments it shall be reduced to writing in the form of a protocol, and shall be communicated to the said Commissioners, who shall proceed to lay down and mark the boundary in accordance therewith, and as herein provided, but without prejudice to the special provisions contained in Articles I and II regarding arbitration.

It is understood that under the foregoing articles the same persons will be appointed to carry out the delimitation of boundaries in the several sections aforesaid, other than the section covered by Article IV, unless either of the Contracting Powers finds it expedient for some reason which it may think sufficient to appoint some other person to be Commissioner for any one of the above-mentioned sections.

Each Government shall pay the expenses of its own Commissioners and their assistants, and the cost of marking and monumenting the boundary shall be paid in equal moieties by the two Governments.

ARTICLE X

This Treaty shall be ratified by the President of the United States, by and with the advice and consent of the Senate thereof, and by His Britannic Majesty; and the ratifications shall be exchanged in Washington as soon as practicable.

In faith whereof the respective Plenipotentiaries have signed this Treaty in duplicate and have hereunto affixed their seals.

Done at Washington the 11th day of April in the year of our Lord one thousand nine hundred and eight.

ELIHU ROOT [SEAL.]
JAMES BRYCE [SEAL.]

TREATY BETWEEN THE UNITED STATES OF AMERICA AND HIS BRITANNIC MAJESTY, IN RESPECT OF THE DOMINION OF CANADA, TO DEFINE MORE ACCURATELY AT CERTAIN POINTS AND TO COMPLETE THE INTERNATIONAL BOUNDARY BETWEEN THE UNITED STATES AND CANADA AND TO MAINTAIN THE DEMARCATION OF THAT BOUNDARY

Signed at Washington, February 24, 1925

(Ratifications exchanged at Washington, July 17, 1925)

The United States of America and His Majesty the King of the United Kingdom of Great Britain and Ireland and of the British Dominions beyond the Seas, Emperor of India, in respect of the Dominion of Canada, desiring to define more accurately at certain points and to complete the International Boundary between the United States and Canada and to maintain the demarcation of that boundary, have resolved to conclude a treaty for these purposes, and to that end have appointed as their respective Plenipotentiaries:

The President of the United States of America: Charles Evans Hughes, Secretary of State

of the United States; and

His Britannic Majesty, in respect of the Dominion of Canada: The Honorable Ernest Lapointe, K. C., a member of His Majesty's Privy Council for Canada and Minister of Justice in the Government of that Dominion;

Who, after having communicated to each other their respective full powers, which were found to be in due and proper form, have agreed to and concluded the following articles:

ARTICLE I

Whereas Article V of the Treaty concerning the boundary between the United States and the Dominion of Canada concluded on April 11, 1908, between the United States and Great Britain, provided for the survey and demarcation of the International Boundary Line between the United States and the Dominion of Canada from the mouth of Pigeon River, at the western shore of Lake Superior, to the Northwesternmost Point of Lake of the Woods, as defined by the Treaties concluded between the United States and Great Britain on September 3, 1783, and August 9, 1842;

And whereas Article VI of the said Treaty concluded on April 11, 1908, provided for the relocation and repair of lost or damaged monuments and for the establishment of additional monuments and boundary marks along the course of the International Boundary between the United States and the Dominion of Canada from the Northwesternmost Point of Lake of the Woods to the summit of the Rocky Mountains, as established under existing treaties and surveyed, charted, and monumented by the Joint Commission appointed for that purpose by joint action of the Contracting Parties in 1872;

And whereas it has been found by surveys executed under the direction of the Commissioners appointed pursuant to the said Treaty of April 11, 1908, that the boundary line between the United States and the Dominion of Canada from the mouth of Pigeon River, at the western shore of Lake Superior, to the Northwesternmost Point of Lake of the Woods as defined by the Treaties concluded on September 3, 1783, and August 9, 1842, is intersected by the boundary from the Northwesternmost Point of Lake of the Woods to the summit of the Rocky Mountains as established under existing treaties and surveyed, charted, and monumented by the Joint Commission appointed for that purpose in 1872, at five points in Lake of the Woods adjacent to and directly south of the said Northwesternmost

Point, and that there are two small areas of United States waters in Lake of the Woods, comprising a total area of two and one-half acres, entirely surrounded by Canadian waters;

And whereas no permanent monuments were ever erected on these boundary lines north of the

most southerly of these points of intersection;

The Contracting Parties, in order to provide for a more practical definition of the boundary between the United States and the Dominion of Canada in Lake of the Woods, hereby agree that this most southerly point of intersection, being in latitude 49°23'04''.49 north, and longitude 95°09'11''.61 west,¹ shall be the terminus of the boundary line heretofore referred to as the International Boundary Line between the United States and the Dominion of Canada from the mouth of Pigeon River, at the western shore of Lake Superior, to the Northwesternmost Point of Lake of the Woods and the initial point of the boundary line heretofore referred to as the International Boundary between the United States and the Dominion of Canada from the Northwesternmost Point of Lake of the Woods to the summit of the Rocky Mountains, in lieu of the said Northwesternmost Point.

The aforesaid most southerly point shall be located and monumented by the Commissioners appointed under the said Treaty of April 11, 1908, and shall be marked by them on the chart or charts prepared in accordance with the provisions of Articles V and VI of the said Treaty, and a detailed account of the work done by the Commissioners in locating said point, together with a description of the character and location of the several monuments erected, shall be included in the report or

reports prepared pursuant to the said Articles.

The point so defined and monumented shall be taken and deemed to be the terminus of the boundary line heretofore referred to as the International Boundary Line between the United States and the Dominion of Canada, from the mouth of Pigeon River, at the western shore of Lake Superior, to the Northwesternmost Point of Lake of the Woods and the initial point of the boundary line heretofore referred to as the International Boundary between the United States and the Dominion of Canada from the Northwesternmost Point of Lake of the Woods to the summit of the Rocky Mountains.

ARTICLE II

Whereas Article VI of the Treaty concerning the boundary between the United States and the Dominion of Canada concluded on April 11, 1908, between the United States and Great Britain, provided for the relocation and repair of lost or damaged monuments and for the establishment of additional monuments and boundary marks along the courses of the International Boundary between the United States and the Dominion of Canada from the Northwesternmost Point of Lake of the Woods south to the 49th parallel of north latitude and thence westward along said parallel of latitude to the summit of the Rocky Mountains, as established under existing treaties and surveyed, charted, and monumented by the Joint Commission appointed for that purpose by joint action of the Contracting Parties in 1872;

And whereas Article VI of the said Treaty concluded on April 11, 1908, further provides that in carrying out the provisions of that Article the agreement stated in the protocol of the final meeting of the said Joint Commission, dated May 29, 1876, should be observed, by which protocol it was agreed that in the intervals between the monuments along the 49th parallel of north latitude the boundary line has the curvature of a parallel of 49° north latitude;

And whereas the Commissioners appointed and acting under the provisions of Article VI of the said Treaty of 1908 have marked the boundary line wherever necessary in the intervals between the original monuments established by the said Joint Commission, appointed in 1872, in accordance with the agreement stated in the protocol of the final meeting, dated May 29, 1876, of the Joint Com-

¹ The geographic coordinates, latitude 49°23′04′′.49, longitude 95°09′11′′.61, used by the two Governments in defining the location of this point in the treaty of 1925, were obtained from an adjustment made in 1919 of triangulation executed by the International Boundary Commission, and are derived from the geographic positions of triangulation stations "States" and "Canada" as published in Appendix IV of the U. S. Coast and Geodetic Survey Report for 1911. The geographic position of this same point in terms of the North American datum of 1927, the datum on which all geographic positions of this section of the boundary line are based, is latitude 49°23′04′′.14, longitude 95°09′11′′.34.

mission aforesaid, and as set forth in Article VI of the Treaty of 1908, by placing intermediate monuments on lines joining the original monuments, which have in each case the curvature of a parallel of 49° north latitude;

And whereas the average distance between adjacent monuments as thus established or reestablished along the 49th parallel of north latitude from Lake of the Woods to the summit of the Rocky Mountains by the Commissioners acting under Article VI of the Treaty of 1908 is one and one-third miles and therefore the deviation of the curve of the 49th parallel from a straight or right line joining adjacent monuments is, for this average distance between monuments, only one-third of a foot, and in no case does the actual deviation exceed one and eight-tenths feet;

And whereas it is impracticable to determine the course of a line having the curvature of a parallel of 49° north latitude on the ground between the adjacent monuments which have been established or reestablished by the Commissioners and the demarcation of the boundary would be more thoroughly effective if the line between adjacent monuments be defined as a straight or right line;

And whereas it is desirable that the boundary at any point between adjacent monuments may be conveniently ascertainable on the ground, the Contracting Parties, in order to complete and render thoroughly effective the demarcation of the boundary between the United States and the Dominion of Canada from the Northwesternmost Point of Lake of the Woods to the summit of the Rocky Mountains, hereby agree that the line heretofore referred to as the International Boundary between the United States and the Dominion of Canada from the Northwesternmost Point of Lake of the Woods to the summit of the Rocky Mountains shall be defined as consisting of a series of right or straight lines joining adjacent monuments as now established or reestablished and as now laid down on charts by the Commissioners acting under Article VI of the Treaty of 1908, in lieu of the definition set forth in the agreement of the aforesaid Joint Commissioners, dated May 29, 1876, and quoted in Article VI of the said Treaty of 1908, that in the intervals between the monuments the line has the curvature of the parallel of 49° north latitude.

ARTICLE III

Whereas the Treaty concluded on May 21, 1910, between the United States and Great Britain, defined the International Boundary Line between the United States and the Dominion of Canada, from a point in Passamaquoddy Bay lying between Treat Island and Friar Head to the middle of Grand Manan Channel and provided that the location of the line so defined should be laid down and marked by the Commissioners appointed under the Treaty of April 11, 1908;

And whereas it has been found by the surveys executed pursuant to the said Treaty of May 21, 1910, that the terminus of the boundary line defined by said Treaty at the middle of Grand Manan Channel is less than three nautical miles distant both from the shore line of Grand Manan Island in the Dominion of Canada and from the shore line of the State of Maine in the United States, and that there is a small zone of waters of controvertible jurisdiction in Grand Manan Channel between said terminus and the High Seas;

The Contracting Parties, in order completely to define the boundary line between the United States and the Dominion of Canada in the Grand Manan Channel, hereby agree that an additional course shall be extended from the terminus of the boundary line defined by the said Treaty of May 21, 1910, south 34°42′ west, for a distance of two thousand three hundred eighty-three (2,383) meters, through the middle of Grand Manan Channel, to the High Seas.

The course so defined shall be located and marked by the Commissioners appointed under the Treaty of April 11, 1908, and shall be laid down by them on the chart or charts adopted in accordance with the provisions of Article I of the said Treaty, and a detailed account of the work done by the Commissioners in locating and marking said line, together with a description of the several monuments erected, shall be included in the report or reports prepared pursuant to Article I of the Treaty of April 11, 1908.

The course so defined and laid down shall be taken and deemed to be the boundary line between the United States and the Dominion of Canada in Grand Manan Channel from the terminus of the boundary line as defined by the Treaty of May 21, 1910, to the High Seas.

ARTICLE IV

Whereas, pursuant to existing treaties between the United States and Great Britain, a survey and effective demarcation of the boundary line between the United States and the Dominion of Canada through the Great Lakes and the St. Lawrence River and through the Straits of Georgia, Haro, and Juan de Fuca from the 49th Parallel to the Pacific Ocean and between Alaska and the Dominion of Canada from the Arctic Ocean to Mount St. Elias have been made and the signed joint maps and reports in respect thereto have been filed with the two Governments;

And whereas a survey and effective demarcation of the boundary line between the United States and the Dominion of Canada from the Gulf of Georgia to Lake Superior and from the St. Lawrence River to the Atlantic Ocean and between Alaska and the Dominion of Canada from Mount St. Elias to Cape Muzon are nearing completion;

And whereas boundary monuments deteriorate and at times are destroyed or damaged; and boundary vistas become closed by the growth of timber;

And whereas changing conditions require from time to time that the boundary be marked more precisely and plainly by the establishment of additional monuments or the relocation of existing monuments;

The Contracting Parties, in order to provide for the maintenance of an effective boundary line between the United States and the Dominion of Canada and between Alaska and the Dominion of Canada, as established or to be established, and for the determination of the location of any point thereof, which may become necessary in the settlement of any question that may arise between the two Governments hereby agree that the Commissioners appointed under the provisions of the Treaty of April 11, 1908, are hereby jointly empowered and directed: to inspect the various sections of the boundary line between the United States and the Dominion of Canada and between Alaska and the Dominion of Canada at such times as they shall deem necessary; to repair all damaged monuments and buoys; to relocate and rebuild monuments which have been destroyed; to keep the boundary vistas open; to move boundary monuments to new sites and establish such additional monuments and buoys as they shall deem desirable; to maintain at all times an effective boundary line between the United States and the Dominion of Canada and between Alaska and the Dominion of Canada, as defined by the present Treaty and Treaties heretofore concluded, or hereafter to be concluded; and to determine the location of any point of the boundary line which may become necessary in the settlement of any question that may arise between the two Governments.

The said Commissioners shall submit to their respective Governments from time to time, at least once in every calendar year, a joint report containing a statement of the inspections made, the monuments and buoys repaired, relocated, rebuilt, moved, and established, and the mileage and location of vistas opened, and shall submit with their reports, plats and tables certified and signed by the Commissioners, giving the locations and geodetic positions of all monuments moved and all additional monuments established within the year, and such other information as may be necessary to keep the boundary maps and records accurately revised.

After the completion of the survey and demarcation of the boundary line between the United States and the Dominion of Canada from the Gulf of Georgia to Lake Superior and from the St. Lawrence River to the Atlantic Ocean, as provided for by the Treaty of April 11, 1908, the Commissioners appointed under the provisions of that Treaty shall continue to carry out the provisions of this Article, and, upon the death, resignation, or other disability of either of them, the Party on whose side the vacancy occurs shall appoint an Expert Geographer or Surveyor as Commissioner, who shall have the same powers and duties in respect to carrying out the provisions of this Article, as are conferred by this Article upon the Commissioner appointed under the provisions of the said Treaty of 1908.

The Contracting Parties further agree that each Government shall pay the salaries and expenses of its own Commissioner and his assistants, and that the expenses jointly incurred

by the Commissioners in maintaining the demarcation of the boundary line in accordance with the provisions of this Article shall be borne equally by the two Governments.

ARTICLE V

This Treaty shall be ratified by the Contracting Parties and the ratifications shall be exchanged in Washington or Ottawa as soon as practicable. The Treaty shall take effect on the date of the exchange of ratifications.

Upon the expiration of six years from the date of the exchange of ratifications of the present Treaty, or any time thereafter, Article IV may be terminated upon twelve months' written notice given by either Contracting Party to the other, and following such termination the Commissioners therein mentioned and their successors shall cease to perform the functions thereby prescribed.

In faith whereof, the respective Plenipotentiaries have signed this Treaty in duplicate and have hereunto affixed their seals.

Done at Washington the 24th day of February, A. D. 1925.

[SEAL]

CHARLES EVANS HUGHES.

[SEAL]

APPOINTMENTS OF THE COMMISSIONERS UNDER CONCURRENT ACTION OF 1902–1903 AND UNDER THE TREATY OF 1908

Dr. W. F. King for His Britannic Majesty

P. C. 1098-L

CERTIFIED COPY OF A REPORT OF A COMMITTEE OF THE HONOURABLE THE PRIVY COUNCIL, APPROVED BY HIS EXCELLENCY ON THE 4TH JUNE, 1902

The Committee of the Privy Council have had under consideration a despatch dated 7th April, 1902, from His Majesty's Ambassador to the United States transmitting copy of a note from the Secretary of State of the United States, relative to the demarcation of the boundary between the Dominion of Canada and the United States from Lake Superior to the Pacific Ocean.

The Minister of the Interior, to whom the said despatch was referred, observes that the opinion stated by the Secretary of State of the United States, as based on the reports of their officers charged last year with the duty of examining into the condition of the original monuments along the 49th parallel West of the Rocky Mountains, that these monuments are still in such a satisfactory condition that their locations are readily recoverable, is fully in accord with the results of the examinations and surveys made last year by Messrs. McArthur and O'Hara, surveyors employed by the Minister of the Interior to make a concurrent examination with the United States Officers aforesaid.

The Secretary of State, further, is of opinion that this condition of the frontier marks renders it unnecessary to resort to a new convention for the establishment of that part of the boundary, and that all that remains to be done in order to render the marking thoroughly effective for the requirements of the present time and of the future is merely the replacement of the old monuments by more permanent ones, and the interpolation of intermediate monuments at convenient points along the existing established boundary. He accordingly suggests the appointment by His Majesty's Government of one or more officers to carry out the necessary restoration of old and establishment of new monuments in concert with the officers designated by the United States Government for that purpose; namely, the Superintendent of the United States Geological Survey.

The Minister further observes with reference to this, that the proposed renovation and completion of the work of the Boundary Commission of 1856–1869, is fully in line with, though in advance of the suggestion made by His Excellency's advisers in their Minute of 5th January, 1901, which particularly referred to the renewed marking at three specified localities merely, and is further very desirable in the best interests of both Countries.

The Minister, further, recommends that Mr. W. F. King, the Chief Astronomer of the Department of the Interior, who is conversant with the subject and has had the direction on the part of Canada' of the surveys and examinations which were made last year and are being continued this year along the line, be nominated as a suitable person to represent His Majesty's Government in arranging the necessary details and carrying out the work in concert with the officers named by the United States Government.

The Committee advise that His Excellency be moved to communicate the substance of this Minute to the Right Honourable His Majesty's Secretary of State for the Colonies.

All which is respectfully submitted for His Excellency's approval.

JOHN J. McGee, Clerk of the Privy Council.

The Honourable

THE MINISTER OF THE INTERIOR.

Messrs. O. H. Tittmann and Charles D. Walcott for the United States

JOHN HAY, SECRETARY OF STATE FOR THE UNITED STATES

DEPARTMENT OF STATE, Washington, June 9, 1903.

Messrs. O. H. TITTMANN,

Superintendent, Coast and Geodetic Survey,

and

CHARLES D. WALCOTT,

Director, Geological Survey.

Gentlemen: You are hereby authorized to sign as United States Commissioners in all matters relating to the work of marking and mapping that portion of the 49th parallel between the summit of the Rocky Mountains and Point Roberts, as provided for in the Sundry Civil Appropriation Act, approved March 3, 1903, including the signature with the British Commissioner of the final report and maps.

I am, Gentlemen, Your obedient servant,

JOHN HAY.

Mr. O. H. TITTMANN FOR THE UNITED STATES

THEODORE ROOSEVELT, PRESIDENT OF THE UNITED STATES OF AMERICA

To all to whom these Presents shall come, Greeting:

Know Ye, that reposing special trust and confidence in the integrity and ability of Otto H. Tittmann, of Missouri, Superintendent of the United States Coast and Geodetic Survey, I do appoint him the expert Commissioner on the part of the United States for the purpose of more accurately defining and marking the International Boundary Line between the United States and the Dominion of Canada, under the provisions of Articles I, II, III, V, VI, VII, and VIII of the treaty between the United States and Great Britain, signed at Washington on April 11, 1908, and do authorize and empower him to execute and fulfill the duties of this commission with all the powers, privileges, and emoluments thereunto of right appertaining, during the pleasure of the President of the United States.

In testimony whereof, I have caused the Seal of the United States to be hereunto affixed. Given under my hand at the City of Washington this fifth day of June, in the year of our Lord one thousand nine hundred and eight, and of the Independence of the United States of America the one hundred and thirty-second.

THEODORE ROOSEVELT.

[SEAL]

By the President:

ELIHU ROOT, Secretary of State.

Dr. W. F. King for His Britannic Majesty

P. C. 2181-M

CERTIFIED COPY OF A REPORT OF THE COMMITTEE OF THE PRIVY COUNCIL, APPROVED BY HIS EXCELLENCY THE GOVERNOR GENERAL ON THE 27TH JUNE, 1908

The Committee of the Privy Council have had under consideration a despatch, dated 10th June, 1908, from His Majesty's Ambassador to the United States, containing the information that the ratifications of the Treaty for the Delimitation of the International Boundary between the United States and Canada were exchanged on the 4th June, 1908.

The Minister of the Interior, to whom the despatch was referred, observes that the Treaty, for the purpose of the more complete definition and demarcation which it contemplates, divides the boundary line, from the Atlantic Ocean at the entrance to Passamaquoddy Bay, to the Pacific Ocean at the Strait of Fuca, into eight sections, and provides that for each section, with the exception of the fourth section, which includes the line through the St. Lawrence River and the Great Lakes, and which is to be dealt with by the existing International Waterways Commission, two expert geographers or surveyors shall be appointed, one by each Government, as Commissioners to accurately define and mark the line, with the understanding stated in Article 9, that the same persons shall be appointed Commissioners under the several sections, excepting the fourth section, unless either Government find it expedient for some reason which it may think sufficient, to appoint some other person to be Commissioner for any of the sections.

The Minister, in accordance with the provisions above mentioned, recommends that Mr. William Frederick King, Dominion Topographical Surveyor, and Chief Astronomer of the Department of the Interior, be nominated for the position of His Majesty's Commissioner for

all the sections of the line except the fourth.

The Committee concurring advise that your Excellency may be pleased to inform his Majesty's Secretary of State for the Colonies of the desire of your Excellency's Government in this regard.

All which is respectfully submitted for approval.

RODOLPHE BOUDREAU, Clerk of the Privy Council.

The Honourable

THE MINISTER OF THE INTERIOR.

MR. E. C. BARNARD FOR THE UNITED STATES

WOODROW WILSON, PRESIDENT OF THE UNITED STATES OF AMERICA

To all to whom these Presents shall come, Greeting:

Know Ye, that reposing special trust and confidence in the Integrity and Ability of Edward C. Barnard, of New York, I do appoint him the expert Commissioner on the part of the United States for the purpose of more accurately defining and marking the International Boundary Line between the United States and the Dominion of Canada, under the provisions of Articles I, II, III, V, VI, VII, and VIII of the treaty between the United States and Great Britain, signed at Washington on April 11, 1908, and do authorize and empower him to execute and fulfill the duties of this commission with all the powers, privileges and emoluments thereunto of right appertaining, during the pleasure of the President of the United States.

In testimony whereof, I have caused the Seal of the United States to be hereunto affixed. Given under my hand at the City of Washington this thirtieth day of April, in the year of our Lord one thousand nine hundred and fifteen, and of the Independence

of the United States of America the one hundred and thirty-ninth.

SEAL

WOODROW WILSON.

By the President:

W. J. BRYAN, Secretary of State.

Mr. J. J. McArthur for His Britannic Majesty

[SEAL] GEORGE R. I.

George by the Grace of God, of the United Kingdom of Great Britain and Ireland and of the British Dominions beyond the Seas, King, Defender of the Faith, Emperor of India, Etc., Etc.

To all and singular to whom these Presents shall come, Greeting!

Whereas by a Treaty concluded at Washington on the 11th day of April, 1908, between our Royal Predecessor His Majesty King Edward VII and our Good Friends the United States of America, respecting the Demarcation of the International Boundary between the United States and the Dominion of Canada, it was in effect provided that Commissioners should be appointed on Our part and on that of Our said Good Friends, and that the Commissioners so appointed should define and mark the boundary line, with the exception of that portion of it extending from the 45th parallel of north latitude through the St. Lawrence River, the Great Lakes and connecting waterways to the mouth of the Pigeon River;

Now Know Ye that We, reposing especial trust and confidence in the approved learning, wisdom and fidelity of Our Trusty and Well-beloved James Joseph McArthur, Esquire, Dominion Land Surveyor, have named and appointed, as We do by these Presents name and appoint him to be Our Commissioner for the purposes aforesaid and pursuant to the said Treaty, to meet the other Commissioner appointed or to be appointed in like manner by Our Good Friends the United States of America, to do and determine all such matters as are provided to be done by him under the said Treaty, in the manner therein provided.

In witness whereof We have signed these Presents with Our Royal Hand.

Given at Our Court of Saint James the Twenty-sixth day of February One thousand Nine Hundred and Seventeen in the Seventh year of Our Reign.

By His Majesty's Command:

ARTHUR JAMES BALFOUR.

Mr. E. Lester Jones for the United States

WOODROW WILSON, PRESIDENT OF THE UNITED STATES OF AMERICA

To all to whom these Presents shall come, Greeting:

Know Ye, that reposing special trust and confidence in the Integrity and Ability of E. Lester Jones, of Virginia, I do appoint him the expert Commissioner on the part of the United States for the purpose of more accurately defining and marking the International Boundary Line between the United States and the Dominion of Canada, under the provisions of Articles I, II, III, V, VI, VII, and VIII of the treaty between the United States and Great Britain, signed at Washington on April 11, 1908, and do authorize and empower him to execute and fulfill the duties of this commission with all the powers, privileges and emoluments thereunto of right appertaining, during the pleasure of the President of the United States.

In testimony whereof, I have caused the Seal of the United States to be hereunto affixed. Given under my hand, in the District of Columbia, this twenty-eighth day of February, in the year of our Lord one thousand nine hundred and twenty-one, and of the Independence of the United States of America the one hundred and forty-fifth.

[SEAL]

WOODROW WILSON.

By the President:

Bainbridge Colby, Secretary of State.

Mr. J. D. Craig for His Britannic Majesty

[SIGNET] (Sgd.) George R. I.

George, by the Grace of God, of the United Kingdom of Great Britain and Ireland and of the British Dominions beyond the Seas King, Defender of the Faith, Emperor of India, Etc., Etc., Etc.

To all and singular to whom these Presents shall come, Greeting!

Whereas by Article VI of a Convention concluded at Washington on the 24th day of January 1903 between Our Royal Predecessor His Majesty King Edward VII and Our Good Friends the United States of America, respecting the adjustment of the Boundary between the Dominion of Canada and the Territory of Alaska, it was in effect provided that Commissioners should be appointed on Our part and on that of Our said Good Friends, for the purpose of laying down the boundary line in conformity with the decision of the Tribunal constituted under the terms of Article I of the said Convention;

And whereas by a Treaty concluded at Washington on the 11th day of April 1908 between Our said Royal Predecessor and Our said Good Friends, respecting the Demarcation of the International Boundary between the United States and the Dominion of Canada, it was in effect provided that Commissioners should be appointed on Our part and on that of Our said Good Friends, to define and mark the boundary line, with the exception of that portion of it extending from the 45th parallel of north latitude through the Saint Lawrence River, the Great

Lakes and connecting waterways to the mouth of the Pigeon River;

Now know ye that We, reposing especial Trust and Confidence in the approved Learning, Wisdom and Fidelity of Our Trusty and Well-beloved John Davidson Craig, Esquire, Bachelor of Arts, Bachelor of Science, Member of the Engineering Institute of Canada, Dominion Land Surveyor and International Boundary Commission Engineer, have named and appointed, as We do by these Presents name and appoint him to be Our Commissioner for the purposes aforesaid and pursuant to the said Convention and Treaty, to meet the other Commissioners appointed or to be appointed in like manner by Our Good Friends the United States of America, and to do and determine all such matters as are provided to be done by him under the said Convention and Treaty, in the manner therein provided.

In witness whereof We have signed these Presents with Our Royal Hand.

Given at Our Court of Saint James the Seventh day of March in the Year of Our Lord One thousand Nine hundred and Twenty-Five and in the Fifteenth Year of Our Reign.

MR. JAMES H. VAN WAGENEN FOR THE UNITED STATES

HERBERT HOOVER, PRESIDENT OF THE UNITED STATES OF AMERICA

To all to whom these Presents shall come, Greeting:

Know Ye, That reposing special trust and confidence in the Integrity and Ability of James H. Van Wagenen, of Iowa, I do appoint him the expert Commissioner on the part of the United States for the purpose of more accurately defining and marking the International Boundary Line between the United States and the Dominion of Canada, under the provisions of Articles I, II, III, V, VI, VII and VIII of the treaty between the United States and Great Britain, signed at Washington on April 11, 1908, and Article IV of the treaty between the United States and Great Britain, signed at Washington on February 24, 1925, and do authorize and empower him to execute and fulfil the duties of this commission with all the powers, privileges and emoluments thereunto of right appertaining, during the pleasure of the President of the United States.

In testimony whereof, I have caused the Seal of the United States to be hereunto affixed.

Done at the City of Washington this third day of May, in the year of our Lord one thousand nine hundred and twenty-nine, and of the Independence of the United States of America the one hundred and fifty-third.

[SEAL]

HERBERT HOOVER.

By the President:

HENRY L. STIMSON, Secretary of State.

Mr. Noel J. Ogilvie for His Britannic Majesty

[SIGNET] (Sgd.) George R. I.

George, by the Grace of God, of Great Britain, Ireland and the British Dominions beyond the Seas King, Defender of the Faith, Emperor of India, Etc., Etc., Etc.

To all and singular to whom these Presents shall come, Greeting!

Whereas by Article VI of a Convention concluded at Washington on the 24th day of January 1903 between Our Royal Predecessor His Majesty King Edward VII and Our Good Friends the United States of America, respecting the adjustment of the Boundary between the Dominion of Canada and the Territory of Alaska, it was in effect provided that Commissioners should be appointed on Our part and on that of Our said Good Friends, for the purpose of laying down the boundary line in conformity with the decision of the Tribunal constituted under the terms of Article I of the said Convention:

And whereas by a Treaty concluded at Washington on the 11th day of April 1908 between Our said Royal Predecessor and Our said Good Friends, respecting the Demarcation of the International Boundary between the United States and the Dominion of Canada, it was in effect provided that Commissioners should be appointed on Our part and on that of Our said Good Friends, to define and mark the boundary line, with the exception of that portion of it extending from the 45th parallel of north latitude through the Saint Lawrence River, the Great Lakes and connecting waterways to the mouth of the Pigeon River;

Now know ye that We, reposing especial Trust and Confidence in the approved Learning, Wisdom and Fidelity of Our Trusty and Well-beloved Noel John Ogilvie, Esquire, Dominion Land Surveyor, Member of the Engineering Institute of Canada, Member of the American Society of Civil Engineers, the Director of the Geodetic Survey of Canada, have named and appointed, as We do by these Presents name and appoint him to be Our Commissioner for the purposes aforesaid and pursuant to the said Convention and Treaty, to meet the other Commissioners appointed or to be appointed in like manner by Our Good Friends the United States of America, and to do and determine all such matters as are provided to be done by him under the said Convention and Treaty, in the manner therein provided, this appointment to be effective as and from the 14th day of May of this year.

In witness whereof We have signed these Presents with Our Royal Hand.

Given at Our Court of Saint James the tenth day of June in the Year of Our Lord One Thousand Nine Hundred and Thirty-one and in the Twenty-second Year of Our Reign.

Mr. Thomas Riggs for the United States

FRANKLIN D. ROOSEVELT, PRESIDENT OF THE UNITED STATES OF AMERICA

To all to whom these Presents shall come, Greeting:

Know Ye, That reposing special trust and confidence in the Integrity and Ability of Thomas Riggs, of New York, I do appoint him the expert Commissioner on the part of the United States for the purpose of more accurately defining and marking the International Boundary Line between the United States and the Dominion of Canada, under the provisions of Articles I, II, III, V, VI, VII, and VIII of the treaty between the United States and Great Britain, signed at Washington on April 11, 1908, and Article IV of the treaty between the United States and Great Britain, signed at Washington on February 24, 1925, and do authorize and empower him to execute and fulfil the duties of this commission with all the powers, privileges and emoluments thereunto of right appertaining, during the pleasure of the President of the United States.

In testimony whereof, I have caused the Seal of the United States to be hereunto affixed.

Done at the City of Washington this first day of August, in the year of our Lord one thousand nine hundred and thirty-five, and of the Independence of the United States of America the one hundred and sixtieth.

[SEAL]

Franklin D Roosevelt

By the President:

WILLIAM PHILLIPS, Acting Secretary of State.

RESERVATION OF LANDS ALONG THE INTERNATIONAL BOUNDARY

PROCLAMATIONS BY THE PRESIDENT OF THE UNITED STATES OF AMERICA

(No. 810)

Whereas, the customs and immigration laws of the United States can be better enforced and the public welfare thereby better advanced when the Federal Government has complete control of the use and occupation of lands abutting on international boundary lines;

Now, therefore, I, Theodore Roosevelt, President of the United States, do hereby proclaim and make known that all unpatented public lands of the United States, lying within sixty feet of the boundary line between the United States and the Dominion of Canada, are hereby declared to be, and are set apart as a public reservation, and shall hereafter be subject only to such rights as have been heretofore legally acquired under settlements, entries, reservations, or other forms of appropriation, and are now existing, but shall not be subject at any time to any other claim, use, or occupation, except for public highways; and any patent issued for any legal subdivision affected by this reservation under any claim hereafter initiated, shall contain a recital that it is issued subject to this proclamation.

In witness whereof, I have hereunto set my hand and caused the seal of the United States to be affixed.

Done at the City of Washington this 15th day of June, in the year of our Lord one thousand nine hundred and eight, and of the Independence of the United States the one hundred and thirty-second.

[SEAL]

By the President:

ELIHU ROOT, Secretary of State.

THEODORE ROOSEVELT

(No. 1196)

Whereas, the customs and immigration laws of the United States can be better enforced and the public welfare thereby advanced by the retention in the Federal Government of complete control of the use and occupation of lands abutting on International Boundary Lines;

Now, therefore, I, William Howard Taft, President of the United States, do hereby declare, proclaim, and make known that there are hereby reserved from entry, settlement, or other form of appropriation and disposition under the public-land laws, and set apart as a public reservation, all public lands lying within sixty feet of the boundary line between the United States and the Dominion of Canada.

Excepting from the force and effect of this proclamation all lands which were prior to June fifteenth, nineteen hundred and eight, embraced in any legal entry or covered by any lawful filing, selection, or right of way duly of record in the proper United States land office or upon which any valid settlement had been made pursuant to law, the statutory period within which to make or complete entry or filing of record had not expired, and which has been or may be perfected as required by law. Any claims lawfully initiated between June fifteenth, nineteen hundred and eight, and the date hereof, lawfully maintained and perfected, may be patented subject to the reservation prescribed in proclamation of the President dated June fifteenth, nineteen hundred and eight.

In witness whereof, I have hereunto set my hand and caused the seal of the United States to be affixed.

Done at the city of Washington, this third day of May, in the year of our Lord one thousand nine hundred and twelve, and of the Independence of the United States the one hundred and thirty-sixth.

[SEAL]

WM. H. TAFT

By the President:

HUNTINGTON WILSON, Acting Secretary of State.

ACTION TAKEN BY THE PROVINCIAL GOVERNMENTS OF THE DOMINION OF CANADA RESERVATIONS BY THE PROVINCE OF BRITISH COLUMBIA

His Honour the Lieutenant-Governor of British Columbia, by and with the advice of his Executive Council, doth order as follows:

That all unalienated Crown lands within the Province of British Columbia lying within sixty feet of the 49th parallel of north latitude which is the boundary line between the United States of America and the Dominion of Canada; and also all unalienated Crown lands lying within sixty feet of the boundary line between the Province of British Columbia and Alaska, be reserved for Government purposes.

A. Campbell Reddie,

Deputy Clerk,

Executive Council.

APPROVED AND ORDERED
THIS 5TH DAY OF NOVEMBER,
A. D. 1908.
JAMES DUNSMUIR,

Lieutenant-Governor.

RESERVATIONS BY THE PROVINCE OF ALBERTA

In Alberta, while no legislation has as yet been passed making reservations of land along the boundary, the system of public land surveys provides for a road allowance 66 feet in width along and adjoining the boundary.

RESERVATIONS BY THE PROVINCE OF SASKATCHEWAN

The Provincial Lands Act of Saskatchewan of 1931, Section 6, provides as follows:

- (1) There is hereby reserved to the Crown out of every disposition of Provincial lands extending to the boundary line between Canada and the United States of America a strip of land one chain in width measured from such boundary line, and no buildings or works shall be erected or executed on such land.
- (2) Notwithstanding subsection (1) the Crown may permit the occupation of or otherwise dispose of any such reserved strip of land or any part thereof for the purposes of the construction of railways, waterways, wharves, bridges, canals, ditches, or other works of public character, upon such terms and conditions as the Lieutenant Governor in Council may in each case prescribe.

RESERVATIONS BY THE PROVINCE OF MANITOBA

In 1930 the Provincial Legislature of Manitoba enacted "The Provincial Lands Act", being chapter 32 of the Statutes of that year, and in section 6, subsections (1) and (2) provided as follows:

- 6. (1) There is hereby reserved to the Crown out of every disposition of Provincial lands extending to the sea or any inlet thereof or to the boundary line between Canada and the United States of America or between the Province of Manitoba and the Provinces of Ontario or Saskatchewan, or the Northwest Territories, respectively, whether under this or any other Act of this Legislature, a strip of land one and one-half chains in width measured from high water mark or such boundary line, as the case may be, and no buildings or works shall be erected or executed on such land.
- (2) Notwithstanding subsection (1) hereof the Crown may permit the occupation of or otherwise dispose of any such reserved strip of land or any part thereof for the purposes of the construction of railways, waterways, wharves, docks, shipyards, bridges, canals, ditches, or other works of a public character, upon such terms and conditions as the Lieutenant-Governor-in-Council may in each case prescribe.

This Act was repealed in 1934 by "The Crown Lands Act", being chapter 7 of the Statutes of that year, and in section 5 thereof it is provided as follows:

- 5. In the absence of express provision to the contrary therein, there is reserved to the Crown out of every disposition of Crown land,
 - (a) in case the land extends—
 - (i) to the sea or an inlet thereof; or
 - (ii) to the shores of any navigable water or an inlet thereof; or
 - (iii) to the boundary line between Canada and the United States of America, or between the Province and the Provinces of Ontario or Saskatchewan, or the Northwest Territories;

a strip of land one and one-half chains in width, measured from ordinary high-water mark or from the boundary line, as the case is;

- (b) where the land borders a body of navigable water, the public right of landing from and mooring boats and vessels so far as is reasonably necessary;
- (c) where the land borders a body of water,
 - (i) the bed of the body of water below ordinary high-water mark; and
 - (ii) the public right of passage over a portage road or trail in existence at the date of the disposition;
- (d) mines and minerals, together with the right to enter, locate, prospect, mine for, and remove minerals;
- (e) the right to and to use land necessary for the protection or development of adjacent water power; and
- (f) the right to raise or lower the levels of a body of water adjacent to the land, regardless of the effect upon the land, but subject to the payment of compensation for permanent improvements on the land to the extent that the improvements are damaged thereby.

AGREEMENT OF THE COMMISSIONERS AS TO THE MANNER IN WHICH THE PROVISIONS OF THE CONCURRENT ACTION OF 1902–1903, OF ARTICLES VI AND VII OF THE TREATY OF 1908, AND OF ARTICLES I AND II OF THE TREATY OF 1905 SHOULD BE CARRIED OUT

At a meeting of the Commissioners held in Washington on March 16, 1904, their appointments under the concurrent action of the two Governments were presented and found to be in due and proper form. At this and subsequent conferences, including the first meeting of the Commissioners under the treaty of 1908 held in Ottawa on December 28, 1908, it was agreed that the reestablishment of the boundary under the concurrent action of the two Governments in 1902–1903 and under the provisions of articles VI and VII of the treaty of 1908 and articles I and II of the treaty of 1925 should be carried out in the following manner:

I. That the retracement and mapping of the parts of the boundary line west of the summit of the Rocky Mountains, done in 1901 1 and 1902, in which both Governments participated prior to their concurrent action regarding this part of the boundary, should be accepted; and that the results should be incorporated in

the final reports made by the Commissioners.

II. That, in accordance with the instructions received from their respective Governments, the boundary line along the 49th parallel between the United States and Canada from Point Roberts to the summit of the Rocky Mountains should be located in accordance with the conclusions of the Commission of 1857–1869, signed by the Commissioners in Washington May 7, 1869, namely: "It is agreed by the Commissioners that between any two successive defined points marked on the ground, shown on the maps, and set forth in the accompanying lists, the line of boundary above described is to be understood to be a right or straight line; and this rule is to apply throughout the entire boundary without regard to the distances between the consecutive monuments or to the course of the parallel in such intervals."

III. That, in order to expedite the work and to save expense, the United States parties and the Canadian parties should work independently; and, taking into consideration the difficulties and estimated cost of the work in different localities, in order to bring about an equal division of the expense, the following sections of the line west of the summit of the Rocky Mountains should be surveyed and

monumented by Canadian parties:

From Point Roberts to the boundary crossing of the Skagit River___ 91 miles
From the crossing of the Similkameen River to the crossing of the
Kettle River at Midway, British Columbia______ 42 miles

¹ Parts of sheets 10, 17, and 18 of the 49th parallel boundary maps are marked "surveyed in 1901."

From the crossing of the Kettle River near Laurier, Washington (Cascade, British Columbia), to the crossing of the Kootenai ² River at Porthill, Idaho	77 miles
Total	210 miles
and the following sections of the line west of the summit of the Rocky I should be surveyed and monumented by United States parties:	Mountains 1
From the crossing of the Skagit River to the crossing of the Similkameen River	63 miles 26 miles 111 miles
Total	200 miles
and that each Government should bear all the expenses of surveying and ming the sections as set forth above. That the following sections of the line east of the summit of the Rocl tains should be surveyed and monumented by United States parties acc by a Canadian representative:	onument- xy Moun-
From the summit of the Rocky Mountains to the railroad crossing at Sweetgrass, Montana (Coutts, Alberta), Monument 272 to Monument 333 From the first original monument west of Frenchman Creek to the first monument west of west branch of Short Creek, Monument 478 to Monument 620 From the first monument west of Red River to the Northwesternmost Point of Lake of the Woods, Monument 832 to Monument 925	95 miles 208 miles 115 miles
Total	418 miles
and the following sections of the line east of the summit of the Rocky Mountains should be surveyed and monumented by Canadian parties accompanied by a United States representative:	
From Coutts, Alberta, to the first original monument west of Frenchman Creek, Monument 333 to Monument 478. From the first monument west of west branch of Short Creek to the first monument west of Red River, Monument 620 to Monument 832.	
Total	462 miles
and that each Government should bear all the expenses of surveying and monumenting the sections as set forth above. IV. That east of the summit of the Rocky Mountains, in following the provision of the treaty of 1908 which reads: "In the intervals between the monuments along the parallel of latitude, it is agreed that the line has the curvature of a parallel of 49° north latitude; and that such characteristic shall determine all questions that The spelling authorized by the United States Board on Geographical Names is Kootenai; by the Geographic	

² The spelling authorized by the United States Board on Geographical Names is *Kootenai*; by the Geographic Board of Canada, *Kootenay*.

may hereafter arise with reference to the position of the boundary at any point between neighboring monuments", that all intermediate monument locations should be determined by offsets from the chord joining original monuments and that the intervals between adjacent monument sites should be held down to such lengths that on the ground the straight lines joining adjacent monuments will closely conform to a line joining the original monuments, which has the curvature of a parallel of 49° of north latitude.

V. That west of the summit of the Rocky Mountains the boundary line should be marked by aluminum-bronze monuments, set in concrete bases, at prominent places, such as roads, trails, and stream crossings, and so located that adjacent monuments will be intervisible where practicable; that the distance between monuments should not exceed 3 miles, save in very exceptional cases where 4 miles should not be exceeded; and that all monuments, recognized by the Commission of 1857–1869 as being on the line, should be replaced by new monuments, except Monument No. 1 (the obelisk at Point Roberts) and a few original monuments at sites

where permanent monuments cannot be maintained.

And that, from the summit of the Rocky Mountains east to the North Fork of Milk River, the boundary line should be marked by aluminum-bronze monuments set under the same specifications as to distance apart and intervisibility as those set west of the summit. That from the North Fork of Milk River east to Lake of the Woods one-piece hollow cast-iron monuments, filled with concrete, identical in form with those set in 1872–1875, should be set to mark the boundary at distances apart not to exceed 2 miles except in a few exceptional cases, where $2\frac{1}{4}$ miles should not be exceeded; and that adjacent monuments should be made intervisible where practicable.

VI. That each monument should bear a suitable number, cast in raised letters or outlined in drill holes in the metal, to identify it on the ground, in the joint report

of the Commissioners, and on the boundary maps.

VII. That the boundary through timbered areas should be further marked by a vista of sufficient width to give a cleared 20-foot sky line along the boundary.³

VIII. That, for the purpose of accurately defining, locating, and describing the boundary as laid down by the Commissioners, all boundary monuments and boundary reference monuments should be located geodetically on the North American datum of 1927 by triangulation or by traverses controlled by triangulation, and their positions should be certified by the Commissioners in their joint report as being a true description and definition of the International Boundary as reestablished, surveyed, and marked in accordance with the instructions issued under the concurrent action of the two Governments in 1902–1903 and in accordance with the provisions of articles VI and VII of the treaty of 1908 and articles I and II of the treaty of 1925.

IX. That the charts of the boundary, specified in articles VI and VII of the treaty of 1908, should consist of a series of 59 topographic maps, to be prepared from surveys made by the Commissioners, showing the boundary monuments, the course of the boundary, and the topography on each side of the line. That the scale of these maps should be 1: 62,500. That from the Gulf of Georgia (Georgia Strait) to the eastern foothills of the Rocky Mountains, that is, to longitude 113°30′, the topography should be shown on the boundary maps for a minimum distance of 2 miles on each side of the line and a contour interval of 100 feet should be used; that from the eastern foothills of the Rocky Mountains to Lake of the Woods, the topography should be shown for a minimum distance of 1 mile on each side of the boundary and a contour interval of 20 feet or less should be used.

³ Agreements I to VII were made and carried out in full prior to the conclusion of the treaty of 1925.

X. That the maps of the boundary should be engraved on copper plates and printed from lithographic stones using conventional symbols, and conventional colors, black, brown, blue, and green. That after the completion of the printing and after the signing of the official maps by the Commissioners, the engraved copper plates should be placed in safe storage and later should be equally divided between the two Governments.

XI. That the Commissioners' joint report to the two Governments on the reestablishment of this section of the International Boundary Line, required by articles VI and VII of the treaty of 1908, should be printed and copies thereof should be distributed to other Government agencies and to depository libraries of the two

countries.

RETRACEMENT OF THE BOUNDARY LINE

The work of retracement of the boundary line from the Gulf of Georgia (Georgia Strait) to the Northwesternmost Point of Lake of the Woods, as provided for under the agreement for concurrent action by the two Governments in 1902 and 1903 and under the provisions of the treaty of 1908 and the treaty of 1925, primarily consisted of the recovery and identification of the monuments and marks established in the original demarcation of the line. The original demarcation was that made by the Commissioners of 1857–69 in accordance with the provisions of the treaty of 1846 for that portion of the line west of the Rocky Mountains, and by the Commissioners of 1872–76 in accordance with the provisions of the Convention of London of 1818 and the treaty of 1842 for that portion of the line east of the Rocky Mountains.

For the part of the boundary west of the Rocky Mountains, the identification of the monuments and marks was made through the descriptions and other information contained in the "Table of astronomical and geodetical stations located and determined by the United States and British Commissions from which the 49th parallel of north latitude was defined", the "Table of longitudes of monuments marking the 49th parallel of north latitude", and "The topographic maps of the boundary", jointly signed at Washington on May 7, 1869, by Hawkins and Campbell, the Commissioners of 1857–69. While these comprised the available authoritative definition and description of this boundary, additional useful information was found in the correspondence of Colonel Hawkins, the British Commissioner, in the "Foreign Office Correspondence" of Great Britain. No written joint report of the survey was made. While it is known that Commissioner Campbell made a written report to his Government, unfortunately it was not published, and the manuscript has been lost from view for many years.¹

The original monuments from Monument 1, the large stone monument on the west shore of Point Roberts, to Monument 43 ² in the Columbia Valley, were all cast-iron pillars set at an average distance of about 1 mile apart. They were all recovered and identified as being in their original positions except Monument 7 which had apparently been moved south about 6 feet in the process of road construction. This monument was shifted to the north to a point on the curve of the 49th parallel as defined by the adjacent monuments, in conformity with the record of its original location.

From the Columbia Valley eastward through the Cascade Mountains to the east bank of the Similkameen River, a distance of about 108 miles, the boundary had been marked by 21 cairns or pyramids of stones and one bench mark cut in bedrock. These marks, numbered 44 to 65, had been set in the principal valleys crossing the boundary, and in some instances were long distances apart. They were

¹ See appendix III, p. 196.

² The British system of numbering from west to east is used west of the Rocky Mountains throughout this text.

all recovered and identified except the cairns numbered 44 and 45, in the Tamihi Valley. Three cairns had been set here, 44, 45, and 46, a short distance apart, and a vista had been cut between them. Number 46 was recovered and positively identified by a center stake found under the remains of the cairn and by the cuttings of the old vista which were still distinct. The old vista was recut westward from cairn 46, and measurements were made along it to where cairns 45 and 44 should have been according to the records of the original Commission, but falling timber and snow-slides had obliterated all traces thereof. The monuments set to take their places were located in the middle of the original vista, on the curve of the 49th parallel passing through cairn 46, and as nearly as practicable at the longitudes of the original cairns.

From the Similkameen River to the east bank of the Columbia River, a distance of about 95 miles, the boundary had been marked at frequent intervals by cairns, except in one instance where stone could not be found within a reasonable distance. Here, according to statements by Commissioner Hawkins, the mark was built of logs. These marks, numbered 66 to 133, were all recovered except numbers 126, 132, and 133. Number 126 evidently was the log mark. Its general location was identified by the topographic maps, the traces of the original vista, and its relation in longitude to the adjacent cairns. It was relocated in its recorded longitude on the curve of the 49th parallel as defined by these cairns. Cairn number 132 and cairn number 133 which stood 129 yards apart on the gravel bank on the east side of the Columbia River had been destroyed by placer mining operations. Their approximate sites were recovered by measurements from cairn 131 on the west bank of the river and then checked by astronomic observations for latitude and azimuth. These two cairns were eventually replaced by one monument, now numbered 181, set about 20 meters to the west of the original recorded site of cairn 133 and in its original recorded latitude.

From the Columbia River to the summit of the Rocky Mountains the 28 boundary marks, numbered 134 to 161, were all recovered with the exception of cairn 150 on the hillside east of the Yaak* River. From the evidence on the ground it is probable that no cairn had ever been erected on this site. Cairn 149 being but a short distance to the westward, no attempt was made to recover the exact site of or to replace the missing boundary mark.

Thus 154 of the 161 recorded original marks on the boundary from Georgia Strait to the summit of the Rocky Mountains were recovered and identified as being on their original sites.

The retracement of this section of the boundary was completed by running and marking straight lines between the consecutive original monuments or cairns in conformity with the last paragraph of the minutes of the final meeting of the Commission, dated and signed May 7, 1869, which reads:

It is agreed by the Commissioners that, between any two successive defined points, marked on the ground, shown on the maps, and set forth in the accompanying lists, the line of boundary above described is to be understood to be a right or straight

^{*}Yaak is the spelling authorized by the United States Board on Geographical Names. Yahk is the spelling authorized by the Geographic Board of Canada.

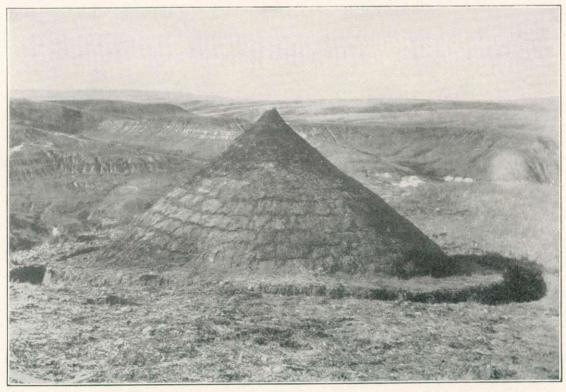
line; and that this rule is to apply throughout the entire boundary without regard to the distances between the consecutive points or to the course of the parallel in such intervals.

This surveying of "straight lines" between the original boundary marks was not easy of accomplishment. The distances were great, sometimes as much as 20 to 25 miles, the exact azimuth of the course to be run was not known, and high



ORIGINAL BOUNDARY CAIRN 356 EAST OF THE SUMMIT OF THE ROCKY MOUNTAINS, NOW REPLACED BY MONUMENT 331. CAIRN ERECTED IN 1873 OR 1874. PHOTOGRAPHED IN 1910

mountain ranges and deep valleys had to be crossed. Great care was exercised in the performance of this work. The results have been fully checked by subsequent triangulation for the purpose of determining the geodetic positions of the monuments,



ONE OF THE EARTH MOUNDS USED TO MARK THE INTERNATIONAL BOUNDARY ON THE PRAIRIE IN 1872-74. PHOTOGRAPH FROM FORMER COMMISSIONER DR. W. F. KING'S COLLECTION OF 1872-74

and the degree of accuracy of the alinement is shown in the tabular description and definition of the boundary line included in this report.

For the boundary east of the summit of the Rocky Mountains the recovery and identification of the boundary marks established in the original survey and demarcation by the Commission of 1872–1876 was made through the information set forth in the protocol of the final proceedings of the Commission signed in London May 29, 1876, including the final records and maps enumerated in the protocol and on file in the Foreign Office in London and in the archives of the Department of State at Washington, and in the detailed report of the United States Commissioner to the Secretary of State.

The 388 original boundary marks established by the Commission to mark this section of the boundary were recovered and identified with but one exception, original cairn 213, in the town of Portal, North Dakota. The site of this cairn was recovered by its recorded position relative to the next neighboring unobliterated marks, numbers 212 and 214, as provided for in the protocol of the Commissioners of May 29, 1876. The new monument is now numbered 630.

After the recovery of the monuments and cairns marking the line east of the summit of the Rocky Mountains, the retracement was completed on that part of the boundary by surveying and marking the line on the curve of the 49th parallel between the consecutive original boundary marks as provided for in the second article of the agreements of the original Commissioners.³

On the meridian line from the Northwesternmost Point of Lake of the Woods to the 49th parallel the retracement of the line was made in accordance with the first article of the agreements of the original Commissioners as given in the proceedings of their final meeting, May 29, 1876, which reads as follows:

The three hundred and eighty-eight (388) monuments detailed in the list referred to in section b of paragraph numbered one, are on and mark the astronomic lines stipulated by the second article of the Convention of London (signed October 20, 1818) to be the line of Boundary between the territories of Her Britannic Majesty and the United States of America, from the Lake of the Woods to the Stony (i. e., Rocky) Mountains.⁴

The astronomic lines referred to above are the 49th parallel and the meridian line.

The meridian, or "due south" line, was accepted as defined by the seven original monuments set by the Commissioners of 1872–1876. After the seven monuments, numbers 1 to 7, were all recovered, the retracement was completed by projecting the straight line through all of the seven monuments southward to its intersection with the 49th parallel in Lake of the Woods, as defined by original cairn 1 of the 49th parallel on the west shore of Lake of the Woods, and by prolonging the said meridian northward to the Northwesternmost Point of Lake of the Woods as selected by Dr. J. L. Tiarks, in 1825, and accepted by the two Governments in the treaty of 1842.

³ For text of the second article of the agreements, see appendix III, page 217.

The second article of the agreements of the original Commissioners was modified by the treaty of 1925 so that the boundary is now a straight line between consecutive monuments set prior to 1925.

⁴ For full text of proceedings of the Commissioners, see page 216.

In making a physical determination of the boundary, however, a situation became apparent that was not desirable to either country. The boundary line following the Northwest Angle Inlet, which had been adopted as a part of the boundary from Lake Superior to the Northwesternmost Point of Lake of the Woods, crossed the meridian boundary as marked by the seven monuments no less than five times,⁵ thereby enclosing between the two boundaries two small areas of United States waters in Lake of the Woods, containing but $2\frac{1}{2}$ acres, entirely surrounded by Canadian waters.⁶

Upon the recommendation of the Commissioners, the parts of the north-and-south line and of the line in the channel lying northward of their most southern intersection were eliminated from the International Boundary by the treaty signed at Washington February 24, 1925.⁷

The boundary from the Gulf of Georgia (Georgia Strait) to the Northwesternmost Point of Lake of the Woods as thus retraced was marked throughout by replacing the original monuments and other marks with new monuments where necessary and by setting intermediate monuments on the lines established between the old marks.⁸

Since the adoption of the treaty of 1925 all new marks and monuments set in the course of maintenance work have been set with due regard to the provisions of articles I and II ⁹ of that treaty.

⁵ See details, page 141, and map, page 138.

⁶ Treaty of 1925, page 12.

⁷ See article I of the treaty, page 11.

⁸ See chapter on Monuments and Monumenting, page 115.

⁹ For text of treaty, see page 11.

FIELD OPERATIONS

The field operations of the resurvey and remonumenting of the International Boundary Line from the Gulf of Georgia (Georgia Strait) to the Northwesternmost Point of Lake of the Woods were begun in the spring of 1901 and were carried on each successive season with varying forces and under varying conditions until 1914. After the last date small amounts of field work were done in 1917, 1918, 1919, 1921, 1922, and, after the adoption of the treaty of 1925, in 1926 and each successive year thereafter.

As a result of an informal exchange of notes 1 between the two Governments regarding the need of more effectively marking parts of the 49th parallel land boundary west of the summit of the Rocky Mountains, independent though cooperating parties of both Governments were placed in the field in the summer of 1901 to make a general reconnaissance. The reconnaissance was continued, by Canadian parties only, in 1902. The data gathered by these reconnaissances were used in formulating the terms of "concurrent action" 2 of the two Governments in 1902 and 1903 under which representatives or commissioners were designated to act jointly in renewing lost or damaged monuments and in placing additional monuments on the part of the boundary lying west of the Rocky Mountains. Following the appointment of Commissioners, and under their direction, constructive work was undertaken by separate United States and Canadian parties operating each season from 1903 to 1907. The work during this period included a complete retracement of the original boundary, the monumenting thereof, the cutting of a vista through the timbered sections, the execution of a scheme of triangulation for topographic control, and the making of modern topographic maps covering the entire boundary.

On April 11, 1908, the treaty providing for the more complete definition and demarcation of the International Boundary between the United States and the Dominion of Canada from the Atlantic Ocean to the Pacific Ocean was concluded between the two Governments. Upon the conclusion of the treaty, field operations on the boundary west of the summit of the Rocky Mountains were carried to completion under the provisions of article VII of the treaty.

East of the summit of the Rocky Mountains the work was done by separate United States and Canadian parties accompanied by representatives of the other Government. Work was begun immediately following the conclusion of the treaty of 1908 providing for it, and was carried on each successive season until 1914. By this time the work of retracing, remonumenting, vista cutting, triangulation, and mapping had been virtually completed. Later, office computations of the geographic positions of the boundary monuments showed that supplemental triangulation or traverse should be done east of the summit of the Rocky Mountains to make sure

¹ See diplomatic correspondence: Appendix II, page 192.

² See concurrent action: Appendix II, page 193.

that the monuments interpolated between monuments of the original survey had been correctly placed on the arc of the parallel. This work was done by small United States parties in 1917, 1918, 1919, and 1921.

In 1922 a small joint party was sent to the western end of the boundary line to make additional surveys which had not seemed necessary in the earlier days of the work, to recut the vista from Monument 1 to Monument 43, and to repair damaged monuments.

The demarcation of the boundary was now virtually completed, the exceptions being the geodetic determination of a number of monuments west of the summit of the Rocky Mountains and the adjustment of all the monument positions to the North American geodetic datum. The necessary triangulation and traverse were done subsequent to the adoption of the North American datum of 1927 and in conjunction with boundary maintenance under article IV of the treaty of 1925.

The technical details of the field operations will be found in the chapter on "Field and Office Methods and Results."

SEASON OF 1901—RECONNAISSANCE WEST OF THE ROCKY MOUNTAINS

The field work carried on in 1901 was a reconnaissance of that part of the boundary lying west of the summit of the Rocky Mountains. Its immediate purpose was to satisfy the current demand for the identification of the boundary in certain places and to furnish the two Governments with more complete information relative to the condition of the line preparatory to making plans for a more complete resurvey and demarcation of the entire boundary between their territories.

One Canadian party was assigned to the section of the boundary between Point Roberts and the Skagit River, referred to hereafter as the western Canadian party, and one to the section of the boundary between the Similkameen and Columbia Rivers, hereafter referred to as the eastern Canadian party. A geologist 3 and a naturalist were attached to the western Canadian party. The United States group consisted of an astronomic party, a topographic party, and three geologic reconnaissance parties. The astronomic and topographic parties were assigned to the parts of the boundary where local misunderstanding regarding its location had arisen—more particularly across the valley of Silesia Creek; 4 between Midway, British Columbia, and Cascade, British Columbia; and in the vicinities of Gateway, Montana, Tobacco Plains, and Wigwam River. The first geologic reconnaissance party was to operate between Point Roberts and Osoyoos Lake, and the second

³ The same geologist, R. A. Daly, with a subparty was attached to the Canadian boundary survey party each year to and including 1906. A detailed geological report based upon his field work, which covered the entire mountain section traversed by the International Boundary, under the title "Geology of the North American Cordillera at the Forty-ninth Parallel", by Reginald Aldworth Daly, was published in three volumes as an appendix to the report of the chief astronomer of the Department of the Interior of Canada, for the year ended March 31, 1910. The report was republished as "Memoir No. 38, Department of Mines, Geological Survey of Canada, 1912." As Dr. Daly's work did not include identification or survey of the boundary it will not be further referred to in this report.

⁴ Silesia Creek is the spelling authorized by the United States Board on Geographical Names. Early spellings appear on maps as Senehsay, Senehsai, Slesse, and Selacee.

between Osoyoos Lake and the west crossing of the Kootenai ⁵ River at Porthill, Idaho; and the third from the west crossing of the Kootenai River at Porthill, Idaho, to the summit of the Rocky Mountains.

The general instructions to the parties were to find out, in the sections assigned to each: first, what parts of the boundary surveyed and marked between 1857 and 1861 were still recognizable; second, whether such parts corresponded to the true



INSTRUMENT PIER USED IN 1859-60 AT THE SENEHSAI LATITUDE STATION ON SILESIA CREEK. PHOTOGRAPHED IN 1901

treaty boundary, namely, the astronomic 49th parallel of north latitude; third, what parts of the boundary had not been surveyed and effectively marked, and what points should be marked to constitute a certain and effective location of the 49th parallel boundary throughout its course from the summit of the Rocky Mountains westward to the Gulf of Georgia (Georgia Strait).

WESTERN CANADIAN PARTY

The western Canadian party was organized late in May at Chilliwack, British

Columbia. The section of the boundary on which they were to be engaged, from the Skagit River on the east to the coastal plain at the base of the Cascade Mountains on the west, presents more barriers to travel and to survey for a distance of about 50 miles than any other section of the parallel. The mountain crests rise to heights as great as eight and nine thousand feet. The valleys between them are deep and narrow and with sides so steep and precipitous that in many instances the rise from the valleys to the crests is as great as 6,000 feet in a distance of two miles. Rain and snowfall are extreme. Damp climatic conditions have fostered a forest growth of an immense size and density that covers the whole region except on the highest summits. Fallen timber, dense underbrush, rock slides, cliffs, precipices, the steepness of the mountain slopes, and the numerous glaciers of the higher peaks, all combine to make travel and surveying difficult and dangerous.

The party moved up the Chilliwack Valley to the mouth of Silesia Creek and from there made a side trip up Silesia Creek to the boundary to meet the United States topographic and astronomic parties which had preceded them over the same route a few days before. As this was one of the places where misunderstanding existed as to the location of the boundary, it was deemed advisable that both Governments should be represented. Here an old post which had recently been mistaken by prospectors for a mark on the boundary was positively identified as being

⁵ Kootenai is the spelling authorized by the United States Board on Geographical Names. Kootenay is the spelling authorized by the Geographic Board of Canada.

the latitude observation post, 343 feet north of the boundary, used by the Commission of 1857–69. Starting at this post a traverse was run the required distance south to the boundary disclosing and positively identifying cairn 47 ⁶ (now Monument 55) and other boundary marks.

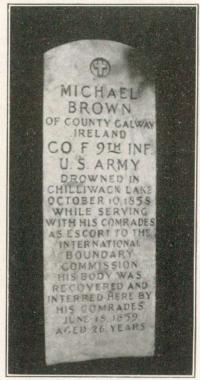
The United States party remained to mark the boundary while the Canadians returned to the mouth of Silesia Creek and turned their attention to trail building up the Chilliwack River. After several days of arduous work the Canadian party reached the mouth of Middle Creek where it became necessary to bridge the Chilliwack River. This was done by felling a fir tree 8 feet in diameter across the stream and flattening the top surface for a foot walk for the pack animals. From the camp

at the mouth of Middle Creek a trail was opened for about 2 miles up Middle Creek and the trail up the river was completed to the foot of Chilliwack Lake.

Trail building did not appear practicable along the precipitous and rugged sides of Chilliwack Lake. Therefore, a cache was built at the foot of the lake and arrangements made for the pack train to make weekly trips to Chilliwack for mail and supplies. A large raft and a cedar dugout canoe were made with which to traverse the lake. Using these, and with the aid of a fair wind, the outfits were transported to the head of the lake and camp was pitched on the bank of Dolly Varden Creek about one-half mile from the head of the lake and near the boundary.

From the camp on Dolly Varden Creek, boundary cairns 50 and 51 (now replaced by Monuments 62 and 63) were found in good condition. A vista was opened along the tangent to the parallel to the summit of the ridge on either side of the creek, and phototopographic surveys were made.

When this work was completed, the party moved down the lake to the mouth of Depot Creek and set up camp on the site of the old survey camp of 1857. They found near the camp the headboard of the grave of a soldier who had been a member of the military escort



HEADSTONE OVER THE GRAVE OF MICHAEL BROWN, ERECTED BY THE INTERNATIONAL BOUNDARY COM-MISSION, 1936, WITH THE COOPERA-TION OF THE UNITED STATES ARMY

of the original survey party. The rough cedar cross carried an inscription to the effect that here was buried Michael Brown, a native of County Galway, Ireland, who was drowned in 1858, and was buried by his comrades of Company F, 9th Infantry, U. S. Army. A clearing was made around the grave and the headboard was renewed.⁷

⁶ Original boundary cairns and monuments are referred to by their numbers from west to east unless specifically stated otherwise.

⁷ In 1935 a Canadian party reported that the cedar cross marking the grave had become so decayed that it could no longer be maintained. The personnel of the Boundary Commission referred the condition of the grave to the War Department of the United States with the result that the Department furnished a suitable marble slab carrying the full inscription found on the wooden cross, and during the summer of 1936 the personnel of the Boundary Commission, both Canadian and United States, erected the marble slab, set in a solid concrete base, over the grave. A substantial contribution toward the cost of this work was made by the present Company F.

A foot trail was opened up Depot Creek and a side camp made at the end of the trail near the boundary. From this camp, boundary cairn 52 (now Monument 65) was found, as firm and symmetrical as the day it was built. The old vista was cleared for some distance east of the cairn and also 1,000 feet westward to Depot Creek.

The party now returned to the main camp at the mouth of Depot Creek and moved by raft down the lake to the cache where the pack train awaited them. A move was then made by pack train down the Chilliwack to the mouth of Middle Creek and up that creek the 2 miles to the end of the trail cut earlier in the season. The next two weeks were spent in cutting trail and moving up Middle Creek to the boundary crossing. The old latitude station a short distance north of the line, a boundary mark chiseled on the face of a rock and originally numbered as monument 48 (now Monument 57), and boundary cairn 49 (now Monument 58) were found. The old vista was opened for about 2 miles east and for a short distance west of the boundary marks. The party then retraced their steps down the Chilliwack Valley to the mouth of Tamihi Creek. A horse trail was opened up the rugged valley of the Tamihi for about 6 miles, and a foot trail the remaining distance to the boundary. The old vista along the line was easily found, but the boundary cairns were not found at this time.

Stormy weather forced the party to withdraw from the valley to lower altitudes on September 15. The move was down the Chilliwack and around by Sumas Prairie to Monument 41. From here, working westward, they opened up the old vista to Semiahmoo ⁸ Bay and inspected all the monuments to No. 1, on Point Roberts. All of the monuments were found in place except Monument 7, which had evidently been moved about 6 feet south by road builders. Several others were found slightly damaged. The field season ended on November 15.

The personnel of the western Canadian party was: Chief of party, J. J. Mc-Arthur, D. L. S.; assistants, J. M. Bates, E. T. de Coeli, J. W. McArthur; naturalist, J. M. Macoun; assistant naturalist, Wm. Spreadborough; geologist, R. A. Daly; and 10 hands.

EASTERN CANADIAN PARTY

The eastern Canadian party was organized at Midway, British Columbia, on May 15. It consisted of 15 men and was provided with 15 pack horses. The party began field work at boundary cairn 98 (now Monument 143) and worked westward.

Before much progress had been made, the United States topographic and astronomic parties arrived at Midway, and a consultation between the chiefs of the Canadian and United States parties resulted in an agreement that the Canadian party should continue work westward to the Similkameen River and the United States parties should work eastward from Midway to Cascade.

The Canadian party examined all the boundary marks westward to boundary cairn 64 (now Monument 109) on the west side of the Similkameen River and found

⁸ Semiahmoo is the spelling authorized by the United States Board on Geographical Names. Semiamu is the spelling authorized by the Geographic Board of Canada.

them in good condition. They opened a vista from 6 to 10 feet wide along the boundary throughout the entire distance and also measured the deflection angles of the line at the boundary cairns.

This work was on the section of the boundary where the Commission of 1857–1869 had first run and marked as the boundary a line joining points on the astronomic parallel and later had adopted a mean parallel in lieu thereof. They had erected cairn monuments on the line joining the astronomic points and cut a continuous vista. When the line was changed to a mean parallel, new monuments were erected and those on the abandoned line, with one exception—cairn 96 (now Monument 141) on the high summit just south of Midway—were torn down. A vista on the mean parallel line was cut only near the cairn monuments and on the prominent summits. This left two lines marked, one, the abandoned line, well marked by vista and still showing the remains of the cairns; the other, the adopted line, poorly marked by the vista and monumented throughout with cairns. These two marked lines later caused the confusion which existed among local residents in regard to the location of the boundary when the reconnaissance of 1901 was undertaken.

After completing the work between Midway and the Similkameen River, the Canadian party proceeded to Cascade and carried on similar operations between boundary cairns 120 and 127 (now Monuments 166 and 174). In addition to retracing the boundary and cutting the vista, they did phototopography during the entire season.

The party was forced by unfavorable weather to retire from the field on October 22, without reaching their hoped-for objective on the Columbia River.

The personnel of the eastern Canadian party was: Chief of party, W. F. O'Hara, D. L. S.; assistants, Bruce Strachan, J. M. Sheppard; and 12 hands.

United States Astronomic and Topographic Parties

The United States astronomic and topographic parties were organized in Seattle, Washington, early in May. They were under instructions to cooperate and to supplement each other's work. As soon as organization was completed they proceeded to Chilliwack, British Columbia, stopping on the way at New Whatcom (now Bellingham), Washington, to confer with prospectors who had located mining claims on Silesia Creek and were in doubt as to the location of the boundary across that stream.

At Chilliwack additional hands were employed and a pack train was hired for transportation to the boundary. The parties proceeded to the boundary, traveling up the Chilliwack River and Silesia Creek, over almost impassable trails, for a distance of 32 miles. They reached the boundary on May 23 and went into camp on Silesia Creek near the old observation post of the latitude station of 1859.

The astronomic party made latitude observations at the old station and obtained results which closely approximated those of the observations of 1859. They then ran a traverse south, following the creek bottom, the requisite distance from the station to the boundary. A search for the boundary cairn was then made. After clearing the tangle of underbrush and weeds, a circular pile of stones about 6 feet in diameter and 1 foot high, having the appearance of being artificial, was

found amid drift carried down by floods. No center stake or mark was found under it, but measurements made to a Y cut in a large boulder on the west side of Silesia Creek, to which measurements had been made in 1859, verified the stone pile as being the remains of boundary cairn 47 (now Monument 55).

In the absence of a center mark, the center of the stone pile was accepted as marking the boundary line, a center mark was made, and the cairn rebuilt to a height of about 3 feet. An azimuth was observed here and the boundary projected to the summits of the ridges both east and west of the creek. This line was not cleared continuously but was plainly blazed where not cleared. The boundary thus identified was temporarily marked by an iron post set in a mound of stone 3 feet high, 6 feet east of the boundary cairn; by an iron post set on the summit of the ridge 4,000 feet west of the boundary cairn; by an iron post set on the summit of a spur ridge 6,000 feet east of the boundary cairn; and by an iron post set on the summit of an intervening spur ridge east of the boundary cairn. The old post used for a latitude station was also marked. An iron post was set 2 feet west of the latitude station and a bronze disk was set 15.8 feet southeast of it in a large granite boulder.

While the work of the astronomic party was going on, the topographic party mapped the adjacent territory. Ground conditions being very unfavorable for a tape-measured base, a base was measured by stadia across a ravine and connected with the astronomic station. A scheme of plane-table triangulation was executed from the ends of the base to the nearby mountain tops and a closely estimated elevation was assumed. With this control, a topographic map was made, on a scale of 1:45,000 and a contour interval of 100 feet, of a strip of territory 2 miles wide on each side of the boundary, by about 5 miles long, from summit to summit across the Silesia Creek valley.

As previously stated, during the progress of the work on Silesia Creek, the United States parties were visited by members of the western Canadian party who examined the recovered boundary marks and confirmed their authenticity.

The work of all the parties was greatly hampered by heavy rains and cloudy weather, and what should have been accomplished in a few days was not completed until June 23. On June 24 the United States parties returned to Chilliwack and from there traveled by train over the Canadian Pacific Railway to Midway, British Columbia, there to take up work on the second section of the line where local misunderstandings had arisen as to the location of the boundary. They found the eastern Canadian party in camp about 10 miles west of Midway.

According to the agreement between the chiefs of party already related, the United States parties took up work to the eastward. They began work by measuring a base with a steel tape on the open flats near Midway from which was developed a scheme of triangulation eastward along both sides of the boundary for plane-table control.

As work progressed three astronomic stations were established at which latitude and azimuth were observed: the first near Midway on the boundary on the bank of Boundary Creek near boundary cairn 98 (now Monument 143); the second near Carson, British Columbia, at boundary cairn 108 (now Monument 153); and

the third near Russell (now Laurier) at boundary cairn 119 (now Monument 164). Meridian lines were established and marked by iron posts at all three of these stations.

The boundary line was resurveyed from boundary cairn 96 (now Monument 141) to boundary cairn 112 (now Monument 157) and marked by cutting a vista. Along this interval the deflections of the line at the monuments were measured with a theodolite, the distances between monuments measured by stadia readings, and the adjoining country was mapped.

Boundary cairns from 96 (now Monument 141) to 112 (now Monument 157) were all recovered, and with but two exceptions were found in good condition. These two cairns were rebuilt. Cairns 119 to 122 were also visited and found in

good condition.

Upon the conclusion, on August 12, of these operations, the parties moved eastward to the Gateway, Tobacco Plains, and Wigwam districts.

In these districts boundary cairns 6, 7, 8, 9, and 10, numbered west from the summit of the Rocky Mountains (now replaced by monuments numbered 255, 254, 247, 245, and 243), were recovered. The original vista across the Wigwam Valley between cairns 6 and 7 was still discernible. At cairn 8 the old vista extended about one-half mile to the east and was continuous to the west to the foot of the mountain west of the Kootenai River, a distance of about 9½ miles. Latitude and azimuth were observed at stations near boundary cairn 6 in the Wigwam Valley, near cairn 8 at Phillipps Creek, and near cairn 9 on the bench on the east side of the Kootenai River. Azimuth lines were established and marked with iron posts at all three of the azimuth stations, those near boundary cairns 8 and 9 were placed on the meridian, the one near cairn 6 was placed on the tangent. The 13-mile chord between cairns 7 and 8 was run out and from it the curve of the mean parallel 9 between the two cairns was established and opened up by cutting a vista along its entire length. This vista was continued eastward on the tangent to the parallel for some distance beyond cairn 6. The boundary was temporarily marked by setting five iron posts at prominent places on the curve between cairns 7 and 8 and an iron post on the line about midway between cairns 8 and 9. Boundary cairns were repaired or rebuilt as their condition demanded.

A topographic map was made covering a strip 2 miles on each side of the boundary from the Kootenai River to the summit of the ridge on the east side of the Wigwam Valley. The control for this map was a scheme of triangulation extending over the entire area mapped and developed from a base measured with a steel tape on the flats near Phillipps Creek. The topographic control included a stadia profile of the boundary from cairn 6 to cairn 10.

The astronomic party completed work here before the topographic party did. Leaving the latter to finish the mapping, they moved west to Waneta, British Columbia, near where the 49th parallel crosses the Columbia River.

In 1859 and 1860 the Boundary Commissioners had marked the boundary crossing of the Columbia River by a cairn on the west bank of the river and two

⁹ This was an error on the part of the engineers in charge, as the line should have followed the chord. The error was corrected in the final survey.

cairns 129 yards apart on the high gravel bar on the east bank. The astronomic party of 1901 was unable to find any trace of the two cairns on the east side of the river, as the gravel bar had been entirely worked over by placer miners. The approximate sites of the two cairns on the east bank of the river were recovered by measurements from the cairn on the west bank, and an astronomic station was established nearby and marked with an iron post at which latitude and azimuth were observed. This concluded the season's work of the astronomic party, and it proceeded to Spokane and disbanded on October 18.

In the meantime, the topographic party had completed its work in the East Kootenai district, moved its outfit to Kalispell, Montana, and disbanded on October 18.

The personnel of these two parties was: United States astronomic party: Chief of party, C. H. Sinclair; assistants, H. F. Flynn, O. B. French; and two hands. United States topographic party: Chief of party, E. C. Barnard; assistant, Horace Dunaway; and four hands. Additional hands were employed locally from time to time by both parties as needed.

FIRST UNITED STATES GEOLOGIC PARTY—POINT ROBERTS TO OSOYOOS LAKE

The first United States geologic party was organized at Ellensburg, Washington. A pack train belonging to the United States Geological Survey, which had been wintered in the valley nearby, was obtained to provide transportation in the rugged mountain country to be examined.

The work of this party was largely to make a geologic reconnaissance and to collect information regarding the physical characteristics of the border country, as well as to identify cairns and vista cuttings marking the boundary.

On June 21 the party left Ellensburg en route for the boundary. The route lay across Table Mountain to Wenatchee, thence up the west side of the Columbia and Okanogan Rivers to the junction of the Similkameen and Okanogan Rivers, about 5 miles south of the boundary. A geologic reconnaissance was made along the route.

Work at the boundary was begun from the camp at the junction of the Simil-kameen and Okanogan Rivers on July 10. In connection with the geologic reconnaissance, boundary cairn 72 (now Monument 117) on the west bank of Osoyoos Lake and boundary cairn 71 (now Monument 116) were visited and found to be in good condition.

The party's next move was westward to Palmer Lake, where boundary cairns 64 to 70 (now Monuments 109 to 115) were all found without difficulty.

Up to this time the country covered had been open and easy of access and no difficulties of travel had been experienced. West of boundary cairn 64 (now Monument 109) on the Similkameen River the character of the country abruptly changes. The mountains are high and rugged, the valleys heavily timbered up the steep slopes nearly to the tops of the mountains. The country was unsettled and practically without trails.

The party entered this country from Palmer Lake and carried their reconnaissance westward along the line. Boundary cairns 61, 62, and 63 (now Monuments

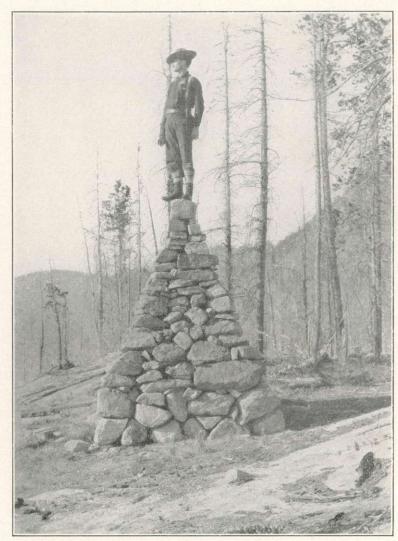
99, 100, and 101) were recovered in the valley of a tributary of the Ashnola River on July 26. The vista across the valley was easily identified and the old astronomic station with its log cabin built 42 years before was found undisturbed.

Continuing westward the party recovered boundary cairns 59 and 60 (now Monuments 85 and 86) on opposite sides of the Pasayten River, on August 13. The location of these cairns required a three-days' trip on foot from the nearest point reached by the pack train. Boundary cairns 57 and 58 (now Monuments 81)

and 82) in the Chuchuwanten Valley were not found at this time, although four days were spent in searching up and down both sides of the valley for signs of the old vista, and one day in running a traverse from cairn 59 to locate the boundary crossing.

From the Pasayten Valley the route of travel was across the mountains to Slate Creek and thence down Slate and Ruby Creeks to the Skagit River, where a camp was made at the mouth of Ruby Creek.

The chief of party accompanied by one man made a trip on foot from the camp at the mouth of Ruby Creek over the abandoned Fort Hope trail 30 miles up the Skagit River to the boundary crossing. There they found signs of the old cuttings of the vista on the east side of the river and boundary cairn 56 (now Monument 72). They did



ORIGINAL BOUNDARY CAIRN 61, ERECTED IN THE SURVEY OF 1858-62, NOW REPLACED BY MONUMENT 99. PHOTOGRAPHED IN 1905

not cross the river to search for boundary cairn 55. Low hanging clouds prevented them from noting if any signs of the vista still remained on the west side of the river.

Upon the return of the chief of party from this trip, camp was moved down the Skagit River to Sedro Woolley, Washington, thence northward to Demming, Washington, in the valley of the Nooksack River and into the Mount Baker mining district. The chief of party, himself, upon reaching the railroad, went by train to

Maple Falls, Washington, and from there, on September 16 and 17, visited iron Monuments 40 to 43 (present numbers the same). From a camp at Twin Lakes a trip was made by the chief of party on September 20 and 21 down Tamihi Creek northward to the boundary. Cairn 46 (now Monument 52) was found. The search for cairn 45 (now Monument 51) was unsuccessful and limited food supplies prevented a search for cairn 44 (now Monument 50).

On September 26 a trip was made from a camp at the head of the state trail westward to Hannegan Pass at the head of Chilliwack (Dolly Varden) Creek with the intention of continuing down the Chilliwack to the boundary, but snow having begun to fall and the route being without trails, the party turned back.

Work in the mountains was discontinued on October 1, and the pack train, in charge of the assistant geologist, was started on the return trip to winter quarters

at Ellensburg, Washington.

Boundary operations were continued by the chief of party from the towns of Sumas and Blaine, Washington. At Sumas he found the western Canadian party cutting vista along the line. After a conference with the chief of the Canadian party he continued to the shore of Semiahmoo Bay, the western limit of the work assigned to him, and completed his season's work by examining Monuments 5, 6, and 7 on October 5.

The personnel of the first United States geologic party was: Chief of party, George Otis Smith; assistant, Frank C. Calkins; and four hands.

SECOND UNITED STATES GEOLOGIC PARTY—WEST CROSSING OF THE KOOTENAL RIVER TO OSOYOOS LAKE

The second United States geologic party was organized at Bonners Ferry, Idaho, on June 20. The party consisted of five men with eleven pack horses.

From Bonners Ferry the party proceeded to Porthill, Idaho, on the east bank of the Kootenai River immediately south of the boundary. The Kootenai was in flood and had overflowed the valley to a width of three miles. The crossing of the stream was difficult, but was effected by means of a small scow and two rowboats. The transfer of the party to the west bank of the river was accomplished on June 24 and camp was made on the boundary near the mouth of Boundary Creek. Three days were spent in this camp doing such work as an almost continuous rain would permit. Among other things accomplished was the recovery of boundary cairn 139 (now Monument 206).

The party then moved up Boundary Creek over the Continental Mine trail. After devoting a day to visiting the Continental Mine on the head of Blue Joe Creek they continued on to Summit Lake at the head of Boundary Creek, which was reached on June 30. Six days, during which rain and snow continued to fall, were spent here in making geologic observations and studying the country for practicable routes of travel. The party then turned northward, following the old Copper Camp trail, and traveled through slush and mire and the previous winter's snows to the old Dewdney Trail on Summit Creek. This old trail, well laid out and once well traveled, though now long in disuse and in bad condition, provided the best

route for travel westward. It was followed up Summit Creek, across the divide, and thence down Lost Creek for 8 or 10 miles to a point from which the party made its way by other trails out to the railroad at Salmo, British Columbia. From Salmo, the party made an excursion to the South Fork of Salmon River and carried on an unsuccessful search for the boundary cairn (now Monument 193) on the west side of that stream.

On July 17 the party crossed Salmon River by swimming the horses near the mouth of South Fork and passed down Salmon River to its junction with Clark Fork (Pend-d'Oreille) River where camp was made for a few days. From this camp and from another at Sullivan Lake east of Metaline, Washington, quite an extensive geologic reconnaissance was carried on and the boundary cairn (now Monument 188) on the east bank of Clark Fork ¹⁰ was recovered.

The party then continued westward. Swimming their horses across Clark Fork at Metaline they went to Northport, Washington, on the Columbia River and made camp nearby. From this camp the greater part of the basin of Sheep Creek and the boundary across it and east to the Columbia River were reconnoitered. Boundary cairns now replaced by Monuments 171, 174, 179, and 180 were found.

On August 5 the party moved down the Columbia to Marble Ferry, Washington, and thence westward to Flat Creek. From that point the country was much more open than to the east and was well traversed by roads and trails. The party moved with comparative ease and rapidity. They worked westward to Pierre Lake, thence up the Kettle River through Laurier, Washington; Cascade and Grand Forks, British Columbia; and Danville and Curlew, Washington, to the mouth of Toroda Creek. From Toroda Creek the route was through Chesaw and Molson, Washington, to Oroville, Washington, at the foot of Osoyoos Lake. Work was concluded at Oroville early in September and the pack train in charge of the assistant was sent back over open and traveled roads to Bonners Ferry, Idaho, where the party was disbanded on September 27.

The personnel of the second United States geologic party was: Chief of party, F. L. Ransome; assistant, W. J. Sinclair; and three hands.

THIRD UNITED STATES GEOLOGIC PARTY—KOOTENAI RIVER AT PORTHILL, IDAHO, TO SUMMIT OF THE ROCKY MOUNTAINS

The third United States geologic party was organized at Blackfoot, Montana, on June 20. It started out with six men and eighteen pack animals. From the time of its organization until August 10 it was engaged in a general geologic reconnaissance westward from Blackfoot across the summit of the Rocky Mountains to Lake McDonald, thus covering an area not directly related to the examination of the boundary.

Leaving Lake McDonald the party crossed the Flathead River and thence traveled up that stream to the mouth of Kintla Creek. Several geologic excursions were made in this vicinity, and on August 24 the party was in camp on the west bank

¹⁰ Clark Fork is the name authorized by the United States Board on Geographical Names. Pend-d'Oreille is the name authorized by the Geographic Board of Canada.

of the Flathead opposite the mouth of Kishenehn Creek. Leaving the main outfit here an excursion was made up the Kintla Lakes to the main divide of the Rocky Mountains to seek the boundary cairn marking the summit of the Rocky Mountains (now Monument 272), and to extend the geologic study of the region. In view of the ruggedness of the main divide and its difficulty of access in many places, a topographic survey was carried forward by plane-table triangulation to assist in locating the boundary cairn on the crest of the divide. By this means, the cairn was readily found. Upon the return of the party to the Flathead River, an excursion was made on September 2 to the two boundary cairns (now Monuments 265 and 266) on Kishenehn Creek and to the two cairns (now Monuments 261 and 262) on the Flathead River. The cairns were all found in good condition.

The party then proceeded by way of the Grave Creek trail—a route considerably to the south of the boundary—to Tobacco Plains (near Gateway), Montana, passing by that part of the boundary examined by the astronomic and topographic parties.

At Tobacco Plains the party was reduced in number and in equipment in preparation for traveling "light" through the heavily timbered mountains lying in the loop of the Kootenai River between Tobacco Plains and Porthill. The two assistants were detached from the party. Eight of the animals and a large part of the camp outfit were disposed of.

On September 11 the party thus reduced in size and equipment crossed the Kootenai River, using a small skiff for men and outfit and swimming the horses, and after a day spent in reconnoitering, followed the "Dodd Creek (now Young Creek) trail" across the Purcell Range to the East Fork of Yaak River. From the Yaak River camp the boundary on the North Fork of Yaak River was reached and boundary cairns now marked by Monuments 232, 233, and 234 were found.

Camp was then moved down the East Fork, over a trail the packers of the party had cut, to a point about one mile below the junction of the East Fork with the North Fork of the Yaak. From here it was intended to reconnoiter the Yaak Range lying between the Yaak and Moyie Rivers, but travel with a pack train through these mountains was found to be so difficult that the original plan was abandoned. The pack train and main party were sent south over known trails to the railroad at Libby, Montana, while the chief of party with one man and a light camp outfit made his way across the range to the Moyie River in the vicinity of the boundary. In the Moyie Valley an extended but unsuccessful search was made for the boundary cairns marking the crossing of the river. The chief of party then followed the Canadian Pacific Railway from the Moyie Valley to Kitchener, British Columbia, and thence proceeded to Porthill, Idaho, by way of Creston, British Columbia.

Porthill was the western limit of the work assigned to the party and an inspection there of the boundary cairn on the east side of the Kootenai River (now Monument 207) completed the work of the season. The party disbanded at Bonners Ferry, Idaho, on September 22.

The personnel of the third United States geologic party was: Chief of party, Bailey Willis: assistants, Stewart Weller, George I. Finlay; and three hands.

SEASON OF 1902—RECONNAISSANCE WEST OF THE ROCKY MOUNTAINS

The western and the eastern Canadian parties engaged in the reconnaissance of the boundary west of the Rocky Mountains in 1901 were compelled to discontinue work by the onset of wintry weather before they fully completed their assignments. In the spring of 1902 both parties returned to the field and began work where it had been discontinued the previous season. These were the only parties on this part of the boundary in 1902.

Western Canadian Party—Point Roberts

In May 1902, Mr. J. J. McArthur, D. L. S., opened up the vista along the boundary across Point Roberts from Monument 1 to Monument 4, and did some topographic work in the vicinity. This completed the work left unfinished by the western Canadian party in 1901.

Eastern Canadian Party—Similkameen River to South Fork of Salmon River

The eastern Canadian party of 1902 was organized at Greenwood, British Columbia, on June 1. It consisted of 19 men with a pack train of 15 horses.

As soon as organization was completed the party moved to Midway, British Columbia, and worked west to the Similkameen River over a section of the line covered the season before. Additional and check observations were made and the topography supplemented along the boundary within this distance. Upon the completion of this work the party moved to Cascade, British Columbia, and made a phototopographic survey from boundary cairn 120 to boundary cairn 127 (now Monuments 166 and 174), which work they had been prevented from doing in 1901 by dense smoke from forest fires. The boundary mark designated as No. 126 (now Monument 172) could not be found. The report of Lieutenant Colonel Hawkins, Her Britannic Majesty's Commissioner in 1858–1869, describes this monument as being built of logs, as no stone could be found within a long distance of the line. The log monument had been destroyed by forest fires but charred stumps in the old vista were still in evidence.

From boundary cairn 127 (now Monument 174) operations were continued east-ward across the Columbia River to the South Fork of Salmon River. On this section of the line as far as the Columbia River, the chords of the parallel were run out between the boundary monuments, and vistas cut across the summits of the intervening ridges. Across the valley of Little Sheep Creek, occupied by settlements of railway and of mining interests, the line was cleared continuously. A phototopographic survey was carried on along the line and a small scheme of triangulation executed to locate the camera stations. All of the boundary cairns were found as far east as the Columbia River with the exception of cairn 131 (now Monument 180) on the west bank of the Columbia. The remains of this cairn had been identified by United States parties in 1901.

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East of the Columbia River, the theoretical chord was run from the iron post set by the United States astronomic party in 1901 at the approximate site of the missing boundary cairn, No. 133, on the east bank of the Columbia toward boundary cairn 134 (now Monument 186). Though cairn 134 was not found, it was determined that the chord fell approximately 150 feet to the north of its position, as indicated by the old vista which was still visible to the east. A theoretical chord was run from boundary cairn 136 (now Monument 188) on the east bank of the Pendd'Oreille River (Clark Fork) toward boundary mark 137 (a bench mark cut in the face of the rock, now marked by Monument 192) on the ridge west of the South Fork of Salmon River. This fell 476 feet to the north of the mark. These chords were cleared of timber across the summits of the high ridges only.

The operations of the eastern Canadian party, just described, concluded the field work of the season and also completed the reconnaissance jointly undertaken by the two Governments.

The party quit the field on October 25.

The personnel of the eastern Canadian party was: Chief of party, W. F. O'Hara, D. L. S.; assistants, J. M. Bates, T. A. Davies, J. M. Sheppard; naturalist, J. M. Macoun; assistant naturalist, Wm. Spreadborough; geologist, R. A. Daly; and 12 hands.

SEASON OF 1903—SOUTH FORK OF SALMON RIVER TO THE SUMMIT OF THE ROCKY MOUNTAINS

The field operations of 1903 constituted the first work on this part of the boundary under concurrent action of the Government of the United States and the Government of Great Britain taken in 1902 and 1903. The work to be undertaken this season was no longer a reconnaissance; it was the beginning of the complete survey, retracement, and remonumenting of the boundary along the 49th parallel of north latitude from the summit of the Rocky Mountains westward to the eastern shore of the "Gulf of Georgia."

As in all subsequent operations, the work was conducted by separate field parties of each Government and was directed by Commissioners appointed by the two Governments to act jointly. There were three parties in the field in 1903: a Canadian party assigned to work on the section of the line from the crossing of the Kettle River near Laurier, Washington, and Cascade, British Columbia, to the crossing of the Kootenai River at Porthill, Idaho; and two United States parties, one specializing in astronomic and geodetic work and one specializing in topographic mapping, both assigned to work on the boundary from the crossing of the Kootenai River at Porthill, Idaho, to the summit of the Rocky Mountains.

CANADIAN PARTY—WEST OF PORTHILL, IDAHO

The Canadian party of 1903 was assembled at Rossland, British Columbia, on June 2. It consisted of 23 men and was provided for field transportation with the 15 head of pack horses left at the Charbonneau Ranch the previous autumn by the eastern Canadian party. Men and equipment were moved by train and boat over

the Canadian Pacific lines of transportation to Creston, British Columbia, and thence, using their own horses, by trail to Porthill, Idaho, to begin work on the eastern end of the section of the boundary assigned to them.

At Porthill a preliminary datum from which to expand triangulation and line projection was established by measuring a broken base nearly 2 miles in length along the railroad track in the vicinity of boundary cairn 140 (now Monument 207). straight line connecting the intervisible ends of the base was computed and its azimuth carefully determined by astronomic observations. Boundary cairns 139 (now Monument 206) and 140 (now Monument 207) were trigonometrically connected with the base and the azimuth and distance between them computed.

As the work progressed it became necessary to cross the Kootenai and penetrate the high and heavily timbered mountain country west of the river. The Kootenai was in spring flood from the melting snow in the mountains and spread across its low and swampy bottom lands to a width of more than 3 miles. Difficult crossings of the river were made by means of rowboats and scows. A wagon road which had been built by mining interests from Porthill up Boundary Creek crossed and recrossed the boundary for some 15 miles and then led up Blue Joe Creek to the Continental Mine. It had been expected that this road could be made use of by the party, but high water of the season before had carried out all the bridges and made much of the road impassable. Old pack trails had to be reopened and new ones cut and in many places graded. As the party progressed farther west, trail building had to be continued in advance of its movements during the entire season.

After crossing the Kootenai, the party took up the work of projecting the line westward from boundary cairn 139 (now Monument 206) to cairn 138 (now Monument 193) at the crossing of the South Fork of Salmon River. The unsurveyed distance between these marks was about 25 miles over very mountainous and heavily wooded country. It was decided to connect the marks by triangulation and to then compute the azimuth and distance between them. The necessary triangulation was carried forward from the base previously measured at Porthill, and upon its completion the computed chord between the two monuments was run from each end simultaneously to a meeting point on the high summit of Big Snowy Mountain. So carefully had this work been done that the discrepancy at the place of meeting was but 0.559 meter. Corrections were computed from the observed discrepancy for the transit stations and so applied as to give the true location of the boundary line.

After the true line had been determined, vista cutting was begun and carried on as other work and the weather permitted.

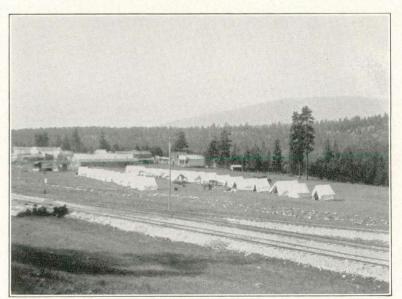
A phototopographic survey controlled by the triangulation was carried on during the progress of the work.

The operations of the party were very much hindered throughout the season by inclement weather. Out of 110 days in the field there were 46 days of rain or snow. By the 21st of September weather conditions had become so unfavorable that operations were suspended for the season. The main party came out of the mountains by way of Porthill and Creston while an assistant with the packers took the horses westward over the high summit through deep snow back to the Charbonneau Ranch on the Pend-d'Oreille (Clark Fork) River for winter quarters.

The personnel of the Canadian party was: Chief of party, W. F. O'Hara, D. L. S.; assistants, J. M. Bates, E. T. de Coeli, T. A. Davies, W. M. Tobey, J. M. Sheppard; naturalist, J. M. Macoun; assistant naturalist, Wm. Spreadborough; geologist, R. A. Daly; and 14 hands.

United States Parties

The two United States parties in 1903 were organized at Gateway, Montana, early in June. It had been planned that there should be two major United States parties in the field, one under the direction of a chief of party whose designation was Chief Astronomer, the other under the direction of a Chief Topographer. While each of these parties was engaged much of the time in the retracement of the boundary, cutting vista, and in doing other than astronomic or topographic work, for the



ORGANIZATION CAMP OF THE BOUNDARY SURVEY AT GATEWAY, MONTANA,

sake of identity they were known as the astronomic party and the topographic party.

The magnitude of the undertaking made it plain to the chiefs of party that field work would have to be carried on for several seasons by large organizations, and therefore it would be advantageous to equip the parties at the outset in a permanent manner. Accordingly, horses and saddles, instruments, tools, tents, and other camp requirements were all purchased outright.

The plans for the season provided for a total working force of about 80 hands and an equal number of horses. The purchase and shipment to Gateway of the necessary equipment for this organization was attended to by the chiefs of party and their assistants. The horses were bought locally. Many of the horses were fresh from the range and had to be broken to be ridden and to pack. The gathering together of equipment, employment of hands, setting up of camp, breaking, branding, and shoeing of horses, etc., fully occupied the first two weeks in June. The organization when completed was divided into the two main parties and they in turn into subparties for the various kinds of work on assigned sections of the line.

ASTRONOMIC PARTY

The United States astronomic party in 1903 was divided at the beginning of the season into three subparties, each directed by an assistant, and all three under the supervision of the chief astronomer. The first subparty was assigned to triangulation and geodesy, the second to vista cutting, and the third to trail building, line projection, and vista cutting.

FIRST ASTRONOMIC SUBPARTY

The first and second astronomic subparties left Gateway on June 23 and moved east to Phillipps Creek Pass to take up work on the 13-mile chord between boundary cairn 154 (now Monument 247) on Phillipps Creek and boundary cairn 155 (now Monument 254) on Wigwam River.

This section of the boundary had been surveyed and temporarily marked, on the curve of the parallel between the two boundary cairns, in 1901, through an error in judgment as to the force of the agreement of the Commission of 1857–69 that the boundary line between consecutive monuments irrespective of distance should be the chord or straight line. It was necessary, therefore, now to cut out and mark this line on the chord to conform to the original agreement. The first subparty proceeded to lay out the line on the chord, leaving it to the second subparty to take up the clearing of the vista.

After having established the chord, the first subparty took up the work of triangulation along the boundary. As they were already in the mountains east of Gateway, they began the selection of stations and building of signals east of Wigwam River and worked westward to Phillipps Creek. The party's attention was then turned to the selection of a site for and the measurement of a base. A tangent on the Great Northern Railway track just south of Gateway was selected and a base 1,226 meters in length was measured on July 30 by standard methods. The base was expanded to the stations of the triangulation scheme. Operations were then transferred to the boundary west of the Kootenai River.

The Purcell Range west of the Kootenai is so heavily timbered that travel is almost impossible without trails. The mountains, timbered to their tops, have to be cleared or lines of sight opened before they can be used as triangulation stations. Under such conditions, progress was exceedingly slow through this region.

Reconnaissance and observing of triangulation were carried westward nearly to Porthill, Idaho, at the western crossing of the Kootenai River. A little to the east of Porthill the United States Geological Survey stations "Ewing" and "Hell Roaring" were incorporated into the scheme for the purpose of making a connection with the geodetic datum of the "Spokane base."

About the end of October the party returned east and attempted to establish an additional station about 10 miles northwest of Gateway, in order to strengthen the triangulation scheme by making better conditioned triangles.

The station was selected and named "Kootenai", but before it could be cleared and made ready for observing, a snowstorm began and continued so long that further work for the season had to be abandoned. The party returned to Gateway where it was disbanded on November 20.

SECOND ASTRONOMIC SUBPARTY

The second astronomic subparty left Gateway in company with the first astronomic subparty on June 23 and moved to Phillipps Creek Pass in the vicinity of the boundary. The first astronomic subparty established the chord between the Phillipps Creek boundary cairn, No. 154 (now Monument 247), and the Wigwam

cairn, No. 155 (now Monument 254), as just related in the record of their operations. While that work had been going on, the second subparty had assisted the first subparty. Upon its completion, the second subparty started opening a 20-foot sky-line vista along the chord.

Along this 13-mile chord, the country is heavily timbered. In order to keep the party within working distance of the boundary and keep it supplied by the pack train it was necessary to build about 18 miles of main and side trails. Trail building and vista cutting each entailed much heavy labor and kept the party busy until the 5th of September. A stadia line had been run over this section of the boundary in 1901 and, while it had been run on the curve of the parallel between the two original monuments as laid out at that time, it was found to be practicable to transfer distances and elevations from it to the line now established on the chord.

The vista cutting having been finished on this chord, the party moved west across the Kootenai to the Yaak River over trails cut earlier in the season by the third astronomic subparty. Here lay the 24-mile chord between boundary cairn 146 (now Monument 231) on the west side of the Yaak River and boundary cairns 144 and 145 (now Monuments 217 and 218) which were approximately 100 feet apart on the east bank of the Moyie River.

The chief astronomer joined the camp here and personally supervised the work of projecting the chord between the two original boundary cairns. In the meantime one of the topographic subparties began the projection of the chord from the west end at the Moyie River. The two parties met with their lines on one of the high intervening summits. The necessary corrections were then made to the trial line to establish the true chord.

When the direction of the true chord had been determined, the second astronomic subparty began clearing the vista and running a stadia traverse over it. Work was continued until stopped during the first week in November by snowstorms which continued from day to day until by November 18, the snow was more than 2 feet deep. The party then moved out to Yahk Siding on the Canadian Pacific Railway and thence went by train to Gateway, where it was disbanded on November 21.

THIRD ASTRONOMIC SUBPARTY

The third astronomic subparty crossed the Kootenai River at Gateway, Montana, on June 24 and 25 to open a trial line across the intervening summits for the 17 miles between boundary cairn 151 (now Monument 241) on the west side of the Kootenai River and boundary cairn 149 (now Monument 234) on the east side of the Yaak River. The spring freshets from the melting snow of the mountains were extremely high this year. The Kootenai is a large stream and was not only at flood stage but its waters were carrying an unusual amount of driftwood, logs, and whole trees torn from the banks of the river and of its swift-flowing tributaries. There was no bridge across the river and no ferryboat at this time, though later in the season a ferryboat was put on, much to the convenience of the survey. The crossing of the party with its supplies and outfit had to be undertaken with rowboats. It was necessary to swim the horses led behind the boats. The whole operation of crossing was

extremely dangerous, and in spite of every precaution, two of the horses were drowned.

As soon as the exciting work of crossing the Kootenai and establishing a camp had been completed, the trial line at boundary cairn 151¹¹ (now Monument 241) was started. The chief astronomer observed on Polaris for an azimuth on the nights of June 28 and 29. From the determined azimuth he started the trial line to the west in the theoretical direction of the chord. The assistant in charge of the party then took over the work and continued the line from summit to summit to its terminus at boundary cairn 149 (now Monument 234).

The country across which this chord passes is extremely rough and is covered with a forest growth of great size and density. Trails ahead of the party had to be laboriously built as the trial line progressed westward.

Upon the completion of the trial line, the proper corrections were laid off on the intervening summits to mark the true chord. The clearing of the vista and the running of a stadia traverse along the chord was then begun and was continued to completion, in the latter part of October.

The party returned to Gateway on November 2 and proceeded from there over the Canadian Pacific Railway to Yahk Siding. From the latter place it moved by pack train to the boundary line on the East Fork of Hawkins Creek and began cutting vista on the chord between the Yaak and Moyie Rivers, between the second astronomic subparty and a topographic subparty already engaged along this chord.

The party had scarcely begun work and had cut but three-fourths mile of vista and about 1 mile of trail when the early and deep snow of the season compelled it to cease operations. After waiting for several days in the hope that weather conditions might improve, the party moved out to Yahk Siding, where the hands were paid off and the camp outfit and pack train shipped to Gateway, Montana.

The personnel of the United States astronomic party was: Chief of party, C. H. Sinclair, Chief Astronomer; assistant in charge of first subparty, John Nelson; assistants in charge of second subparty, Reinert Hanssen, first half of season, and F. A. Camp, second half of season; assistant in charge of third subparty, E. R. Martin; and about 40 hands divided among the subparties as required.

TOPOGRAPHIC PARTY

The United States topographic party in 1903 was divided at the beginning of the season into four subparties, each directed by an assistant and all four under the supervision of the chief topographer. The first and second subparties were assigned to the retracement of the boundary, vista cutting, and topographic surveys. The third subparty was employed throughout the season on topographic surveys, and the fourth subparty in running levels.

The first topographic subparty was assigned at the beginning of the season to the section of the boundary between the Flathead River and the summit of the Rocky Mountains. The second subparty was directed to take up work between

¹¹ Boundary cairn 150 was never found and the conclusion was reached that it had never been built.



ORIGINAL BOUNDARY CAIRN 161 ON THE SUMMIT OF THE ROCKY MOUNTAINS, NOW REPLACED BY MONUMENT 272. CAIRN ERECTED IN 1861, PHOTOGRAPHED IN 1903

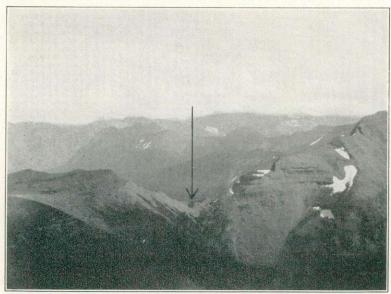
the Wigwam and Flathead Rivers. These two parties, consisting jointly of 20 men with 28 pack horses, left Gateway together on June 17 over the Grave Creek trail for the Flathead Valley. They were the first of the season to travel the trail and encountered many difficulties. The trail was blocked by many windfalls which had to be removed by axmen traveling in advance of the pack train. On the summit of the Galton Range, several miles of snow fields were encountered over which a route had to be picked where the

snow was solid enough to bear the weight of the horses. Heavy rain fell continuously on the day the high summit of the range was crossed. These difficulties and hazards were overcome only by dint of hard work and perseverance. The parties reached the Flathead Valley at the end of the fourth day and went into camp on the west bank of the river about 8 miles below the boundary crossing. Here the parties separated to take up their assigned work.

FIRST TOPOGRAPHIC SUBPARTY

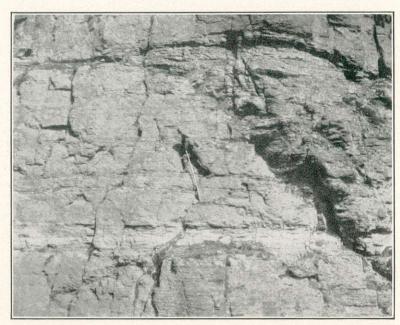
At the outset the first topographic subparty was confronted with the necessity

of crossing the swollen waters of the Flathead. In anticipation of high water, the chief topographer had sent three men up the river from Belton, Montana, with lumber and tools to build a small rowboat and with instructions to await the arrival of the parties at the trail crossing. The men and the boat were found waiting as expected. A raft was constructed of dry logs and loaded with equipment and supplies and then hauled across by a rope passed across the river by boat.



THE SUMMIT OF THE ROCKY MOUNTAINS. THE ARROW POINTS TO BOUNDARY MONUMENT 272 IN THE SADDLE IN THE FOREGROUND

After several attempts to force the horses into the stream had failed, they were led upstream to a high bank where they could be shoved over the bank into deep water and compelled to swim. The bell mare, with a rope from across the river attached to her halter, was first shoved over the bank and dragged to a safe landing place on the opposite shore. Guided by her whinnying and the sound of the bell, the other animals swam to her as they were in turn shoved into the water.



A DIFFICULT CLIMB TO "KINTLA" TRIANGULATION STATION, ROCKY MOUNTAINS. COMMISSIONER RIGGS AS A YOUNG SURVEYOR IN 1903

In this manner the crossing was effected in safety.

To meet the needs of both parties, a supply depot was established on the east side of the river and a man placed in charge. A combined pack- and wagon-train line of transportation from Belton, Montana, kept the depot stocked.

Before taking up their separate activities, the chiefs of the two subparties measured with a steel tape a preliminary base in the valley, from which to start



CLIMBING TO A TRIANGULATION STATION IN THE ROCKY MOUNTAINS

topographic work in the absence of more suitable control. A preliminary azimuth of the base was determined by solar observations.

The first subparty began line work on the chord between boundary cairn 159 (now Monument 265) on the west side of Kishenehn Creek and boundary cairn 158 (now Monument 262) on the east side of the Flathead River. As soon as this chord had been located, vista cutting and stadia traverse along it were begun by the transitman of the party.

The engineer in charge then took up the work of projecting the true line or chord between boundary cairn 160 (now Monument 266) on the east bank of Kishenehn Creek and boundary cairn 161 (now Monument 272) on the summit of the Rocky Mountains. This proved to be a difficult undertaking as the line passes along the almost perpendicular slope near the top of the highest peak of the Sawtooth or Boundary Mountains. This particular peak is approximately 9,400 feet in elevation and is 5,300 feet above the monument on Kishenehn Creek. In order to reach the point where the boundary crosses, the men had to work their way over snow slides and up the faces of cliffs where a slip or a misstep would precipitate them hundreds of feet down almost perpendicular mountain walls. Several attempts were made to scale the mountain before a signal was successfully placed on line.

When boundary location work had been completed, the engineer in charge took up triangulation, for topographic control, and the boundary mapping. In charge of the transitman, vista cutting and stadia traverse were carried on along the timbered portions. The stadia traverse had to be abandoned on the steep slopes of the Boundary Mountains, as the inclinations were so great that much of the line was inaccessible. All work on the section of boundary between the Flathead River and the summit of the Rocky Mountains was completed on August 18.

The first subparty then moved back over the Grave Creek trail to Gateway. On August 24 the party left Gateway by railroad with a carload of horses, outfit, and a month's supplies, for Goatfell, British Columbia. The stock car was delayed on the way by a washout on the railway and did not arrive at Goatfell until September 1. The party immediately moved 12 miles to the boundary line near boundary cairn 141 (now Monument 213) on the Moyie trail. After cutting a vista to the east to the summit of Border Mountain, it was discovered that boundary cairn 141 was only approximately on the parallel, ¹² and pending the settlement of the question as to whether the boundary cairn should be accepted as a point on the boundary, the vista cutting at this place was discontinued.

The party then projected a 40-mile continuous random line through triangulation station "Border", which was conveniently located about 80 meters north of the boundary, between boundary cairn 140 (now Monument 207), on the east side of the Kootenai River at Porthill, and boundary cairn 146 (now Monument 231), on the west side of the Yaak River; and by the method of offsets from the random line established the true chords between the consecutive boundary cairns. Vista cutting was resumed by the transitman of the party in the vicinity of Mission Creek, and the vista-cutting crew of the second topographic subparty was put to work on the east side of the Moyie River.

After completing the retracement of the boundary from Porthill to the Yaak River, the chief of the subparty turned his attention to topographic mapping between the Yaak River and Hawkins Creek to the west. He completed the topography about November 1. For the few remaining days of the season he directed the vista-cutting crews.

¹² This monument had been located by the original Commission by running a traverse from the Moyie River station around the north base of Border Mountain, a distance of 5 or 6 miles, and a small error in latitude resulted from the accumulated errors of the traverse.

On November 6 snow began to fall and continued for several days, covering the ground to a depth of more than a foot in the valleys and to a greater depth on the mountains. The weather turned cold, the temperature dropping to 15° below zero, Fahrenheit. But little progress could be made under these conditions and the party disbanded on November 14.

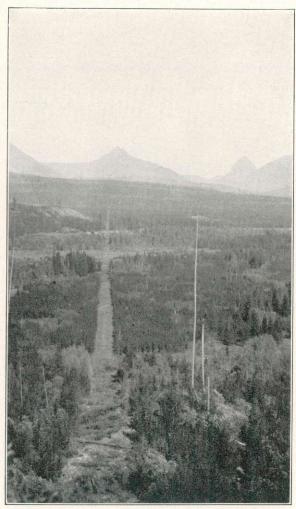
SECOND TOPOGRAPHIC SUBPARTY

The second topographic subparty separated from the first topographic subparty at the trail crossing of the Flathead River late in June. A trail was built for 8

miles up the west side of the river and camp moved over it to the boundary near boundary cairn 157 (now Monument 261). From the Flathead River to the Wigwam River, the boundary passes over a summit 4,000 feet above the valley. The country was densely wooded and without trails. The transitman with a crew of axmen immediately began opening a trail to serve the needs of the party as it worked westward. The engineer in charge projected and established the true line or chord between boundary cairn 157 (now Monument 261) and boundary cairn 156 (now Monument 255.)

As soon as the boundary line was located, vista cutting and the running of a stadia traverse along it were begun by the transitman, while the engineer in charge began the topographic mapping and triangulation. All of these operations were continued, without special incident, to completion at the Wigwam River on September 14.

Upon completion of work on this section of the boundary, the party moved by trail to Gateway. From Gateway the party moved westward to Yahk Siding, British Columbia, by train and thence to the boundary. The axmen were trans-



THE BOUNDARY VISTA, LOOKING EAST ACROSS THE FLATHEAD RIVER VALLEY

ferred to a new vista-cutting party to work east of the Moyie River under the supervision of the first topographic subparty. The engineer in charge of the second topographic subparty with a small crew took up topographic work extending from about 10 miles east of the Moyie River westward to Porthill where, in conjunction with the third topographic subparty, he closed up the last gap in the mapping from

the summit of the Rocky Mountains to the west crossing of the Kootenai River. After finishing the mapping, he organized a vista-cutting party near Porthill. It then being November 1, little was accomplished before early snows and cold weather forced the party to suspend operations for the season, on November 15.

THIRD TOPOGRAPHIC SUBPARTY

To the third topographic subparty was assigned the topographic mapping along the sections of boundary retraced by the astronomic subparties, and work was begun at Gateway. The section of the boundary between the Kootenai River at Gateway and the Wigwam River had been mapped by the United States reconnaissance party of 1901. As this work was accepted after a small amount of checking and revision, practically all of the work of the third topographic subparty lay west of the Kootenai River.

The party measured a preliminary base at Gateway and expanded from it instrumentally to suitable points available for plane-table control until the astronomic party would be able to furnish final control data. The plane table, supple-

mented by stadia traverse, was then used for the actual mapping.

The topography immediately west of Gateway consists, for about 4 miles, of low, rolling hills covered with a dense growth of timber. Continuing westward, these timbered hills rise gradually in height for about 6 miles and then abruptly rise to the crest of the Purcell Range. This region had to be mapped almost entirely by stadia traverse for which many miles of line had to be cut through the underbrush, making the work slow and tedious. West of the Purcell summit the character of the country is more bold, and though mostly timbered was more easily mapped. In all of this heavily timbered country all work had to be done on foot. No horses were kept for party use. Camp was moved and supplies were brought in by the pack trains of the astronomic party working in the same area.

Topographic mapping was carried on as far west as the Yaak River where a junction was made with the work of the first topographic subparty, on October 21. The party then moved to Porthill, Idaho, and assisted the second topographic subparty in completing the mapping of the section of the line assigned to the United States parties in 1903. Having completed its mission, the party was disbanded on

November 4.

FOURTH TOPOGRAPHIC SUBPARTY—LEVELING

The fourth topographic subparty or level party left Gateway on June 15, going by rail to Belton, Montana. There they spent a few days assisting the chief topographer in hiring and organizing transportation to supply the parties about to begin work on the Flathead River. This attended to, the party took up the operations to which it had been assigned.

Beginning at a United States Geological Survey bench mark at Round Prairie on the Flathead River, at the end of an unchecked line from Belton, the party ran a level line to the boundary on the Flathead River, ran spur lines to Kintla, Bowman, Quartz, and Logging Lakes, and checked the line back to a checked bench mark of the United States Geological Survey at Belton. The spur lines, except the one to

Kintla Lake, were run for the use of the United States Geological Survey, and reimbursement for the work was made by that Survey. Permanent and temporary bench marks were set along the line and at its terminus. While at work in the Flathead Valley, the party lived in camp and was transported by a hired pack train.

The level work in the Flathead Valley having been completed, the party moved to Rexford, Montana, and ran a checked line of levels from there to Gateway, Montana. The datum for this line was a Great Northern Railway bench mark established by a checked line of railroad levels from Columbia Falls, Montana, and referred to the United States Geological Survey datum at that place. While so occupied the party lived at hotels and ranch houses.

The level party completed its work on the 25th of October and was transferred to the chief astronomer. A trip was made to the Flathead River for magnetic observations on the boundary at that place. The return trip to Gateway had to be hastened to keep from being blockaded in the mountain ranges by the snow which began to fall early in November. Upon reaching Gateway, observations were made at two stations nearby. By this time the snow had become so deep that it was useless to attempt further work and the party was disbanded on November 20.

The personnel of the United States topographic party was: Chief of party, E. C. Barnard, Chief Topographer; assistant in charge of first subparty, D. L. Reaburn; assistant in charge of second subparty, J. G. Hefty; assistant in charge of third subparty, Sewell Truax; assistant in charge of fourth subparty, A. E. Franklin; transitmen, C. A. Holden, E. H. Loder, H. F. Burkhart; and about 40 hands.

SEASON OF 1904—SKAGIT RIVER TO THE SUMMIT OF THE ROCKY MOUNTAINS

The field operations of 1904 were a continuation of the work of the previous season. The number and organization of the field parties differed but little, the Canadians employing one main party and the United States two main parties as during the previous season. The Canadian party, however, was considerably augmented in size. The Canadian party continued work on the section of the boundary from the Kettle River near Laurier, Washington, and Cascade, British Columbia, to the crossing of the Kootenai River at Porthill, Idaho. The United States parties continued work on the section of the line from the crossing of the Kootenai River at Porthill, Idaho, to the summit of the Rocky Mountains; carried on triangulation and other work between the Similkameen River and the most eastern crossing of the Kettle River near Laurier, Washington; and did the major part of the field work on the section of line, assigned to United States parties, between the Skagit and Similkameen Rivers.

CANADIAN PARTY

The Canadian party of 1904 was organized at Porthill, Idaho, during the first week in May. It consisted of 34 men and was provided with 33 head of pack horses. Twenty-one of the pack horses were purchased locally at the time of organization and were immediately available. The remainder of the horses had been used the

previous season and wintered at the Charbonneau Ranch on the Pend-d'Oreille (Clark Fork) River. These were brought across the mountains as soon as the melting snows permitted and arrived at Porthill about June 1. At the time of organization the Kootenai River was in its annual spring flood and the crossing of the river with outfit and supplies to reach the west side presented the usual difficulties. The animals were made to swim and wade the three miles across the flooded valley while outfit and supplies were ferried across in small boats. For efficiency, the party was divided into two general divisions, one for triangulation and the other for line projection, vista cutting, trail building, and phototopography. Each of these main divisions was divided from time to time into smaller crews.

The triangulation party was made up of two self-dependent units, one for reconnaissance and signal building and one for observing. Triangulation was begun at stations "Hell Roaring" and "Hawkins" of the United States party and carried westward through stations on each side of the boundary.

The difficulties of travel through the high and heavily timbered mountains, the rains and bad weather of the early part of the season, and smoke from forest fires in the latter part of the season combined to make the progress of the triangulation very slow. Weather conditions became so unfavorable about the middle of October that the triangulation was suspended for the season before a junction, as planned, could be made with the work of the United States parties at stations "Buck" and "Horn" near the eastern crossing of the Kettle River.

After the suspension of triangulation, the party spent some time before disbanding in measuring the deflection angles of the boundary at the original cairns or monuments between the Columbia River and the most eastern crossing of the Kettle River.

The line-work division of the party began operations with a vista-cutting crew of 16 axmen on May 12 at original boundary cairn 139 (now Monument 206). This crew worked west along the 25-mile chord which had been established the previous season and upon which the vista had been cut only on two short sections.

As the vista cutting proceeded westward twelve intermediate monument sites were selected and marked, and horse trails were cut, over which monuments and material for their bases might be transported from the main trail. The work on this chord was completed on July 10. Three days later the short line, 0.7 mile, between original cairns 137 and 138 (now Monuments 192 and 193) had been cleared and a start made on the 9-mile chord to original cairn 136 (now Monument 188) at Pend-d'Oreille (Clark Fork) River. In order to keep near the work it was necessary to cut a trail along the boundary from the South Fork of the Salmon River to the Pend-d'Oreille. Trail cutting was slow work, the timber being thick and the windfalls heavy. Trail cutting, line projection, vista cutting, and selection and marking of monument sites on this chord were completed on August 10.

This brought the party to the crossing of the Pend-d'Oreille. The stream was too large and swift to ford and the only bridge available was the Great Northern Railway bridge at Waneta, British Columbia. The party moved down the river by trail and road to Waneta, crossed the horses over the railroad bridge by placing relays of plank on the ties ahead of them, and then moved up Cedar Creek over a

wagon road to the Fish Creek Gold Mine, which is about a mile south of the boundary and about 4 miles west of the crossing of the Pend-d'Oreille from which they had started. The party had traveled over 30 miles on this move in order to cross the river and advance a distance of but 4 miles.

From the Fish Creek Mine a trail was cut and camp moved to a point on the boundary about 2 miles west of original boundary cairn 134 (now Monument 186). Work on the 12-mile chord between the Pend-d'Oreille and Columbia Rivers was begun from this camp and carried on until completed on October 8. The chord crosses numerous high ridges and deep, heavily wooded ravines, which seriously retarded line projection and vista cutting along it.

Upon reaching the Columbia River, the party moved to Northport, Washington, where they were able to cross the Columbia on the railroad bridge by loading their horses and outfit into box cars and having the cars shunted across the bridge. Having crossed the river, the party moved by trail up the valley of Little Sheep Creek to Paterson Station on the Great Northern Railway, just north of the boundary. From there they worked westward.

In the meantime a small crew, under the direction of the topographic assistant, had been put to work, on August 25, on the interval of the boundary between the Columbia River and Paterson Station on Little Sheep Creek.

This part of the boundary had been retraced by the Canadian reconnaissance party in 1902. Phototopographic surveys had been made and much of the vista had been cut at that time. The crew now completed the vista, made line measurements, located intermediate monument sites, and made some needed additional phototopographic surveys. The work was completed early in September.

The topographic assistant then reduced the size of his crew by a half dozen axmen and returned to Waneta to complete the phototopographic surveys along the Pend-d'Oreille (Clark Fork) and Columbia Rivers.

Returning now to the account of the main line-work party at Paterson on Little Sheep Creek: the party worked westward along the boundary, widening the vista where it had been cut in 1902, opening it in valleys where it had not been cut, and locating and marking intermediate monument sites. The party completed this work to the most eastern crossing of the Kettle River on November 9.

By this time all the other units or crews had been disbanded. However, as the weather was still fine it was decided to continue work, and camp was moved to Midway, British Columbia. Here the widening of the vista of 1902 was begun to the westward from original boundary cairn 96 (now Monument 141). Operations had no more than been well started when the good weather broke, causing all work to be suspended for the season. The party was disbanded on November 13.

The personnel of the Canadian party was: Chief of party, J. J. McArthur, D. L. S.; assistant in charge of triangulation, Howell Bigger, D. L. S.; assistant in charge of line projection, Noel J. Ogilvie; assistant in charge of phototopography, T. A. Davies; other assistants, W. M. Tobey, J. N. Sheppard, E. T. de Coeli; and 27 hands.

UNITED STATES PARTIES

The United States forces engaged in field work in 1904 were, as in the previous season, divided into two main parties, one under the direction of the chief astronomer, called for convenience the astronomic party, the other, under the direction of the chief topographer, known as the topographic party. Each of these parties was in turn divided into subparties.

ASTRONOMIC PARTY

The United States astronomic party in 1904 undertook the work of completing the vista cutting and stadia surveys along the boundary in the vicinity of the Yaak River where work had been interrupted by the advent of winter the previous season; the locating and marking of the sites for intermediate monuments and the completion of the triangulation from the crossing of the Kootenai at Porthill to the summit of the Rocky Mountains; the execution of a belt of triangulation along the boundary from the most eastern crossing of the Kettle River westward to the crossing of the Similkameen River; and the setting of monuments.

In order to carry out these plans for work so widely separated as to character and locality, the party was divided into three subparties. The first subparty was to undertake the triangulation from the eastern crossing of the Kettle River to the crossing of the Similkameen River. The second subparty was assigned to locating and marking the intermediate monument sites and completing the triangulation on the line from the crossing of the Kootenai at Porthill, Idaho, to the summit of the Rocky Mountains, and to take part in the completion of the vista cutting and stadia traverse on the same section of the boundary. The third subparty was expected to cut vista, run stadia traverse, assist the other parties, and set monuments.

FIRST ASTRONOMIC SUBPARTY

The first astronomic subparty was organized at Kalispell, Montana, early in May. The entire party, outfit and pack horses included, were shipped over the Great Northern Railway to Laurier, Washington, arriving on May 16. Triangulation was commenced by establishing two stations, "Buck" and "Horn", about 6 miles east of the eastern crossing of the Kettle River. From here a reconnaissance was carried westward and stations were selected through which to develop a scheme of triangulation along the boundary to the Similkameen River. The reconnaissance included the location of a base to be measured on the Great Northern Railway near Danville, Washington.

This reconnaissance had scarcely been begun when the observer received an appointment on the Panama Canal and left the party. The assistant in charge of the third astronomic subparty was transferred from the vicinity of Gateway, Montana, to take his place. Work progressed so well that on August 9 the observer was transferred back to take charge of a vista-cutting party. On August 24 the reconnaissance was completed to the Similkameen River and a junction was made with the triangulation of the United States topographic party working westward.

The assistant in charge of the party which up to this time had been carrying on the reconnaissance now took over the observing and carried it on until September 17, by which time most of the work had been completed. Smoke from forest fires was unusually dense and had already retarded work to a great degree. It now became much more troublesome so that observations could not be made for days at a time. It was October 1 when the party had completed observing and reached Danville to measure the base which had been laid out nearby.

A day or two after reaching Danville the assistant in charge, Mr. John Nelson, was taken ill and was moved to a hospital in Grand Forks, British Columbia, where he died on October 5. He was buried at Grand Forks on October 8.

The chief astronomer measured the base and completed the triangulation on this section of the boundary a short time later.

Upon the death of Mr. Nelson, the party which had been under his direction was set at erecting monuments under the direction of the head packer. The first monument on this section of the boundary was set at Carson on October 10 under the personal supervision of the chief astronomer. The work was continued by the party until 16 monuments had been set between the most eastern crossing of the Kettle River and the summit of the mountain near the Paris Mine west of Danville. The material for most of these monuments, aggregating about one thousand pounds for each monument, was carried to the sites by pack horses. Some of the sites were extremely difficult to reach even with pack horses. In one instance a horse, loaded with sand, fell from a cliff bordering a difficult piece of trail and was killed.

Monument setting was completed on November 10 and the party disbanded.

SECOND ASTRONOMIC SUBPARTY

The second astronomic subparty was organized early in May at Gateway, Montana. Work was commenced on the chord between original boundary cairns 153 and 154 (now Monuments 245 and 247). This chord is just east of Gateway and passes over comparatively level and open country. On account of its accessibility and the ease with which it could be surveyed, work on it had been postponed the previous season in favor of more difficult tasks. The party now ran a stadia survey along the chord, cut out the vista, and located an intermediate monument site. They also located an intermediate monument site at the railroad crossing at Gateway, on the chord between boundary cairns 152 and 153 (now Monuments 243 and 245).

This work was completed May 23, whereupon the party moved to the west side of the Kootenai River and completed the stadia traverse between boundary cairn 151 (now Monument 241) and the Purcell summit. Next, triangulation station "Kootenai", where work had been suspended on account of snow in 1903, was cleared and the necessary observations made to incorporate it into the previously observed triangulation scheme. On June 13 the party moved eastward again and made a systematic test of the alinement of the monument sites on the chord between original boundary cairns 154 and 155 (now Monuments 247 and 254) and at the same time cut horse trails to the monument sites.

The party next moved west of the Yaak River and took up vista cutting and stadia surveys along the boundary where it had been interrupted by snowstorms the preceding year. The work was continued westward to a junction with the work of the United States topographic parties and was completed on July 20.

The party then trekked eastward once more to complete the triangulation scheme between the Wigwam River and the summit of the Rocky Mountains. Signals were rebuilt on the old stations and three new stations were selected to complete the scheme. This reconnaissance was completed early in August. Before observations could be commenced forest fires broke out and continued almost without intermission until November, blanketing the entire region with smoke and preventing trustworthy observations. The assistant's journal was a record of discouraging and futile efforts to make observations—climbing day after day to the peaks only to be baffled. A few light showers of rain fell but were insufficient to check the fires or clear the atmosphere. Later on there were snow flurries followed by fog in addition to the smoke. Violent windstorms occurred which overturned signals in several instances and prevented observations that could otherwise have been made. Everything seemed to combine to prevent the accomplishment of results. Near the middle of October the snowfall made the ascent of some of the peaks dangerous, their sides being almost sheer rock. Finally, during the latter part of October, pasturage for the pack horses was cut off by deep snow, and further attempts had to be abandoned.

When this happened, the party moved down the Flathead River and disbanded.

THIRD ASTRONOMIC SUBPARTY

The third astronomic subparty was organized at Gateway early in May. crossed the Kootenai River and cut the vista, made a stadia survey, and located an intermediate monument site on the chord between original boundary cairns 151 and 152 (now Monuments 241 and 243). Similar work was then begun west of boundary cairn 151 (now Monument 241). This had hardly been started, however, when the party disbanded and the assistant in charge of the party was transferred to the west to act as observer for the first astronomic subparty. He continued to act in that capacity until August 9 and then organized a party at Laurier, Washington, and began cutting vista along the boundary west from Laurier. This work was continued until August 28. The party then moved eastward with its pack train of 8 horses to Gateway, Montana, for the purpose of setting monuments in that vicinity.

The first new monument on the 49th parallel boundary was set by this party on September 12 under the personal supervision of the chief astronomer. monument now bears the number 242 and stands about 2½ miles west of Gateway.

There were 24 monuments available for setting at this time. These were set by the party between Frozen Lake on the east and the Yaak River on the west by October 19. The party was then disbanded at Gateway. The assistant in charge looked after the storing of property at Gateway and then returned to Danville, Washington, where he assisted the chief astronomer in completing the base measurements, observing azimuth, and completing the triangulation remaining to be done at the time of the death of the chief of the first subparty.

The personnel of the United States astronomic party was: Chief of party, C. H. Sinclair, Chief Astronomer; assistant in charge of first subparty, John Nelson; assistant in charge of second subparty, F. A. Camp; assistant in charge of third subparty, E. R. Martin; observer, A. M. Miller (for a short time only); and about

25 hands.

TOPOGRAPHIC PARTY

The United States topographic party in 1904 undertook to complete its part of the unfinished vista cutting and preparation of the line for monumenting on the section of the line east of Porthill, Idaho, and to retrace the boundary, cut the vista, execute the triangulation, and make the topographic surveys on the section of line between the Skagit and Similkameen Rivers.

The first work of the season was done by an advance level party which started at Bonners Ferry, Idaho, about March 15 and ran a checked level line from there along the Great Northern Railway through Porthill to Creston, British Columbia. The length of this circuit was about 66 miles. Six permanent and thirty temporary bench marks were set on this line. The levels were completed about the middle of April.

The main party assembled and organized at Harvey's Ranch near Copeland, Idaho, about the middle of May. Vista-cutting crews were organized and started at Porthill, on Mission Creek, and in the vicinity of the Moyie River, where the parties had been forced by snowfall to quit work in 1903. A small party checked the alinement of the chords between original monuments and made connections between them and the triangulation. This work was all completed by June 10.

On June 11 the personnel with all camp equipment and pack horses were assembled at Copeland and shipped on the same day over the Great Northern Railway to Wenatchee, Washington. The expedition now consisted of the chief of party, 4 assistants, 25 hands, 27 horses, 20 mules borrowed from the United States Geological Survey at Wenatchee, the camp gear, instruments, and baggage.

From Wenatchee the entire outfit was shipped on river steamers of the Columbia and Okanogan Steamboat Company to Riverside, Washington, the head of navigation on the Okanogan River from where men and material were transported to Loomis, Washington, 35 miles distant, by hired wagons, while the loose animals were herded in by the packers.

A base camp at McDaniel's Ranch 2 miles from Loomis, near the beginning of the trail up Chopaka Mountain to the boundary, was occupied by June 16.

Three subparties were formed: the first for retracement and projection of the line; the second for triangulation; and the third for topography and vista cutting.

LINE PROJECTION SUBPARTY

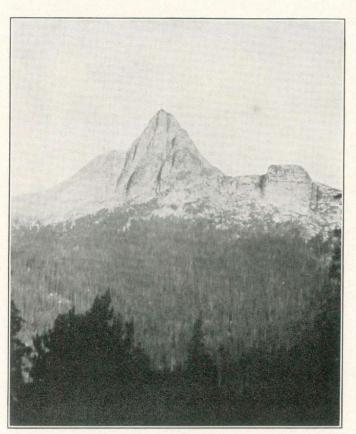
The line projection subparty began work at original boundary cairn 64 (now Monument 109) on the west side of the Similkameen River. From there a random line was run from summit to summit of the intervening ridges to boundary cairn 63 (now Monument 101), a distance of 12 miles. The corrections to the random line were computed, laid off, and marked on the ridges with sufficient accuracy to permit the vista crews to start slashing by the 27th of June.

The party then established the boundary westward across the unmarked interval of 23 miles to the Pasayten River. This was somewhat more difficult as there were no trails and the country was covered with a thick growth of timber filled with a tangle of underbrush and windfalls. The mules borrowed from the Geological

Survey were used in this advance work for the reason that mules will pick their way through trailless woods with an ease and freedom from fretting not usual with horses under like circumstances.

The party made the final location of the line to the Pasayten River on July 15 and, after a trip out for provisions, established the 24-mile chord between the Pasayten and Skagit Rivers, finishing during the first week in August.

Upon the conclusion of line projection, the assistant in charge organized an additional vista-cutting crew and at the same time took charge of the vista crews which up to this time had been under the topographic subparty. While super-



CATHEDRAL PEAK, A BALD GRANITE SUMMIT OF THE CASCADE MOUNTAINS, JUST SOUTH OF THE INTERNATIONAL BOUNDARY, USED AS A TRIANGULATION STATION

vising these crews, he made additional checks of the alinement of all the chords from the Skagit River to the Similkameen River.

The first vista-cutting crew completed its section of the boundary and moved out of the mountains on September 25, as did the other two crews on October 9. The assistant in charge completed the testing of the alinement of the chords and reached Loomis on October 8.

One of the vista-cutting crews was paid off, another was sent to the Similkameen crossing to cut vista up the side of Chopaka Mountain, and the third was sent to Danville, Washington, to cut vista eastward toward Laurier, Washington, to the point where the United States astronomic subparty had suspended work on August 28.

When the vista-cutting crew on the slope of Chopaka Mountain

completed its work there, it was transferred to Midway, British Columbia, and placed on the vista between Midway and Danville which had been partially cut in 1901. While these operations were progressing the assistant in charge set the 9 monuments now numbered 141 to 149. The vista cutting by the two crews and the monument setting were completed November 2. The hands were paid off the next day. The assistant, foreman, and packers then assembled the scattered outfits for winter storage. The party was completely disbanded on November 7.

TRIANGULATION SUBPARTY

The triangulation subparty under the direction of the chief topographer was organized immediately after the arrival of the main party at Loomis, Washington.

It was made up of two self-dependent units, one for reconnaissance and signal building, and one for observing. Work commenced at the United States Geological Survey stations "Chopaka", "Lemanasky", and "Bonaparte" and was carried westward along the boundary to points west of the Skagit River. Work progressed satisfactorily until August 1 when smoke from forest fires began to interfere with the visibility. From August 10 to September 1 and from September 20 to September 30 the smoke was so heavy that it seriously interfered with topographic work and prevented observations altogether on triangulation. The reconnaissance was completed September 10 and the foreman in charge was transferred to a vista-cutting crew. The triangulation observations were completed on October 20 and the party disbanded at Loomis.

TOPOGRAPHIC AND VISTA-CUTTING SUBPARTY

The topographic and vista-cutting subparty, composed of about 40 men, left the base camp at McDaniel's Ranch over the Chopaka trail for the boundary on June 20. It required 40 pack horses to transport the equipment, and these, together with the men on foot, made an imposing procession as they climbed the mountain trail in single file. Having reached the nearest point to the boundary on this trail, the party went into camp and began cutting trails to the boundary so that the vista-cutting crews could camp conveniently near their work. On June 27 two vista-cutting crews of 16 men each had been placed in convenient spots and began cutting vista on the 12-mile chord established by the line projection party between boundary cairns 63 and 64 (now Monuments 101 and 109).

The assistant in charge now began the topographic mapping, combined with a reconnaissance for routes of travel. A few days later a gang of 4 men was put to work on building a trail over which to proceed westward. This gang was kept busy nearly all of the summer, and at times had to be reenforced by axmen from the other crews.

The topographic mapping, trail location and building, and vista cutting all proceeded in an orderly manner without interruption until the first of August, when forest fires became plentiful in the mountains. Smoke from the fires seriously interfered with the topographic work and the proximity of fire endangered the camps on several occasions to such an extent that lookouts had to be maintained to warn the men if the fire headed their way. On one occasion all hands had to fight fire all day to protect the camp.

About August 10 the assistant in charge of the line projection party, having completed the retracement and establishment of the boundary to the Skagit River, relieved the assistant in charge of the topographic party of the supervision of the vista-cutting crews so that he might devote all his time to topography and thus insure its completion before snow fell.

At about this time it became known that it was feasible to run a line of levels from a United States Geological Survey bench mark near Barron, Washington, across the ridge and down the Pasayten River to the boundary to give a check on the elevations carried by vertical angles from the Similkameen River. A party of 5 men was sent to Barron, August 13, to run this 30-mile line. The party succeeded

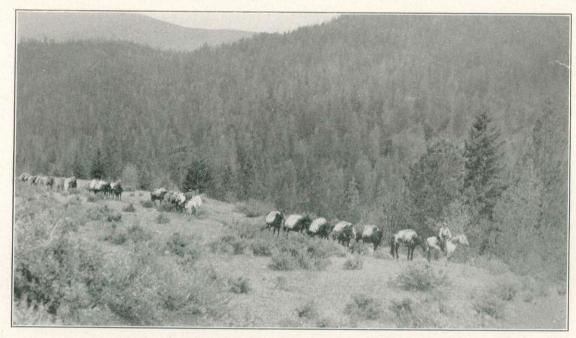
in reaching the boundary with the line but was unable to check back on account of snow that had begun to fall before the boundary was reached. They succeeded in getting out of the mountains before snow entirely blocked the trails, reaching Loomis on October 17.

Topography was completed to the Skagit River on September 25 and the party moved out over the old Fort Hope and Dewdney Trails to Princeton, British Columbia, arriving on the 27th. From Princeton the party continued on to the boundary crossing at the Similkameen River where it was engaged during the first half of October on nearby topographic work.

On October 15 the topographic subparty moved from the Similkameen to Danville, Washington, and from there did the mapping between Danville and Laurier, Washington. This piece of work required the greater part of a month. The party disbanded on November 14, the last of the parties to leave the field.

Transportation for the various subparties in the Cascade Mountains during the season of 1904 was a most important phase of the work. The number of men employed in the parties ranged from 60 to 70. An equal number of pack animals was required to move the camps and to keep them supplied with provisions. The only trails approaching the boundary from places which could be used as supply points were from Loomis, Washington, to the summit of Chopaka Mountain, and from Princeton, British Columbia, to the crossing of the Skagit River. These two points of approach were 60 miles apart, and the intervening country was entirely without trails.

The small triangulation and line parties were each furnished with their own saddle and pack animals, and as most of their movements were in advance of the larger crews, they were forced to make their way through the mountains, largely without trails. Mules were used, being adept in traveling over rocky country and



ON THE WAY WITH THE PACK TRAIN; IN THE CASCADE MOUNTAINS

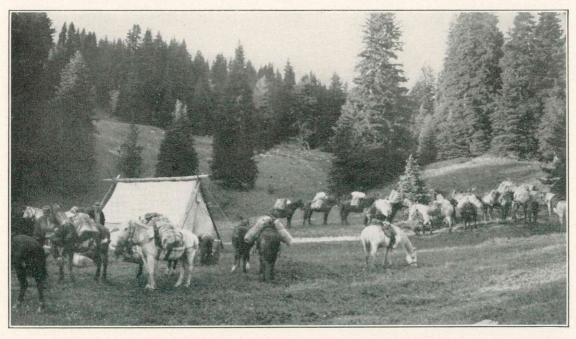
through brush and windfalls. The large and slower moving vista-cutting crews were moved and supplied by a pack train of about 30 horses under the direction of a head packer operating from base supply camps established at suitable places.

Trails had to be opened for this pack train in order that it might work with maximum efficiency, so during the course of the season a continuous main trail was constructed along the boundary from Chopaka Mountain to the Skagit River. From this main trail many branch trails were cut in order to place camps at convenient locations on the boundary and to reach the selected monument sites. These trails, including the branches, totaled 120 miles.

The first approach to the boundary was over the Chopaka Mountain trail from the supply camp at McDaniel's Ranch near Loomis. After work had progressed some distance westward, it was found that a day's travel for the pack train could be saved by cutting a trail about 15 miles long up Toats Coulee to the boundary trail. This trail was cut by a special gang of 10 men, between July 5 and 24.

After opening up the Toats Coulee trail, the special crew was sent to Princeton, British Columbia, where they cleared out an old trail up the Similkameen River to the forks of the stream and from there built 15 miles of new trail up the Pasayten River to the boundary. This trail was completed about August 15, and the source of supplies was then changed from Loomis to Princeton, British Columbia. This not only shortened the distance for the pack trains, but provided a route of low elevation as an egress from the mountains should the parties get caught in an early snowfall.

The supplying of forage for the pack animals in the Similkameen-Skagit section was much simplified by the numerous open mountain parks covered with a luxuriant growth of nutritious grass which with a small ration of grain sufficed to keep the animals in good condition.



PACKING UP CAMP AT PARK PASS IN THE CASCADE MOUNTAINS

At the close of the season of 1904, the major part of the field work on the sections of the boundary west of the summit of the Rocky Mountains assigned to United States parties had been completed. The retracement and survey of the line, the vista cutting, the selection and location of new monument sites, and the topographic mapping were entirely finished. The triangulation still required a small amount of work to bring it to completion. Forty-nine new monuments had been set, and everything made ready for the setting of the remainder.

The personnel of the United States topographic party was: Chief of party, E. C. Barnard, Chief Topographer; assistant in charge of line projection work, D. L. Reaburn; assistant in charge of triangulation, Sledge Tatum; assistant in charge of topography, J. G. Hefty; transitmen, Thomas Riggs, Jr., J. P. Brecken-

ridge, W. B. Reaburn, G. H. Wheeler; and from 40 to 65 hands.

SEASON OF 1905—DETACHED SECTIONS WEST OF THE SUMMIT OF THE ROCKY MOUNTAINS

Field operations were continued in 1905 by Canadian and United States parties in much the same manner as in previous seasons. The Canadian forces completed the work on the sections of the boundary assigned to them between the Kootenai River at Porthill, Idaho, and the most eastern crossing of the Kettle River, and from Midway, British Columbia, to the Similkameen River, and did a large amount of work on the section from the Skagit River to Point Roberts. The United States parties completed all work on the sections that had been assigned to them.

CANADIAN PARTIES

The Canadian forces in 1905 were divided into several small parties operating at times in widely separated places. At other times these small parties were assembled and combined into larger units.

LINE PARTY

During the last week in April a line party of 14 men was organized at Midway, British Columbia, for the purpose of clearing and widening the vista along the boundary between Midway and the Similkameen River which had been cut by the Canadian reconnaissance parties of 1901. While so engaged they made a topographic survey on each side of the boundary between Osoyoos Lake and the Similkameen River for the purpose of supplementing the phototopography done in 1901. The party completed these operations to the Similkameen River on June 20, whereupon it moved by pack train to Princeton, British Columbia, and thence by the old Dewdney Trail to the Skagit River and down that stream to the boundary crossing, which was reached July 6.

A trail-building party of 12 men, with a pack train of 15 horses, organized at Hope, British Columbia, on June 1, had preceded the line party to the Skagit River and was engaged in building a trail westward along the boundary toward Chilliwack Lake, when the line party arrived. Although this is a very difficult country, the trail builders had made good progress, making it possible for the line party to begin imme-

diately on the 9-mile chord from original boundary cairn 55 (now Monument 71) on the west side of the Skagit Valley to original boundary cairn 54 (now Monument 67) near the head of Depot Creek.

This chord passes over very rough country. It crosses five high ridges and three glaciers on the north shoulder of Glacier Peak, reaching an elevation of 7,700 feet. One of the high ridges crossed is so sharp and the rock so disintegrated that it was impossible to set up a transit without extensive preparation of the station.

Before the line could be laid down, smoke from forest fires seriously retarded the work. Vista cutting was slow on account of the heavy timber on the slopes and in the ravines. Under these adverse conditions it was September 12 before the party reached boundary cairn 54 and had even then not fully completed the vista cutting on the chord. An attempt to carry on phototopographic surveys together with the other work failed of accomplishment in the smoky atmosphere. In the meantime the trail-cutting crew had completed the trail from the Skagit River as far west as original boundary cairn 52 (now Monument 65) on Depot Creek.

As the weather had now become very wet and stormy, it seemed wise to leave the mountains for the season. The two parties withdrew by the way of the Skagit to Hope and thence down the Fraser Valley to Sumas Prairie, where they were merged for vista cutting. Beginning at Monument 41, the vista was recut to the westward in order that measurements might be made along the line. This vista had been first opened by the reconnaissance party in 1901, a fact now almost unbelievable in view of the height and density of the forest growth of the intervening four years.



GLACIER PEAK, CASCADE MOUNTAINS, A TRIANGULATION STATION 2 MILES SOUTH OF THE INTERNATIONAL BOUNDARY. VIEW FROM THE NORTHWEST

While vista cutting was progressing, two small topographic units of the party were employed in road traverse and other surveys from which to construct a topographic map. Vista cutting and topography were carried on until October 19 to a junction with like work of another party at Monument 21. The party was then disbanded for the season.

WESTERN TRAIL- AND VISTA-CUTTING PARTY

A small trail- and vista-cutting party was organized in July in the Columbia Valley in the western foothills of the Cascade Mountains. This party cut a trail from the Columbia Valley east along the line through the heavy timber and windfalls, for about 4 miles, to the summit of the first high ridge of the Cascade Mountains. They then cut the vista along the line from Monument 43 in the Columbia Valley to Monument 41 and eastward from Monument 43 to the foot of the mountains.

Following this the party moved by hired teams to Monument 21 between Sumas and Blaine, Washington, and began recutting vista along the line to the west. The party was reenforced about the middle of September by the monumenting party which had completed its work on the Similkameen-Midway section.

The combined party completed the opening of the vista from Monument 21 to Monument 5 on Semiahmoo Bay and replaced the original cast-iron pillars numbered 5 to 9 inclusive with aluminum-bronze monuments. They disbanded on October 19.

TOPOGRAPHIC PARTY

A party of 6 men with 6 horses was organized at Paterson, British Columbia, for the purpose of completing the topographic surveys where smoke had interfered during the previous season. This party completed the topographic surveys, including the traversing of the roads, from Little Sheep Creek to the eastern crossing of the Kettle River near Laurier, Washington, in the third week of July and then moved to Midway, British Columbia, where they arrived July 25.

At Midway the party began a double-rodded stadia survey from monument to monument from original boundary cairn 96 (now Monument 141) to original boundary cairn 64 (now Monument 109) on the Similkameen River. Work was completed September 11 and the hands of the party were paid off. The horses and outfit were turned over to the monumenting party working in the same vicinity. The engineer in charge of the topographic party and his assistant were sent to Blaine, Washington, to superintend the vista-cutting party between Monument 21 and Semiahmoo Bay for the rest of the season.

MONUMENTING PARTIES

There were two Canadian monumenting parties during the season. One, consisting of 6 men and 8 pack horses, was organized at Waneta, British Columbia, on May 15. This party set the 26 monuments between the Columbia and Kootenai Rivers by August 10, then returned to Waneta, crossed the Columbia River, and set the 14 monuments between the Columbia and Kettle Rivers, completing the work on October 1. The party then disbanded at Cascade, British Columbia.

The other monumenting party, consisting of 5 men and 5 horses, was organized at Midway, British Columbia, on May 10. This party replaced the original boundary cairns between Midway and the Similkameen River with aluminum-bronze monuments. They reached the Similkameen on September 11 at the same time the topographic party had completed its work and disbanded. They took over the outfit and pack train of the topographic party and moved the combined outfit over roads and trails by the way of Princeton and Hope, British Columbia, and thence down the Fraser Valley and across to Blaine, Washington, where the party was merged with the western trail- and vista-cutting party already described as working between Monument 21 and Semiahmoo Bay.

TRIANGULATION PARTY

A party of 5 men, provided with 8 horses, was organized at Waneta, British Columbia, on May 1 for the purpose of completing the triangulation scheme from the Kootenai River at Porthill, Idaho, to a junction with the work of the United States parties at stations "Buck" and "Horn", near the eastern crossing of the Kettle River. This party completed its work and disbanded on August 21.

The personnel of the Canadian parties was: Chief of party, J. J. McArthur, D. L. S.; assistant in charge of triangulation, Howell Bigger, D. L. S.; assistant in charge of line projection, Noel J. Ogilvie, D. L. S.; assistant in charge of topography, S. S. McDiarmid, D. L. S.; other assistants, J. M. Sheppard, E. T. de Coeli, Stanley Everall, J. W. McArthur; and from 40 to 50 hands.

UNITED STATES PARTIES

The United States forces engaged in field work in 1905 were, as in the previous seasons, divided into two main parties, one under the direction of the chief astronomer and one under the chief topographer. These in turn were divided into various subparties.

ASTRONOMIC PARTY

The chief astronomer's party was divided into a triangulation subparty and a monumenting subparty, both employed on the section of the boundary from the Kootenai River at Porthill, Idaho, to the summit of the Rocky Mountains. In addition thereto, the chief astronomer maintained a magnetic party which during the season made observations along the boundary from Point Roberts to Phillipps Creek east of Gateway, Montana. This work, not being entirely germane to the resurvey and demarcation of the boundary, is not herein described.¹³

TRIANGULATION SUBPARTY

The triangulation subparty gathered at Gateway, Montana, about the middle of May. Their first objective was to connect the boundary monuments in the vicinity of Gateway, between Phillipps Creek on the east and Purcell summit on the west, with the triangulation scheme. They had intended to continue westward tying in monuments to the triangulation scheme, but the snow was still too

¹³ The results of the work are to be found in the records of the United States Coast and Geodetic Survey.

deep on the mountains to permit horses to cross the high summits and further work was postponed until the observations in the vicinity of Gateway had been completed. In addition to doing triangulation, the party set 4 monuments in the vicinity to fill in a gap left in the monumenting of the previous autumn.

Upon the completion of the work on June 10 at Gateway, the party moved by railroad to Belton, Montana, in order to approach the Rocky Mountains by the way of the Flathead Valley. At Belton the necessary outfitting and recruiting were done for the formation of a monumenting subparty, and on June 14 the party set out with a four-horse wagonload of supplies for the boundary. Reuter's ranch, where the horses and outfit of the triangulation party of 1904 had been cared for during the winter, was reached on the 15th. Here the camp outfit was overhauled and the party organization completed. The two parties then proceeded up the river and established a base camp 4 miles south of the boundary, from which both parties might operate.

Notwithstanding the probability of snowstorms occurring in these altitudes as late as July, and the difficulty of crossing the winter's snow still remaining, the experience of the triangulation party of 1904 with smoke, in the latter part of the season, influenced the choice of the early part of the season as being the more favorable to success.

The triangulation subparty first moved west of the Flathead and rebuilt the signals on stations "Canada" and "Tuchuck", then crossed to the east side and occupied station "North Divide", where it was delayed for some time by snow and hailstorms. Returning west, station "Hefty" was occupied and the alinement of a monument site nearby was checked. This done, the party recrossed to the east side of the Flathead and occupied stations "Kishenehn", "South Divide", Monument 272 on the summit of the Rocky Mountains, and "Kintla", completing the program as planned. The last station in this list, "Kintla", is the loftiest and most difficult to climb of the boundary stations in the Rocky Mountains, being 9,928 feet in elevation and extremely steep. Six days were spent in reaching the station and making the observations.

Upon the completion of the Rocky Mountain observations, the party moved westward to Gateway, stopping on the way to reoccupy stations "Tuchuck", "Canada", and "Green." Arriving at Gateway August 1, the party continued westward over the Purcell summit and took up the triangulation which had been postponed earlier in the season.

In this western work, the party made observations to connect 24 boundary monuments with the triangulation stations, checked the alinement of a number of intermediate monument sites, opened up main trails for the use of the monumenting party, and cut trails to four monument sites. Observations were made from station "Ewing" of the main scheme which up to this time had not been done.

The weather during the last part of September and the first of October was very stormy and greatly retarded progress. Fortunately, the monumenting party completed its work on September 25, and was able thereafter to assist the triangulation party to such an extent as to overcome the weather handicap and permit the completion of the triangulation by October 15.

MONUMENTING SUBPARTY

The monumenting subparty was formed at the base camp on the Flathead River 4 miles south of the boundary on June 17 in conjunction with the organization of the triangulation subparty. Arrangements had been made to have the monuments and portland cement freighted from Belton to the base camp. Monuments 258 to 267 (present numbers) were packed to their sites and set between June 19 and July 8 without especial trouble or incident.

The remaining 5 monuments, numbers 268 to 272, had to be placed on high and rocky summits which were difficult to reach. They were hauled by wagon to Lower Kintla Lake and from there were distributed by boat and pack train to Upper Kintla Lake and to the nearest points of approach to their sites. The final

packing to the sites had to be done by men.

Monument 272 was set on the crest of the Rocky Mountains after two days' The back-packing was for a distance of over a mile and up a cliff 500 hard work. feet high. Fortunately, sand was found near the site and the melting snowbanks furnished water on the spot for the concrete mixture. The site for Monument 271 was easy of access but it required two days to check the alinement on account of the two almost inaccessible points east and west of it which had to be occupied by transit. It required four days' hard work to place and set Monument 270 on the peak nearly 4,000 feet above the lake shore. Monument 269 is nearly 5,000 feet above the lake and had to be back-packed on the hard climb from the lake. ument 268 was the most difficult to set of all those in the Rocky Mountains. It is on the precipitous west end of the Sawtooth or Boundary Mountains and seemed naccessible from below. The trail used led over the summit of the ridge and the monument was finally lowered by ropes to its site below the cliffs. Six days were required to get it from the lake to its site and to set it. By the exercise of great care and by good fortune the work of setting these monuments was accomplished without accident to man or horse although narrow escapes were frequent.

The monument setting in the Rocky Mountain section was completed on August 2 and the party immediately started west over the Phillipps Creek trail for Gateway. It had been intended to move the party by team to Belton and by railroad from there to Yahk Siding, British Columbia, but a labor strike on the part of the telegraph operators so interfered with railroad dispatching as to make this impossible. Consequently, the move had to be made across the mountains by pack train. To lighten the loads and facilitate the move, an extra pack train of six animals and a packer were hired. The trip to Gateway and from there to Yahk Siding was com-

pleted on August 14.

Monuments and cement for the interval of boundary from the Yaak River to Porthill had been delivered by rail and wagon to convenient depots near the boundary. From these depots, they were moved to their proper sites by pack train. The hired pack train was retained to assist with the work.

Beginning with Monument 228, where monumenting had been discontinued in 1904, the party set the 22 monuments to and including Monument 207 at Porthill, Idaho, finishing on September 25.

There was one monument still to be set at Laurier, Washington, to mark the railroad crossing. The foreman and one man were sent there to locate the site and set the monument, which was done on September 29.

At Porthill the remainder of the monumenting party joined the triangulation subparty and assisted it for the rest of the season. The combined party disbanded at Bonners Ferry, Idaho, on October 17.

The operations just described completed the field work of the astronomic party on the boundary west of the summit of the Rocky Mountains. The field equipment of the party was no longer needed, and therefore, the pack trains were assembled at Bonners Ferry and sold at public auction. The still serviceable camp equipment was gathered together and stored at Gateway, Montana, with the thought that it might be used by inspection parties of the future.

The personnel of the United States astronomic party in 1905 was as follows: Chief of party, C. H. Sinclair; assistants, E. R. Martin, William Kendrick; and 10 hands.

TOPOGRAPHIC PARTY

The program for the United States party under the chief topographer contemplated the completion of all field work on the boundary between the Skagit and Similkameen Rivers, consisting of checking the monument sites, extension of triangulation, and the running of some level lines; the continuation of triangulation undertaken by the United States Geological Survey, east along the line from Blaine, Washington; and the determination, by levels, of an elevation at the boundary crossing of the Columbia River.

The first undertaking of the season was the determination of an elevation at the boundary crossing of the Columbia River. A party of two ran a checked level line from a Geological Survey bench mark at Meyers Falls, Washington, over the Great Northern Railway for a distance of 45 miles to Waneta, British Columbia, and set 15 permanent bench marks, one at the boundary crossing and the others at intervals of about 3 miles. Leveling was begun May 7 and completed June 7.

The main party assembled at Loomis, Washington, the last of May and established camp at McDaniel's Ranch, the base camp of 1904. Before the party met, arrangements had been carried out for the delivery of monuments and monumenting material to the boundary pack trail routes, thereby making it possible for the party to begin distributing and setting monuments at once. The first move was to the crossing of the Similkameen River. From this camp Monuments 108 and 109 were set. A return was then made to McDaniel's Ranch and the entire outfit moved to Gold Hill. From Gold Hill the party moved to a camp in Horseshoe Pass about one mile south of the boundary and was there occupied for a time in clearing the trails cut the previous season.

The party was then divided into a triangulation subparty and a monumenting subparty.

TRIANGULATION SUBPARTY

The triangulation subparty first made an additional check of the alinement of the interpolated monument sites, the testing of which on the first chord west of the Similkameen River was quickly accomplished. To the westward, the work was held up from June 14 to June 28 by deep snow in the high mountain passes, where in addition to the winter's snow, which still blocked the trails, new snow fell nearly every day. After this unavoidable delay the work proceeded without interruption to completion at the Skagit River on July 28.

On July 29 the party commenced extending triangulation westward across the Skagit for the purpose of furnishing control to the Canadian parties and, at the same time, to connect with the triangulation of a United States Geological Survey party working eastward from Blaine and Bellingham, Washington. The completion of this work as planned was prevented by smoke and long continued bad weather culminating in an early snowfall of such depth as to force the party to withdraw from the mountains on October 1. However, triangulation was carried westward far

enough to serve the Canadian needs and to obviate the necessity of continuing the work another season. The party reached Loomis on October 3.

MONUMENTING SUBPARTY

Two monumenting subparties consisting of two fully equipped crews started from Horseshoe Pass on June 9. From June 9 to July 5 each crew maintained its own camp; thereafter both operated from a common camp. Supplies came by pack train from Loomis until the latter part of July. The supply base was then transferred to Princeton and there maintained for the rest of the season.

Distributing and setting monuments were generally carried on rapidly and



A CEDAR LOG USED AS A BRIDGE ON THE SKAGIT RIVER

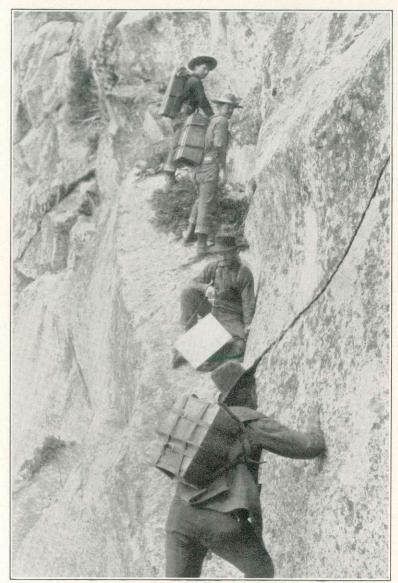
without unusual difficulties. Monuments and material were packed to the sites by horses save in two instances where the precipitous approaches necessitated backpacking by the men. Monument 95 on the north shoulder of Cathedral Peak was the only one difficult or dangerous to set. It stands on a knife-like rock ridge so narrow that a place had to be blasted out to make room for the monument. At the upper end of the climb, monument and material had to be lifted up by ropes from shelf to shelf on the cliffs. In making the ascent one man lost his footing and fell 30 feet to a rock shelf below, but miraculously sustained only severe body bruises.

Setting the 38 monuments from the Similkameen River to the Skagit River was completed by setting Monument 72 on the east bank of the Skagit on August 28.

LEVEL SUBPARTY

During the first week in September a level party of 4 men, equipped with camp outfit and pack train, was put in the field for the purpose of checking the line of

levels run in 1904 from Barron, Washington, to the boundary crossing of the Pasayten River. The party began work September 7 at the bench mark established in



TRANSPORTING THE SECTIONS OF AN ALUMINUM-BRONZE MONUMENT OVER A DIFFICULT BIT OF TRAIL IN THE CASCADE MOUNTAINS

1904 at the boundary crossing and leveled southward, over the line of the previous season, to Barron.¹⁴ The line was closed on the bench mark at Barron on September 30.

On the return trip by the way of the boundary trails to Loomis, Washington, the party was caught in an early snowstorm and before the trip was finished had to force its way without feed for the horses over mountain passes through snow from 3 to 4 feet in depth. After a week of strenuous travel the party arrived in Loomis on October 7.

For the purpose of making a comparison of the plane-table method used by United States parties with the phototopographic method used by Canadian parties in making topographic maps, the United States chief topographer had agreed with the Canadian chief of party to duplicate the surveys done by the Canadian parties on the

strip of territory 2 miles wide along the south side of the boundary from the Similkameen River to Osoyoos Lake.

This survey was made by a party organized on October 6–8 from the returning mountain parties and headed by the chief topographer. The work was ended October 30.

A comparison of results showed the two methods to be equally satisfactory in a country of bold relief.

¹⁴ Barron, Washington, was a mining settlement near the crest of the Cascade Range, to the west and not far from States Pass at the heads of Ruby Creek, the Pasayten and the Methow Rivers. The name no longer appears on maps or in the Postal Guide (February 1936).

As the parties returned from the mountains to Loomis, the hands were paid off, the outfits stored, and the horses pastured until only the small topographic party remained in the field. At the end of October that party had brought to a close the field operations of the United States parties on the reestablishment and remonumenting of the 49th parallel land boundary west of the summit of the Rocky Mountains. No further use would be had for the pack trains and much of the camp equipment on hand. Before leaving the field, the topographic party sorted and inventoried the camp and work equipment, placed that part of it which was still serviceable in storage at Loomis, and prepared the rest for sale. On November 4 the condemned equipment and all of the pack horses were disposed of by public auction at Loomis and the party disbanded.

The personnel of the United States topographic party was: Chief of party, E. C. Barnard, Chief Topographer; assistants, J. G. Hefty, W. B. Reaburn, Thomas Riggs, Jr., George Neuner, Jr., W. W. Wineland; and 15 hands.

SEASON OF 1906—POINT ROBERTS TO THE SKAGIT RIVER

The field operations of 1906 were confined to the boundary extending from Point Roberts to the Skagit River. The triangulation connection with the work of the United States Geological Survey which had been unsuccessfully attempted by the United States triangulation party in 1905 was completed by a United States Geological Survey party through a cooperative arrangement between the United States Section of the Boundary Commission and the United States Geological Survey. All other work on this particular section of the boundary was done by the Canadian Section of the Boundary Commission.

CANADIAN PARTY

The Canadian party was organized at Sumas Prairie the last week in May. It consisted of 8 surveyors, 42 hands, and 42 horses. It was divided as work progressed into several subparties to facilitate operations.

FIRST SUBPARTY

The first subparty, a line measurement party of an assistant and seven men, was detached at Sumas Prairie and detailed to make a double-rodded stadia measurement from monument to monument along the boundary west from Monument 41 and to secure topographic data. This party carried the stadia measurement west as far as Monument 21 and made topographic surveys of the towns of Sumas and Clearbrook, Washington, and Huntingdon, British Columbia. They then returned to Monument 41 and measured the line to Monument 43 in the Columbia Valley.

A pack-train camp was provided for the party in the Columbia Valley in order that it might project the chord from Monument 43 eastward to the monuments in the Tamihi Valley.

The party moved from the Columbia Valley over the trail, constructed the previous season, to the summit of the first high ridge crossed by the boundary. On this ridge, after a good deal of heavy chopping and delays caused by smoky weather, the first point on the trial line was determined on a prolongation of the line passing through Monuments 41 and 43. The plan of operation was to transit the line from ridge to ridge. This required the cutting of a vista across the summits. Some of the summits were quite broad and after a point had been placed on the line, the vista had to be opened for a quarter of a mile or more in order to secure a sight to the next ridge. Due to frequent camp changes, a number of men were kept constantly on trail construction, and when smoke prevented line projection all hands were so occupied. Several canyons or ravines 1,500 to 2,000 feet deep, tributary to the Chilliwack River, crossed the boundary, making it necessary to build trails around their heads, cutting the grades along the steep hillsides through heavy timber and windfalls.

About 10 miles east of the Columbia Valley the boundary crosses a rocky ridge at an elevation of nearly 6,000 feet. Here to the south of the line is a beautiful alpine park area with grass-covered slopes, intercommunicating lakelets, and scattered clumps of fine evergreen trees. This park made an ideal camping place and its meadows furnished excellent forage.

From the park eastward to the monuments on Tamihi Creek the forest growth was large and dense. The jungle of underbrush and windfalls made travel, even on foot, almost impossible without trails. The windfalls, often from 6 to 9 feet in diameter and from 150 to 200 feet long, could be used as footpaths when fortunately lying in the direction of travel, but when lying crosswise, as they perversely seemed



TAMIHI MOUNTAIN, BETWEEN SILESIA AND MIDDLE CREEKS, CASCADE MOUNTAINS. VIEW FROM THE NORTH

to do most of the time, presented an obstacle only to be overcome by improvising a ladder or by crawling around either end through the dense brush and devilsclub ¹⁵ which often attained a height of 10 or 12 feet. After much time and strenuous labor, the trail was completed through the forest to a junction with the Tamihi Valley trail, the trial line was completed and its offset from boundary cairn 46 (now Monument 52) was measured.

The party then turned westward to the first summit east of Columbia Valley and determined the true line on that summit by laying down the offset computed from the results of the trial line. Vista cutting on the true line to the eastward was then begun. However, the season was getting late, the weather was wet and cold at this high altitude, and work could no longer be carried on to advantage. The party suspended operations on October 20.

MAIN PARTY

After the detachment of the subparty whose operations have just been described, the main party moved from Sumas Prairie to and up the Chilliwack Valley to McGuire's ranch, where headquarters were established for the season. The buildings and corrals on the ranch were rented and the owner was hired to receive and care for supplies.

The approach to the boundary from the Chilliwack Valley was used by the western Canadian reconnaissance party in 1901 and many miles of trail were built at that time. These trails were now badly overgrown with brush and filled with windfalls. The first task of the party of 1906 was to reopen the old trails and to build additional ones. This job proved to be one of the heaviest of the season.

An attempt to bridge the Chilliwack River near the mouth of Tamihi Creek was made by felling trees across it as in 1901. Now, however, the trees snapped like pipestems in the swift water and the plan had to be abandoned. A steel cable was secured and swung across the stream, by aid of which a serviceable one-span bridge was constructed.

SECOND SUBPARTY

Upon the completion of the bridge, a second subparty of 10 men, in charge of an assistant, was detailed to open the trail of 1901 up Tamihi Creek to the boundary, to search for boundary cairns 44, 45, and 46 (now Monuments 50, 51, and 52), and to open up the old vista between them. A passable trail to the boundary was soon built and a search instituted for the cairns. The unmistakable remains of cairn 46 were found agreeing with the description of the United States reconnaissance party of 1901, and the removal of the stones revealed the original center stake. The old vista was cleared westward from this point and measurements made to where cairns 45 and 44 should have been according to the records given by the original Commission. Although a most careful and painstaking search was made, the cairns could not be found. A representative of the United States Commissioners took part in the search and concurred in the opinion that snow and rockslides had obliterated all

 $^{^{15}}$ A rank growing and extremely spiny a raliaceous shrub of the northwest Pacific coast—Echinopanax horridus.

traces of them. The monuments eventually set to take their places were located on the curve of the parallel passing through cairn 46 and as near as practicable to the positions of the original marks.

The party next proceeded to project the chord east from boundary cairn 46 (now Monument 52) to boundary cairn 47 (now Monument 55) on Silesia Creek. The chord crossed an almost unscaleable shoulder of Red Mountain at an elevation of 7,300 feet and hence was most difficult to establish. To complicate matters smoke from forest fires prevented observations for days at a time. Finally, after ascending the Red ridge nine times, an approximate location of the chord was made and the party began cutting a wide vista along it from cairn 46.

During the smoky weather, a successful search had been carried on for the original latitude station on Tamihi Creek and preparations were made to carry a small triangulation scheme from it to the boundary. However, continuous smoky weather and the exigency of line clearing prevented the execution of the triangulation.

The final adjustment of the chord from cairn 46 to cairn 47 was completed on September 9. The vista cutting was carried up the slope of Red Mountain to timber line by October 18. The weather then became so inclement that work could not be continued to advantage. The party withdrew from the mountains, reached McGuire's ranch on October 20, and there disbanded.

MAIN PARTY

The main party, whose trail-building operations to the mouth of Tamihi Creek have been recorded, continued that work up the Chilliwack Valley to Thurston's



LOOKING NORTHEAST FROM RED MOUNTAIN TRIANGULATION STATION IN THE CASCADE MOUNTAINS. THE PROMINENT PEAK ON THE LEFT IS TAMIHI MOUNTAIN; THE BOUNDARY VISTA ASCENDING THE EASTERN SLOPE OF THE SILESIA CREEK VALLEY IS SEEN ON THE RIGHT

ranch above the mouth of Silesia Creek. Here the party was again divided and a packers' camp and depot were established to keep the two parties supplied. The main party continued trail building up the Chilliwack when the third subparty worked its way up Silesia Creek.

THIRD SUBPARTY

The third subparty consisted of an assistant and eight hands. After pushing its way up Silesia Creek over the old trail of 1901 to the boundary, it established the 4-mile chord between original boundary cairn 47 on Silesia Creek and cairn 48 on Middle Creek (now Monuments 55 and 57) and made a phototopographic survey.

When this chord had been established, the party returned to the Chilliwack River and thence up Middle Creek to the boundary.

The next procedure was to start a trial line east from original boundary cairn 49 (now Monument 58). In the meanwhile, the main party had reached Dolly Varden Creek and started a trial line west from boundary cairn 50. By prearrangement, the two parties met on July 15 on the most eastern of the two intervening high summits and made a connection between the two trial lines. A system of signals was devised for jointly establishing the true line on the summits. This was successfully accomplished on July 25 after several delays caused by smoky weather.

During the projection of the Middle Creek-Dolly Varden chord, the axmen of the party had been cutting vista on the chords both east and west across the Middle Creek Valley. They completed the cutting on July 28.

The party then moved down the Chilliwack and up the Fraser Valley to Hope. Supplies, cement, and monuments had been delivered at Hope for the Skagit-Depot Creek section of the boundary, left uncompleted in 1905. An extra pack train was hired to help transport the party and supplies to the boundary on the Skagit River. Arriving at the Skagit crossing, the party worked westward, completing the vista cutting, building trails to the monument sites, and distributing material for the monuments. They also carried on phototopographic surveys and completed triangulation observations at stations "Whitworth" and "Glacier." Their work finished, they moved out by the way of Hope to Chilliwack, British Columbia, where they disbanded on October 1.

MAIN PARTY

What remained of the main party after the third subparty had been detached, continued trail building to Chilliwack Lake. Substantial bridges were constructed across tributary streams and the main stream was bridged again near the mouth of Middle Creek by felling a fir tree 9 feet in diameter across the stream.

The trail was completed to the foot of Chilliwack Lake on May 20. A cache was built and a large raft constructed to transport the party and supplies to the head of the lake. A search along the lake shore resulted in the finding of the cedar dugout used by the reconnaissance party of 1901. Using raft and canoe, party and outfit and two mules were transported to the head of the lake. From the head of the lake, the party moved with the two mules about a mile up Dolly Varden Creek to the vicinity of the boundary and camped.

A trail was cut up Depot Creek from its mouth to a junction at the boundary with the trail built from the Skagit River in 1905. The crew was able to work from the Dolly Varden camp by using the canoe between the head of the lake and the mouth of Depot Creek.

From the Dolly Varden camp the line was projected westward to meet the work of the third subparty, then eastward to Depot Creek, cairn 52 (now Monument 65). Trails were built to the intermediate monument sites; triangulation stations were selected, marked, and signaled; and the vista was cut along the boundary across the Dolly Varden Creek valley.

Seven monuments and the cement had been forwarded to the head of Chilliwack Lake. The chord to the west between cairns 50 and 49 was established on July 25. Everything being ready, a crew of five men was put at monument setting. Monuments now numbered 61, 62, 63, and 64 were set from the Dolly Varden Creek camp.

The entire party next moved by raft down Chilliwack Lake to the mouth of Depot Creek. Thence by back-packing and with the two mules, camp was moved up the Depot Creek trail to within a mile of the boundary. From this camp vista cutting was completed to the west from cairns 53 and 54 (now Monuments 66 and 67). The monumenting crew set Monuments 65, 66, and 67, present numbers.

The monumenting crew then took the two mules and moved eastward to meet the third subparty coming from the Skagit River. After obtaining additional pack horses from them, they set the monuments from Depot Creek to the Skagit River,



LOOKING NORTHEAST ACROSS MIDDLE CREEK FROM A POINT 1 MILE NORTHEAST OF BOUNDARY MONUMENT 56, CASCADE MOUNTAINS

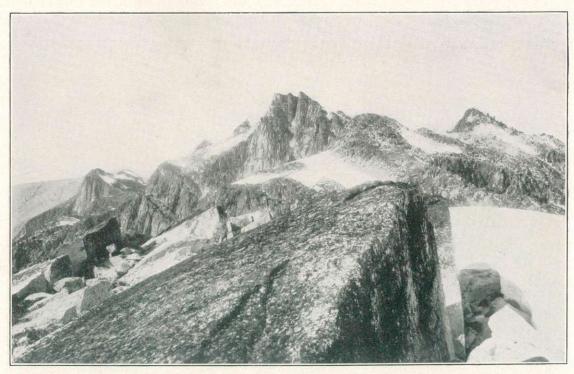
Nos. 65 to 71, inclusive. This was done by the time the third subparty completed its work, when they both moved out and disbanded on October 1 at Chilliwack.

The main party completed its work on Depot Creek on September 29. It then traveled by way of the Chilliwack Valley and up Silesia Creek to the boundary crossing of that stream. Here they cut the vista across the valley to timber line on each side, a distance of about 2 miles on the east and about 1 mile on the west side of the creek. The party finished work and started for McGuire's ranch on October 22, and after spending a day on the way in reinforcing the supports of the Tamihi bridge, reached the ranch and disbanded on October 25. This closed the field work for the season.

While there was no special topographic party in the field during the season, phototopography was carried on from the various camps as time and weather permitted.

At the beginning of the season, a triangulation party was organized. But work had no more than started when the observer in charge of the party, Mr. Howell Bigger, was stricken with a severe case of appendicitis. After being examined by a doctor in Sumas, he was sent to a hospital in Vancouver and operated on. The case was so far advanced, however, that in spite of every care he died a month later, on July 6.

It was not possible to secure an experienced observer to take the place of Mr. Bigger and continue the triangulation. The work was therefore postponed until the next season.



A HIGH PEAK OF THE CASCADE RANGE USED AS A PHOTOTOPOGRAPHIC STATION, 1 MILE EAST OF MIDDLE CREEK AND 1½ MILES NORTH OF BOUNDARY MONUMENT 58

The personnel of the Canadian party was: Chief of party, J. J. McArthur, D. L.S.; assistant in charge of triangulation, Howell Bigger, D. L. S.; assistants in charge of line projection, Noel J. Ogilvie, D. L. S., S. S. McDiarmid, D. L. S.; assistants in charge of vista and trail cutting, E. T. de Coeli, Stanley Everall; assistant in charge of monument setting, J. M. Sheppard; general assistant, W. P. Near; and 42 hands.

SEASON OF 1907—POINT ROBERTS TO THE SKAGIT RIVER; AND JOINT INSPECTION WEST OF THE ROCKY MOUNTAINS

The field operations during the season of 1907 included the virtual completion of the Point Roberts-Skagit River section of the boundary by Canadian parties and the inspection of monuments from Similkameen River to the summit of the Rocky Mountains by a joint United States and Canadian party.

CANADIAN PARTIES

An assistant was sent to Chilliwack, British Columbia, early in April to make preliminary arrangements for the Canadian parties. He employed several local men who had previously worked with the parties and proceeded to the Knox Ranch on Upper Sumas Prairie where the pack horses had been wintered.

The horses which were found to be in bad shape were taken off pasture and fed grain and hay to condition them for the season's work. The camp outfit was brought from McGuire's ranch where it had been stored, and camp was set up. Before the party had been entirely assembled, the spring flood of the Fraser River so overflowed the prairie that camp had to be moved back to the base of Vedder



TRIANGULATION STATION "MIDDLE", IN THE CASCADE MOUNTAINS, IS ON THE HIGH PEAK SEEN ON THE LEFT. VIEW FROM THE SOUTHWEST

Mountain. The final organization of the party was completed during the last week in April.

The full party consisted of 7 surveyors, 40 hands, and 28 pack horses. As in previous seasons, it was divided into several subparties.

TRIANGULATION SUBPARTY

A triangulation subparty was first detached with instructions to complete the triangulation begun and postponed in 1906, and to connect with the triangulation of the United States Geological Survey parties which had been carried eastward from Blaine and Bellingham, Washington. After three stations had been occupied, the large theodolite was so badly damaged by an accident that it could no longer be used. No other instrument of the same precision being readily available, the party observed with a 4-inch theodolite in order to furnish control for the topography being done by other parties. Although the party remained in the field the entire season, it was unable to furnish results of the required precision, and the completion of the work had to be postponed until 1908.

SECOND SUBPARTY

A second and larger subparty was formed at the organization camp and sent to Columbia Valley to begin cutting vista east on the chord from original Monument 43 to original boundary cairn 44 (now Monument 50). The forest growth was large and dense. The weather was so rainy and wet during the early part of the season that a full day's work was seldom possible. The boundary crossed canyons from 500 to 2,000 feet deep. Climbing up and down across these through the wet brush was so trying that axmen would not stay on the job. Under these adverse conditions the party made slow progress and it was not until September 15 that they joined the third subparty working west from Green Ridge. The party then returned to Columbia Valley where the axmen were paid off.

MAIN PARTY

Returning to the account of the main party at the organization camp at the base of Vedder Mountain: After the two subparties had been detached the main party moved around to the Chilliwack Valley and attempted to reach the boundary on Tamihi Creek. The spring freshets had carried out the bridge across the Chilliwack at the mouth of the Tamihi and the river was still so high it could neither be forded nor bridged. Of necessity a new trail was opened on the south side of the river through the Indian reservation and over a high mountain spur to the mouth of Tamihi Creek. This trail was used until the first of July. The river was then bridged a short distance below McGuire's ranch by felling a large tree across the deep channel to a gravel bar from which it was possible to ford to the farther shore.

The main wagon road up the Chilliwack was also found washed out at the "Big Slide." This obstruction necessitated the establishment of the supply camp well down the river at a point about 3 miles above the Vedder bridge.

When the detour trails had been completed the party made its way up the Tamihi Valley to the boundary. On this trip, also, trails were found badly washed, and in several instances completely obliterated by landslides.

At the boundary, the party was divided into a third and fourth subparty.

THIRD SUBPARTY

The third subparty went westward to Green Ridge (now marked by Monument 49), and began cutting the vista westward along the chord to meet the second subparty working east from Columbia Valley. The work was connected on September 15 and all moved out to Columbia Valley, where the axmen were paid off.

FOURTH SUBPARTY

The fourth subparty cut the vista from original boundary cairn 46 (now Monument 52) west to Green Ridge (Monument 49) where the third subparty had started. Monuments now numbered 50 to 54, inclusive, were set. Thereafter, the party was merged with the monumenting and topographic parties.

MONUMENTING PARTIES

In addition to the subparties whose work has been described, a monumenting party, early in the season, set monuments on the Middle Creek and Silesia Creek sections of the boundary from Monument 55 to Monument 60 (present numbers), inclusive, and then when enlarged by the fourth subparty, set Monuments 21 to 49 (present numbers), inclusive, which were all in place by September 20.



A VIEW OF THE SUMMITS OF THE CASCADE MOUNTAINS, LOOKING EAST ACROSS THE VALLEY OF SILESIA CREEK FROM TRIANGULATION STATION "RED" ON THE SUMMIT OF RED MOUNTAIN

There still remained to be set Monuments 9 to 20, inclusive, and Monuments 2 to 4, inclusive, on Point Roberts. A party, accompanied by a topographic subparty of three men, was sent west to set Monuments 9 to 20 and to acquire additional topographic data, and a second party was sent to Point Roberts to set the three monuments there and to recut the vista. These parties, the last to leave the field, finished work on October 20 and returned to Huntingdon, British Columbia, where they disbanded.

As in the previous season, no special topographic party was in the field, but topography was carried on from other camps. The data thus secured furnished all information necessary to complete the maps from the Skagit River to Point Roberts.

Early in August the Commissioners made a joint visit to the parties. An examination of the boundary across Columbia Valley was made, and after a trip up Tamihi Creek, Monuments 50 to 52, which had been set in place of original cairns 44, 45, and 46, were inspected. The Commissioners satisfied themselves that the original line had been recovered at lost cairns 44 and 45.

The Canadian parties, during the season of 1907, completed all work planned except a small amount of triangulation. This triangulation, though needed in the adjustment and computation of the general scheme of triangulation, was not essential to the reestablishment and monumenting of the boundary on the ground. There remained only a joint inspection of the work of the separate United States and Canadian parties. This inspection was already under way.

The personnel of the Canadian parties was: Chief of party, J. J. McArthur, D. L. S.; assistant in charge of triangulation, F. H. Mackie, D. L. S.; assistants in charge of line work and vista cutting, S. S. McDiarmid, D. L. S., E. T. de Coeli, C. R. Westland; assistant in charge of monument setting, J. M. Sheppard; foreman, Stanley Everall; and 40 hands.

JOINT INSPECTION PARTY

By the end of 1906, the reestablishment and remonumenting of the 49th parallel boundary west of the summit of the Rocky Mountains had been fully completed from the Skagit River to the summit of the Rocky Mountains and it was expected that the remainder of the work from the Skagit River to Point Roberts would be completed during the season of 1907. Three-fourths of this boundary was ready for joint inspection and the other fourth would shortly be ready.

In order that the joint inspection might follow as closely as possible upon the completion of the reestablishment of the line, the Commissioners laid plans to begin the inspection in the spring of 1907. In accordance with these plans, a joint inspection party was organized at Laurier, Washington, about the middle of June. As organized, the party consisted of a representative of each Government and 5 hands, with a train of 21 saddle and pack horses.

The instructions to the party were that they were to inspect the reestablishment, marking, and remonumenting of the line; to visit each and every monument; to number the monuments from No. 1 consecutively to the eastward by attaching

to each the number plate, bearing its proper number, 16 and to photograph and make a written description of each monument.

The actual work of inspection was begun on June 27. On account of snow still lying on the higher mountains, the party began at Laurier and worked west across the comparatively low country to the east side of Osoyoos Lake, where on July 10 they inspected and numbered Monument 118. On this section of the line the inspection revealed no discrepancies or damage to monuments requiring correction other than a broken center rod in Monument 158 south of Grand Forks, British Columbia. The monument was repaired by fastening the sections together with screws inserted into tapped holes drilled through the overlaps of the sections.

By the time Osoyoos Lake was reached the season was sufficiently advanced to permit travel in the high mountains. Up to this time the character of the country had permitted the use of wagons for moving camp but now it was necessary to abandon the wagons for the pack train. Preparations for moving east from Laurier were completed on July 17.

The party moved across the Kettle River, inspected the line, and numbered the monuments between the Kettle and Columbia Rivers. This was completed on July 25.

Upon reaching the Columbia River the party encountered the usual difficulty of those days in crossing. The pack train was sent up the river to Trail, British Columbia, to cross on the ferry so as to be on the north side of Clark Fork (Pendd'Oreille) River. At Trail the ferry was found to be in disrepair and not in operation. Upon appeal, the mayor of Trail called a special meeting of the town council to appropriate money for repairing the ferry. At the end of four days repairs had been made and the pack train crossed the river. It reached Waneta on the north bank of Clark Fork on July 30.

While the pack train was moving around by way of Trail, the line was inspected between the Columbia River and the Clark Fork crossings, by using horses hired at Boundary, Washington, on the south side of Clark Fork. On this trip Monument 183 was found to have a broken center rod. It was repaired in the same manner as Monument 158.

On August 1 the party started eastward on the inspection from Clark Fork to the west crossing of the Kootenai. Several delays and untoward incidents occurred—many windfalls blocked the trails; a thunder storm accompanied by hail and snow kept the party in camp all one day; a pack horse carrying the cook stove lost her footing on a rocky piece of trail and rolled 200 feet down the hill through tangled brush and windfalls. Strange to say, neither horse nor pack was seriously injured, but it required a day's work to cut a trail by which to recover them. On another occasion one of the axmen employed in clearing the trail ahead of the pack train cut his foot across the instep so seriously that he had to be taken out some 18 miles over the trail to a doctor for treatment. This delayed the party for two days. The party finally reached Porthill at the west crossing of the Kootenai on August 21.

They remained at Porthill reoutfitting and having horses shod until August 24, then moved eastward to Round Prairie. The horses strayed from this camp and

¹⁶ See typical monument, p. 120.

were not recovered until the 28th. No time was lost on this account, however, as the time was spent inspecting the nearby boundary and monuments on foot.

From Round Prairie the party continued along the line eastward, interrupted from time to time by rain, snow, and hailstorms, by the necessity of reopening the trails blocked by windfalls, and on one occasion by a pack horse dropping dead on the trail. Gateway, Montana, was reached on September 19.

At Gateway, time was taken to have the horses reshod and to make arrangements to have supplies sent by wagon from Belton, Montana, up the Flathead Valley to the boundary to save packing across the mountains.

On September 26 the party moved east from Gateway carrying on the inspection toward the Flathead River. They were traveling light on this trip, and, the trails being in fair condition, good progress was made. On September 29 they passed Frozen Lake and inspected Monuments 257, 258, and 259. Monument 258 was found to have a broken rod; it was repaired in the same manner as the other two found in like condition. That evening, September 29, the party crossed Hefty Pass at an elevation of 7,300 feet and made camp in the cove below it overlooking the beautiful Flathead Valley. The danger of being trapped in the mountains by heavy snows was past.

The Flathead was crossed on September 30 four miles south of the boundary and camp made at the old base camp of previous seasons. Working eastward toward the summit of the Rocky Mountains, camps were made at Lower Kintla Lake and at the grass-covered slide under the Sawtooth or Boundary Mountains. From these camps and one side camp, the climbs were made to the monuments on the high peaks of the Rockies until Monument 272 on the summit of the Rocky Mountains was reached on October 8. The next day the party moved down the Flathead to Round Prairie, where the horses were left for the winter. The camp outfit was hauled to Belton and shipped to Gateway to be placed in storage. The party was then disbanded.

During the season the party inspected 242 miles of the boundary from Monument 118 on the east bank of Osoyoos Lake to Monument 272 on the summit of the Rocky Mountains. All of the 155 monuments (118 to 272, inclusive) were visited. All monuments, including their cement bases, were found in good condition except three, numbers 158, 183, and 258. In these three the center rod had been broken. Sufficient examinations and tests were made to convince the inspectors that the boundary had been properly retraced and that all of the monuments were properly placed on original sites or on straight lines between original sites. In accomplishing this inspection, the camp had been moved 800 miles by wagon and pack train, and the inspectors had traveled 1,400 miles on foot and on horseback.

Upon completion of the inspection, the inspectors submitted jointly written and jointly signed reports of their work to their respective Commissioners.

The personnel of the joint inspection party of 1907 was as follows: Inspector on the part of Canada, Noel J. Ogilvie, D. L. S.; inspector on the part of the United States, C. H. Sinclair; and 5 hands.

SEASON OF 1908—CONCLUSION OF WORK WEST OF THE ROCKY MOUNTAINS; AND THE BOUNDARY FROM COUTTS, ALBERTA, 100 MILES EASTWARD TO LODGE CREEK

During the season of 1908 field work was brought to a conclusion, for the time being, on the boundary west of the summit of the Rocky Mountains and work was taken up on the section east of the summit of the Rocky Mountains.

THE BOUNDARY WEST OF THE SUMMIT OF THE ROCKY MOUNTAINS

West of the summit of the Rocky Mountains a small Canadian party was engaged in triangulation and topographic surveys, and a joint party completed the inspection begun in 1907.

The triangulation and topographic party closed a gap in the boundary triangulation between the line "Whitworth-Glacier", just west of the Skagit River, and International Boundary Monument 31, near Sumas, Washington, and while engaged in this work did some phototopographic work in the valley of the Chilliwack River north of the boundary in the interest of geologic research for the Canadian Government. This party was in the field from May 10 to September 15.

The officers in charge were: Assistant in charge of triangulation, E. T. de Coeli;

assistant in charge of topography, Charles Courtman.

The joint inspection party began at Monument 117 on the west bank of Osoyoos Lake, and worked westward to Monument 1 on Point Roberts. A joint report was then submitted to the respective Commissioners to the effect that the boundary was satisfactorily marked. The party was in the field from early in June to October 1st.

The inspecting officers were the same as for 1907: For the United States, C. H. Sinclair; for Canada, Noel J. Ogilvie, D. L. S.

The work of the two parties just described completed the reestablishment and remonumenting of the 49th parallel boundary west of the summit of the Rocky Mountains. The boundary line had now been reestablished, surveyed, monumented, and inspected from the summit of the Rocky Mountains to Georgia Strait. The difficulties had been tremendous. Land and water had done their utmost to impede the progress of the surveyors. Forest fires raging through the mountains had endangered the lives of man and beast. A way had to be hewn through trackless forest; raging floods had to be crossed. Supplies had to be brought to camps over dangerous trails, and monuments and cement packed or hoisted to sharp crags so that the surveyor of the future could take his line from one monument to another. Through it all the surveyors of the two Governments worked separately but in cooperation on terms of friendly comradeship. Every man has reason to review with pride the part he played.

THE BOUNDARY EAST OF THE SUMMIT OF THE ROCKY MOUNTAINS

Work on the 49th parallel boundary east of the summit of the Rocky Mountains was initiated by a Canadian party. No United States party was engaged

on this part of the boundary in 1908. The Canadian party was, however, accompanied by a representative of the United States.

CANADIAN PARTY

To the Canadian party had been assigned the section of the boundary from Coutts, Alberta (Sweetgrass, Montana), eastward to Frenchman Creek. They began work in the vicinity of Coutts, Alberta, at original cairn 356 (now Monument 331), designated in the original report as "Red Creek astronomical station", and worked east for a distance of about 100 miles to original cairn 325 (now Monument 403), originally designated "West Fork astronomical station", at the crossing of Lodge Creek a few miles east of the Alberta-Saskatchewan boundary. The work of the party was as follows:

A base was measured along the railroad track at Coutts and from it a scheme of triangulation was expanded and carried eastward along the boundary for the purpose of controlling the topographic mapping and measurements. The monuments were tied in to the triangulation to later make possible the computation of their geodetic positions. A topographic survey, showing 20-foot contours, was made for a distance of 1 mile on each side of the line throughout the whole distance. Elevations, based on a railroad bench mark at Coutts, were determined by running level lines along the boundary from monument to monument.

The original cairns, after being identified, were connected by surveys which established straight lines between the consecutive marks from which offsets to the curve of the parallel could be made. Sites for additional monuments were selected and marked on the curve of the parallel, and their distances from the original marks were determined either by triangulation or by traverse, as was more practicable. No new monuments were set, owing to the fact that the survey was begun so soon after authorization by the treaty that new monuments (cast-iron) could not be procured in time for installation in connection with the other work.

At the beginning of the season the work of the party was seriously hampered by weather conditions. A violent rain and sleet storm beginning on May 29, and lasting 3 days, flooded the streams, washed out bridges, and damaged or destroyed dwelling houses on the low lands. Traffic was interrupted for 10 days, and but little work could be carried on. The flood was followed by a plague of mosquitoes that made camp life and work in the open an exquisite torture.

The party was in the field from May 10 to September 25.

The personnel of this Canadian party in 1908 was: Chief of party, J. J. Mc-Arthur, D. L. S.; assistants, Orville Sills, J. L. Goodwin, J. M. Sheppard, George S. Raley, F. P. Steers, W. B. Cole, E. J. Linegar, O. R. Forsythe, J. M. Perrier, and J. A. Snow; United States representative, F. D. Granger.

SEASON OF 1909—FROM THE SUMMIT OF THE ROCKY MOUNTAINS EASTWARD TO FRENCHMAN CREEK

During the season of 1909 the Canadian parties continued to completion the field work on their section of the boundary, from Coutts, Alberta, eastward to Frenchman Creek, on which they had made a good start in 1908. A United States

party began on the 90-mile section of the boundary from the summit of the Rocky Mountains to Coutts.

CANADIAN PARTY

The Canadian party reassembled at Coutts, taking up the monumenting which had been necessarily deferred the previous year. The major efforts of the party were directed to that work until all the monuments had been set on the section of the line from Coutts to Lodge Creek.

While the monumenting was going on, all sites for intermediate monuments were rechecked for correct position on the curve of the parallel, and a line of levels was run from Coutts north along the railroad to connect with the irrigation level



SETTING A CAST-IRON BOUNDARY MONUMENT IN THE PRAIRIE COUNTRY

lines on Milk River so as to base the boundary levels on a more reliable datum than that of the railway elevations at Coutts used the previous year.

When the monumenting was completed to Lodge Creek, triangulation, leveling, mapping, and establishing sites for intermediate

monuments on the parallel between original cairns were resumed and closely followed by the monumenting. By the end of the season the objective at original boundary cairn 290 (now Monument 478) on the west side of Frenchman Creek was reached.

The progress of the work throughout the season was very satisfactory. The most serious difficulty met with was the crossing of Milk River. The boundary crosses the stream, in the bottom of a deep canyon, five times in as many miles. The river was in flood, the banks were precipitous, and the bed of the stream a deep quicksand. At the first ford two days were spent in grading the banks and laying a brush mattress over the quicksand. Even after this preparation, several horses narrowly escaped drowning. After this experience the other crossings were avoided by grading a road along the hillside on the north side of the river.

Upon the termination of the field work, all of the party equipment was moved 200 miles eastward along the boundary to Marienthal, Saskatchewan, to be ready for the next season on the second section of the boundary assigned to Canadian parties.

The party was in the field from early in May until November 10.

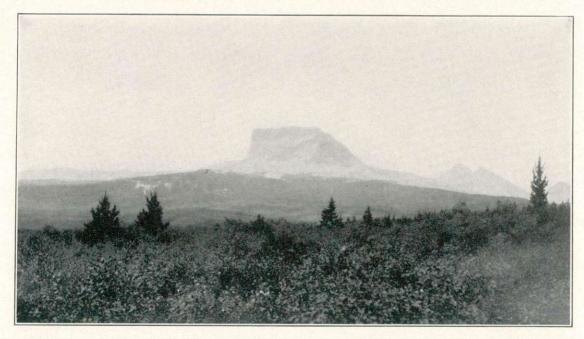
The party was constituted as follows: Chief of party, J. J. McArthur, D. L. S.; assistants, F. P. Steers, A. C. Young, J. L. Goodwin, J. M. Sheppard, W. B. Cole, G. S. Raley, O. R. Forsythe, J. M. Perrier, J. A. Snow, E. J. Linegar, and E. T. de Coeli; United States representative, F. D. Granger.

UNITED STATES PARTY

The United States party was organized and equipped at Browning, Montana, some 40 miles by wagon road south of the boundary, and moved to Galbreath's ranch adjoining the boundary about 5 miles east of St. Mary River.

While waiting for snow in the high mountains to melt and consequent high waters in the streams to recede, most of the necessary surveys were made between St. Mary River and the North Fork of Milk River. As the season advanced work was carried westward to the summit of the mountains. The results consisted of the recovery and identification of the original boundary cairns; the running of chords between the original cairns and the establishment of new or intermediate monument sites on the curve of the parallel as determined by offsets from the chords; the development of a scheme of triangulation for the determination of the geographic positions of the monuments and for the horizontal control of the topographic mapping; the running of levels for the vertical control of the mapping; the topographic mapping of the terrain adjacent to the boundary; the cutting of the boundary vista through timber from the summit of the Rocky Mountains for a distance of about 24 miles to the open prairie country; and the setting of the new boundary monuments. By the end of the season all of this had been completed to the North Fork of Milk River, a distance of about 50 miles.

The party was in the field from early in May until the middle of October. The personnel was as follows: Chiefs of party, E. C. Barnard and C. H. Sinclair; assistants, D. F. C. Moor, E. R. Martin, P. T. Bailey, R. V. Utter, J. S. Siebert, and C. W. Sterling; Canadian representative, M. F. Cochrane, D. L. S.



CHIEF MOUNTAIN, THE MOST EASTERLY PEAK OF THE ROCKY MOUNTAINS IN THE VICINITY OF THE INTERNATIONAL BOUNDARY. IT MARKS AN ANGLE POINT OF THE EASTERN BOUNDARY OF GLACIER NATIONAL PARK

SEASON OF 1910—FROM THE NORTH FORK OF MILK RIVER TO COUTTS, ALBERTA; FROM FRENCHMAN CREEK TO THE MIDDLE FORK OF POPLAR RIVER; AND FROM THE WEST BRANCH OF SHORT CREEK TO THE EAST SLOPE OF THE TURTLE MOUNTAINS

During the season of 1910, field work was carried on by a Canadian party and by a United States party as in the previous year.

CANADIAN PARTY

The Canadian party operated on the second section of the boundary assigned to them, from the West Branch of Short Creek to the west bank of Red River. Work commenced at original mound 219 (now Monument 620) near the West Branch of Short Creek, and during the season was completed eastward about 138 miles to the eastern slope of the Turtle Mountains.

The work of the party, as in the two previous years, included: Recovery and identification of the old cairns and mounds; establishment of additional monument sites on the curve of the parallel between original marks; triangulation and level lines; topographic mapping; the setting of new monuments; and the cutting of a 20-foot boundary vista through the timbered areas of the Turtle Mountains for a distance of about 34 miles.

The survey was completed to original mound 170 (now Monument 718) and remonumenting was completed to original mound 172 (now Monument 714).

The Turtle Mountains comprise an irregular mass of hills rising approximately 500 feet above the surrounding prairie. This difference in altitude is sufficient to cause a precipitation greatly in excess of that of the surrounding country, and sufficient to support forest growth. The depressions among these well-wooded hills and ridges are occupied by numerous swamps and lakes. Throughout this section the original earth mounds marking the boundary were found hidden under a cover of briars, vines, and small saplings. In order to find the mounds it was frequently necessary to run a trial line ahead from the last known mound, cutting a narrow vista through the forest, and measuring the required distance. The difficulties of travel through the brush and timber and the necessity for cutting lines of sight and vista made the progress through this area very slow in comparison with that on the open prairie.

The party was in the field from May 8 to November 7.

The personnel for the season was as follows: Chief of party, J. J. McArthur, D. L. S.; assistants, F. P. Steers, J. M. Sheppard, G. S. Raley, W. B. Cole, E. T. de Coeli, E. J. Linegar, J. M. Perrier, and J. A. Snow; United States representative, F. D. Granger.

UNITED STATES PARTY

The United States party completed the field work begun by them in 1909 on the boundary from the summit of the Rocky Mountains to Coutts, Alberta, where a junction was made with the work previously carried eastward from that point by the Canadian party. The United States party then moved about 200 miles east to original cairn 290 (now Monument 478) on Frenchman Creek and began work on the second section assigned to them. On this second section they completed the field work from original cairn 290 on Frenchman Creek to original mound 262 (now Monument 530) near the Middle Fork of Poplar River, a distance of about 80 miles.

In general, operations differed in no way from those of 1909, except that in this prairie country no vista had to be cut.

While in other seasons work had been interrupted by an excess of precipitation, in 1910 drouth was the cause of considerable delay. The exceptionally dry season, with only 26 percent of normal precipitation, made the country ready for prairie fires, always annoying and, at times, alarming. The first fire occurred while the party was yet on Frenchman Creek, and, coming from the east, endangered the main camp on Bluff Creek. The fire swept by the Bluff Creek camp, consuming everything in the vicinity. The camp was saved by the determined efforts of the teamsters with the loss of but two tents. Later in the season the work of triangulation was hampered by the smoke from a large fire 350 miles to the westward, and again by the smoke from the forest fire in the Rainy River country, which wiped out the towns of Baudette and Spooner, Minnesota, with a loss of 42 lives.

The prolonged drouth reduced the streams to a series of disconnected pools in which the water was strongly alkaline and unfit for drinking. Drinking water was obtained from holes dug near the pools. The water was thus improved by filtration through the soil, but it was still necessary to sterilize it by boiling.

The season lasted from May 26 to October 24.

The personnel of the United States party was as follows: Chiefs of party, E. C. Barnard and C. H. Sinclair; assistants, James H. Van Wagenen, E. R. Martin, C. W. Sterling, W. R. Winstead, J. S. Siebert, and R. K. Lynt; Canadian representative, T. H. G. Clunn, D. L. S.



FORDING THE SOURIS RIVER NEAR THE INTERNATIONAL BOUNDARY. NOTE THE BAGS ON THE HORSES' NOSES TO PROTECT THEM FROM THE VICIOUS "NOSE FLIES" OF THE PRAIRIES

SEASON OF 1911—FROM THE MIDDLE FORK OF POPLAR RIVER TO THE WEST BRANCH OF SHORT CREEK; AND FROM THE EAST SLOPE OF THE TURTLE MOUNTAINS TO RED RIVER

CANADIAN PARTY

The Canadian party began operations in 1911 on the east slope of the Turtle Mountains and worked east to Red River, the terminus of this section of boundary allotted to them. This completed the Canadians' share of the survey of the 49th parallel boundary. The work, in addition to the usual survey operations, included the completion of the cutting of the boundary vista on the east slope of the Turtle Mountains and the cutting of vista for 12 miles through the wooded area of the Pembina Mountains.

The season's work covered a part of the section of the boundary where the Commission of 1872–76 had marked the boundary with cast-iron monuments.



OBSERVING FROM A BOUNDARY MONUMENT. NOTE SPECIAL DEVICE FOR MOUNTING THE THEODOLITE

These had been placed at intervals of about 1 mile. Eighty-five of the castiron monuments (original numbers 70 to 154) were on this section of the boundary. About 27 percent of these monuments were found broken; many of the others were leaning and unstable. The broken ones were replaced by new cast-iron monuments and those in good condition were filled with concrete and reset in concrete bases. No additional or intermediate monuments were interpolated on this part of the line.

The season's work was seriously interfered with in September by an epidemic of typhoid. Fourteen of the party were affected and were sent to the hospital at Morden, Manitoba. Though several were seriously ill, there were fortunately no fatalities.

The party was in the field from April 27 to November 10.

The personnel of the party for the season was: Chief of party, J. J. McArthur, D. L. S.; assistants, J. W. Menzies, D. L. S., F. P. Steers, J. M. Sheppard, G. S. Raley, Charles Courtman, Fred Fulford, E. J. Linegar, J. M. Perrier, and J. A. Snow; United States representative, F. D. Granger.

UNITED STATES PARTY

The United States party began work in the spring of 1911 at the Middle Fork of Poplar River where they had discontinued work at the close of the season of 1910. All phases of the work were carried on simultaneously as in the past two years. The surveys and monumenting were completed to original mound 219 (now Monument 620), the end of the allotted section of boundary, where a junction was made with the work of the Canadian parties.

In addition to the above, the chief of party in charge of topographic work made a trip west of the summit of the Rocky Mountains and made some additional topographic surveys along the boundary on Point Roberts; between Blaine and Sumas, Washington; in the vicinity of Ferry and Molson, Washington; at Midway and at Myncaster, British Columbia; and at Eastport, Idaho, to bring the maps up to date, more particularly to show the highways and railroads constructed since the boundary surveys had been made.

At the close of the season the camp equipment was moved to Pembina on the Red River to be ready for work east of that point.

The work of this party, like that of the Canadians, was interrupted by sickness.

A teamster contracted smallpox. The camp was quarantined and all of the men in camp underwent vaccination. These measures prevented the spread of the disease, but the quarantine and sore arms of the vaccinated delayed work to a considerable extent.

The party was in the field from May 12 to October 14.

The personnel of the party was: Chiefs of party, E. C. Barnard and C. H. Sinclair; assistants, James H. Van Wagenen, E. R. Martin, Jesse Hill, C. W. Sterling, E. V. Perkinson, R. V. Utter, and R. K. Lynt; Canadian representative, George White-Fraser, D. T. S.



A BIT OF OLD EUROPE TRANSPLANTED TO MANITOBA NEAR THE

SEASON OF 1912—FROM RED RIVER TO LAKE OF THE WOODS; THE MERIDIAN LINE; AND MEASUREMENT OF BASES, ROCKY MOUNTAINS TO LAKE OF THE WOODS

During the season of 1912 the field work on the boundary from Georgia Strait to the Northwesternmost Point of Lake of the Woods was carried on entirely by United States parties.

At the beginning of the season the field work on the boundary from Red River to the Northwesternmost Point of Lake of the Woods, assigned to United States



A TRIANGULATION STATION TOWER ON THE MINNESOTA-MANITOBA BOUNDARY. SUCH TOWERS WERE OFTEN NECESSARY TO SEE OVER THE SURROUNDING FORESTS

parties by the Commissioners, still remained to be done. Also, it had been found by office computation that the triangulation from the summit of the Rocky Mountains to Red River needed strengthening by the measurement of additional base lines.

The additional base lines were measured by a special party. They not only measured new bases, but remeasured several bases laid out and measured at the time the triangulation was observed. In all, 15 bases, between the Rocky Mountains and the Red River, were measured and tied in to the triangulation. An additional base was measured near Warroad, Minnesota.

The base-measuring party was in the field from June 1 to August 26.

The section of the boundary from Red River to the Northwesternmost Point of Lake of the Woods, passing through large swampy and timbered areas, presented difficulties in transportation which necessitated changing to some extent the method and procedure used in the open prairie country to the westward.

Movement by team and wagon along the boundary was impossible in the swamps during the summer season.

Anticipating this difficulty, a small party was sent out early in February to distribute monumenting material across the frozen swamps between Red River and Lake of the Woods. Teams and sleds were used. The cast-iron monuments, sand, and gravel were delivered at the monument sites and piled on rafts, made from poles, to keep them from sinking into the ooze when the swamps thawed. These preparations were finished in March.

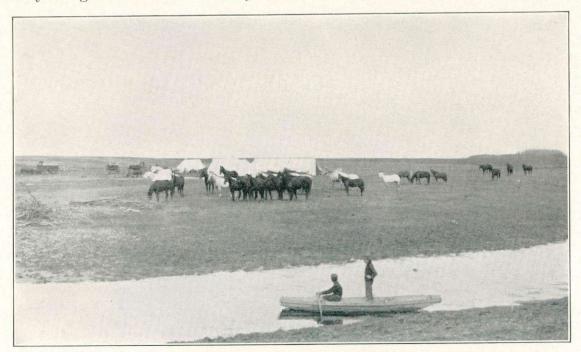
The general survey was begun early in May at the Red River where the Canadian party had ended their work in 1911.

Upon entering the timbered swamps a few miles east of Red River, triangulation had to be carried forward from tall towers built so as to see over the tops of the timber. Many of the monuments in this area had to be located by traverse, and a continuous vista had to be cut along the line. Special methods had to be devised for running accurate levels through the swamps and for making accurate topographic surveys. All of the work was very much hampered by the difficulties of transportation and travel. Camp could not be moved along the line but had to be taken north several miles to a branch of the Canadian Northern (now Canadian National) Railway paralleling the boundary, thence eastward on the railroad, thence back to the boundary on some convenient sand ridge extending southward. Before reaching Lake of the Woods horse transportation was abandoned and work done entirely on foot from camps on the railroad, which approaches and crosses the boundary on its route to the south end of the lake. Travel on foot through the swamps was so laborious and disagreeable that only with great difficulty could laborers be kept on the job.

Work on the 49th parallel boundary was completed, with the exception of a small amount of triangulation, on September 17, and the party, with the exception of the triangulation unit, was transferred to the meridian boundary. Launches and small flat-bottomed boats were procured for transportation on Lake of the Woods and for surveying and mapping its shores.

On September 20 the party was in camp on Harrison Creek, Northwest Angle Inlet, at original Monument 2 (now Monument 924).

An immediate start was made on clearing the vista and making a topographic survey along the meridian boundary south from criginal Monument 1 (now Monu-



A BOUNDARY COMMISSION SURVEY CAMP ON THE PRAIRIE EAST OF RED RIVER, 1912

ment 925) and on making a detailed topographic and hydrographic survey of the upper part of Northwest Angle Inlet from a point southeast of the northernmost monument of the meridian boundary to the Northwesternmost Point of Lake of the Woods.¹⁷ This work was completed as far south as the boundary crossing of Stony Creek by October 14. Weather conditions then became so severe as to prevent further work and the party on the meridian line withdrew from the field. Those engaged in triangulation on the 49th parallel boundary and two topographers mapping the shore line of Lake of the Woods remained in the field for a short time longer, the last leaving early in November.

The personnel of the United States party was: Chiefs of party, C. H. Sinclair, E. C. Barnard, O. B. French; assistants, James H. Van Wagenen, Jesse Hill, H. C. O. Clarke, E. V. Perkinson, R. K. Lynt, F. C. Warner, Hargraves Wood, W. V. Hagar, and E. R. Hand; Canadian representative, J. L. Rannie, D. L. S.

SEASON OF 1913—THE MERIDIAN LINE AND THE 49TH PARALLEL NEAR LAKE OF THE WOODS

The season of 1913 marked the conclusion of the field work of reestablishing and remonumenting the boundary from Georgia Strait to the Northwesternmost



BOATS WERE USED FOR TRANSPORTATION ON LAKE OF THE WOODS

Point of Lake of the Woods. As in the previous year, only United States parties were engaged.

The completion of the surveys of the 49th parallel boundary and the meridian line were so planned and arranged that they merged without interruption into the resurvey of the water boundary through Lake of the Woods and to the east.

The marshy character of the entire region along the eastern end of the 49th

parallel boundary and along the meridian boundary made it necessary to do much of the field work early in the season before the swamps thawed and the ice broke up on the lake. Accordingly, work was begun on January 2. A tote-road was opened along the meridian line and the cast-iron monuments, with the sand, gravel, and cement for setting them, were hauled by horse-drawn sleds from Warroad, Minnesota, over the frozen lake and the tote-road to the selected monument sites. Four monuments and the material for setting them were hauled over winter roads to sites on the 49th parallel boundary which had been impossible to reach with wagons the previous year.

¹⁷ See Commissioners' "Joint Report upon the Survey and Demarcation of the Boundary between the United States and Canada from the Northwesternmost Point of Lake of the Woods to Lake Superior", pages 39 to 41.

After the monumenting material had been delivered, and before the break-up of the ice, the boundary vista on the meridian line was completed southward to Lake of the Woods; the southern intersection of the meridian boundary with the boundary in the channel of the Northwest Angle Inlet was located and temporarily marked on the ice; marks on the shores for permanent reference were established; and a precise invar tape traverse was made of the meridian boundary. As the advance of spring weather permitted, monuments were set and the topography and triangulation were completed. This virtually completed the field work on the International Boundary from Georgia Strait to the Northwesternmost Point of Lake of the Woods. The last of the work was completed by May 1 and the parties engaged upon it were then merged with the organization for the survey of the water boundary to the east.

The personnel of the parties on the 49th parallel and the meridian boundaries was: Chiefs of party, E. C. Barnard, C. H. Sinclair; assistants, James H. Van Wagenen, Jesse Hill, E. R. Martin, H. C. O. Clarke, E. V. Perkinson, and R. K. Lynt.

SEASON OF 1914—NUMBERING THE MONUMENTS

It was not possible to place final numbers on the boundary monuments when they were set, for the reason that two independent parties were engaged at the same time in setting them on different sections of the line and neither party knew how many monuments were being placed by the other. Marking the numbers on the monuments was done in 1914. A party of three men with a camp wagon and an extra saddle horse started at the summit of the Rocky Mountains and worked eastward numbering the monuments as they went until the swamp country east of Red River was reached on November 7. The swamps were found so flooded by recent heavy rains that travel along the boundary was impossible. The party suspended operations and waited until the "freeze-up", when work was resumed and carried forward to the Northwesternmost Point of Lake of the Woods. All of the monuments, from number 272 on the summit of the Rocky Mountains to number 925, the most northern monument on the meridian line, were found in good condition with but one exception—Monument 906. This monument, standing in an open swamp, was found to be tilted a few inches from the perpendicular either from settling or from the action of frost. It was restored to its original perpendicular position and a load of rocks placed around the base for reinforcement. Monuments 911 and 912, in similar locations, were reinforced in like manner.

In addition to marking the monuments, the party did some triangulation on the eastern slope of the Rocky Mountains to more accurately determine the geographic positions of several boundary monuments. They also made remeasurements of a few distances between monuments on the eastern section of the 49th parallel boundary.

Work started June 6 and ended on December 14.

The engineer in charge was E. R. Martin.

SEASONS OF 1917 TO 1922—COMPLETION OF FIELD OPERATIONS UNDER THE PROVISIONS OF THE TREATY OF 1908

Although the reestablishment of the boundary line from the Gulf of Georgia (Georgia Strait) to the Northwesternmost Point of Lake of the Woods was virtually completed with the inspection and numbering of the monuments in 1914, office computations later showed the need of some additional surveys and inspections. The computations of geographic positions of monuments indicated that some of the monuments east of the summit of the Rocky Mountains, interpolated between original boundary marks, were not located as accurately on the curve of the parallel as seemed desirable to the Commissioners. The data for computing the geographic positions of the monuments were found to be inadequate in some instances. Certain checks on levels and on topography were required to assure the accuracy of the topographic maps.

Accordingly, small United States parties in 1917, 1918, 1919, and 1921 covered the greater part of the 49th parallel boundary east of the summit of the Rocky Mountains, making inspections, checks, and additional surveys, and moving a few monuments found to be slightly off line. In 1922 a joint United States and Canadian party did some additional work west of the summit of the Rocky Mountains.

The party of 1917 made an inspection of and perfected surveys of the boundary from Monument 333 at Sweetgrass, Montana, (Coutts, Alberta) to Monument 482 in the valley of Frenchman Creek and an inspection of Monuments 499 to 507.

From Monument 333 to Monument 482 a continuous transit-and-tape traverse was run from monument to monument and connected with the boundary triangulation at frequent intervals. The traverse also included the location of all road and stream crossings of the boundary and the location of all United States and Canadian section corner marks found on the line.

A stadia profile of the boundary line between monuments was run and vertical angles were observed between the monuments to check elevations. Several errors in the longitude of monuments were found, and three interpolated monuments, numbers 398, 400, and 481, were found to be several feet off the curve of the parallel between original boundary marks.

East of Frenchman Creek the examination of Monuments 499 to 507 showed that some error existed in the original triangulation by which the geographic positions of the monuments had been determined and that observations were needed to correct the errors. Attending circumstances, however, prevented the work

from being done at the time.

During the season of 1918, the party continued the work begun the year before. Beginning at Monument 535, they worked west to Monument 481, checking the locations of all of the monuments interpolated on the curve of the parallel between original boundary marks and making additional observations to correct several errors in their geographic positions. Monument 481, found in 1917 to be set south of the parallel, was moved to its proper place on the curve. Monuments 398 and 400, likewise found to be off the true boundary, were moved to their correct positions by a Canadian engineer.

Upon the completion of the work at Monument 481 in the valley of Frenchman Creek the party moved eastward to Monument 621 near the West Branch of Short Creek and from there carried work eastward to Monument 722, just east of the Turtle Mountains.

On the last section of the line the party checked the locations of the monuments on the curve of the parallel between original boundary marks; ran transit-and-tape traverse lines; did such triangulation as was necessary to tie all of the monuments to the triangulation; determined the elevations of boundary Monuments 694 to 720, in the Turtle Mountains, by running a line of levels along the boundary from a Geodetic Survey of Canada precise-level bench mark at Monument 693 to a like

bench mark at Monument 721; and made an inspection of the topography of the boundary maps.

During the season of 1919 the party carried on similar work from Monument 721 to Monument 832 on the west bank of Red River, moved two monuments, numbers 723 and 741, found to be several feet off the curve of the parallel between original boundary marks, and permanently marked a large number of boundary triangulation stations between Portal, North Dakota, and Red River in order to preserve the stations for future use.

In 1921 the party covered the section of boundary from Monument 334 at Sweetgrass-Coutts to Monument 272 on the summit of the Rocky Moutains.

On this section of the boundary, the locations of the monuments interpolated



A BOUNDARY LINE STATION ON A CEDAR STUMP BETWEEN MONUMENTS 6 AND 7

on the curve of the parallel between original boundary marks were checked. Several monuments were found to be incorrectly located and were moved to their true positions; necessary repairs were made to a number of monuments; and the triangulation for determining the geographic positions of the monuments was strengthened in many places by additional observations.

The party personnel for these four years was as follows: Chief of party, J. G. Hefty; assistant in 1919, R. K. Lynt; assistant in 1921, E. R. Martin.

In 1922 a joint United States and Canadian party recleared the boundary vista from Monument 1 on Point Roberts to Monument 43 at the base of the Cascade Mountains; repaired or rebuilt 16 badly damaged monuments; established two new monuments, Monument 5–A¹⁸ and Monument 19–A, at two important highway crossings; ran a transit-and-tape traverse from monument to monument along the

¹⁸ Monument 5-A has since been replaced by a pair of monuments of different design, see p. 112.

boundary from Monument 1 to Monument 4 and from Monument 5 to Monument 43; and did the necessary triangulation to tie the traverse lines to the boundary triangulation and to the first-order triangulation of the Geodetic Survey of Canada.

The party also recleared the boundary vista across the valley of the Similkameen River, across the valley of the Kettle River at Laurier, Washington, across the valley of the Kootenai River at Porthill, Idaho; and across the valley of the Kootenai River at Gateway, Montana.

No further field work was done on the boundary from Georgia Strait to the Northwesternmost Point of Lake of the Woods until maintenance was taken up

under the provisions of the treaty of 1925.

The personnel of the joint party in 1922 was: Chief of party for Canada, J. N. Ingersoll; chief of party for the United States, J. G. Hefty.

SEASON OF 1926 AND SUBSEQUENT THERETO—MAINTENANCE UNDER THE TREATY OF 1925

After the adoption of the treaty of 1925, maintenance on the boundary under the provisions of that treaty was carried on by the Commissioners at various places from Georgia Strait to the Northwesternmost Point of Lake of the Woods in the years 1926, 1928, and in each year thereafter.

In conjunction with maintenance, necessary triangulation was done west of the summit of the Rocky Mountains to complete the determination of geodetic positions of boundary monuments in accordance with the agreement of the Commissioners.¹⁹

In June 1926, at the request of the International Lions Clubs of Winnipeg, Manitoba, and Grand Forks, North Dakota, the Commissioners located a new boundary monument site in the vicinity of Emerson, Manitoba, on the west side of the highway west of Red River, leading from Grand Forks, North Dakota, to Winnipeg, Manitoba. This was done in accordance with article II of the treaty of 1925, on the straight-line course between Monument 832 and Monument 833. The International Lions Clubs erected the monument as a token of international good will and amity. The Commissioners approved the design and designated the monument "832–A." ²⁰

In 1928 the Commissioners carried on maintenance work on the boundary from the west shore of Point Roberts on Georgia Strait to the foot of the Cascade Mountains, and from Red River to Northwest Angle Inlet of Lake of the Woods.

On the west shore of Point Roberts two large range marks were erected to range the 49th parallel water boundary, a monument was erected to mark the terminus of the 49th parallel land boundary at high water mark, and Monument 1, the large stone monument on Point Roberts, was repaired by repointing the joints with cement mortar. From Monument 1 to Monument 39 the vista was again recleared through all forest areas and the monuments were inspected.

From Red River to Northwest Angle Inlet, Monuments 833 to 925 were inspected and those found damaged, 24 in number, were repaired; and the vista was

recleared through all forest and brush-grown areas.

¹⁹ See p. 27

²⁰ This monument was moved in 1929, see p. 107.

In 1929 the Commissioners established four new monuments on the 49th parallel boundary to mark the crossings of two important highways and moved one monument to a new site.

Two of the new monuments were set at Wild Horse, Alberta, to mark the crossing of the highway running from Havre, Montana, to Medicine Hat, Alberta. They were set on the straight-line course between Monument 388 and Monument 389, and were numbered 388–A and 388–B. The other two new monuments were set near Emerson, Manitoba, to mark the crossing of the main highway from Minneapolis, Minnesota, to Winnipeg, Manitoba. They were set, one on each side of the highway, on the straight-line course between Monuments 833 and 834 and were numbered 833–A and 833–B. The new monuments are of ornamental concrete of a special design adopted by the Commissioners for marking the boundary crossings of important international highways on all sections of the boundary.

Monument 832—A, the Lions Clubs monument set in 1926, was moved about 500 feet west and again set on the straight-line course of the boundary between Monuments 832 and 833. The reason for moving the monument was that the highway had been relocated 500 feet farther west and the monument was accordingly moved to the west side of the new location. The setting and moving of these monuments included

the necessary surveys for determining their geographic positions.

In 1930 the Commissioners carried on maintenance work along the 49th parallel boundary from Monument 108, just west of the Similkameen River, to Monument 169, a few miles east of the eastern crossing of the Kettle River, and at several intervals eastward to the eastern crossing of the Kootenai River at Gateway, Montana.

In the course of this maintenance work all of the monuments from Monument 108 to Monument 169, and Monuments 179, 180, 181, 206, 207, 208, 243, 244, and 245, the geographic positions of which had never been accurately determined, were connected by triangulation with the boundary triangulation scheme and it in turn was connected in several places with the first-order triangulation of the United States Coast and Geodetic Survey and the Geodetic Survey of Canada, thus making it possible to accurately compute the geographic positions of all these monuments on the North American datum of 1927.

Two new monuments of the standard ornamental concrete type were set to mark the boundary crossing of the Wenatchee-Penticton highway in the Okanogan Valley. These new monuments were set, one on each side of the highway, on the straight-line course of the boundary between Monument 116 and Monument 117 on the west side of Osoyoos Lake. They were numbered 116–A and 116–B. The boundary vista was recleared at several minor road and stream crossings where the original vista was so overgrown that the line could no longer be identified without resorting to surveys. About 8 miles of vista was recleared.

In 1931 the Commissioners established four new monuments on the 49th parallel boundary to mark the boundary crossing of two important international highways and determined the geographic positions of several boundary monuments on the North American datum of 1927.

Two of the new monuments were set to mark the boundary crossing of the main highway from Browning and Glacier Park, Montana, to Cardston and to Waterton Lakes Park, Alberta. These monuments were set, one on each side of the highway, on the straight-line course of the boundary between Monument 190 and Monument 191. The monuments were numbered 190–A and 190–B.

The other two new monuments established in 1931 were set to mark the boundary crossing of the highway from Northport, Washington, to Rossland, British Columbia. They were set, one on each side of the highway, on the straight-line course between Monument 174 and Monument 175. The new monuments were numbered 174–A and 174–B. In connection with the surveys for determining the geographic positions of Monuments 174–A and 174–B on the North American datum of 1927, the geographic positions of Monuments 174, 175, and 176, which had never been accurately determined, were connected to the same datum.

In 1932 the Commissioners did maintenance work on the 49th parallel boundary at the following places: In the valley of Kettle River between Monuments 165 and 166; in the valley of Clark Fork River (Pend-d'Oreille) between Monuments 187 and 190; in the valley of the east crossing of the Kootenai River from Monument 246 to Monument 248; through the Turtle Mountains from Monument 696 to Monument 720; and through the Pembina Mountains from Monument 784 to Monument 796.

In the Kettle River Valley two new monuments were erected to mark the boundary crossing of the Kettle River Valley highway at Laurier, Washington. These monuments were placed, one on each side of the highway, on the straight-line course between Monument 165 and Monument 166. The new monuments were numbered 165–A and 165–B.

In the valley of the Clark Fork River (Pend-d'Oreille) two new monuments were established to mark the boundary crossing of the Spokane-Nelson highway at the Canadian Customs port of Nelway. These monuments were set, one on each side of the highway, on the straight-line course between Monument 188 and Monument 189. These new monuments were numbered 188-A and 188-B. In connection with the geodetic surveys necessary to determine the geographic positions of Monuments 188-A and 188-B, the geographic positions of Monuments 188, 189, and 190, which had not before been accurately determined, were redetermined. Monument 187 and Monument 190, found with broken shafts, were repaired.

In the valley of the east crossing of the Kootenai River near Gateway, Montana, geodetic surveys were made to accurately determine the geographic positions, on the North American datum of 1927, of Monuments 246, 247, and 248, the positions of which had not before been accurately determined.

Through the Turtle Mountains from Monument 696 to Monument 720 the boundary vista was recleared through all timbered and brush-grown areas and two new boundary monuments were placed on the line. The two new monuments were established to mark the boundary crossing of the Canal-to-Canada Highway at the east entrance of the International Peace Garden. These monuments were set, one on each side of the highway, on the straight-line course between Monuments 711 and 712, and were numbered 711–A and 711–B.

Through the Pembina Mountains from Monument 784 to Monument 796 the vista was recleared.

In 1933, field work, including maintenance work and additional triangulation, was carried on by the Commissioners west of the summit of the Rocky Mountains, between the States of Washington and Montana and the Province of British Columbia.

On the Washington-British Columbia boundary, the work covered a 36-mile section from Monument 165, at Laurier, Washington, to Monument 184, on the summit of the ridge between the Columbia River and Clark Fork (Pend-d'Oreille) River, and a 27-mile section from Monument 5, at Blaine, Washington, east to Monument 39, at the foot of Vedder Mountain near Sumas, Washington. It also included geodetic surveys on Boundary Bay to determine the locations of sites for marks to be erected to range the course of the boundary across Boundary Bay.

On the 36-mile section of the line from Monument 165 to Monument 184 the boundary vista was recut, the monuments were inspected, and those found damaged were repaired. All monuments whose geodetic positions had not previously been determined were tied by triangulation to the first-order triangulation of the United States Coast and Geodetic Survey and the Geodetic Survey of Canada. A Canadian party was engaged on this work from July 14 to November 13.

On the 27-mile section from Monument 5 to Monument 39 the boundary vista was recleared and the monuments were inspected. The monuments required no repairs. This work was done by a Canadian party during the period August 11 to October 24.

On Boundary Bay surveys were made for locating sites for a pair of range marks to be erected on the east side of the bay to range the boundary westward across



TRIANGULATION SIGNAL ON A MOUNTAIN SUMMIT WHERE MATERIAL WAS SCARCE

the bay. The work was done by an engineer of the United States section of the Commission. It was begun in December and finished early the following year.

On the Montana-British Columbia boundary the work covered the 43-mile section of the line from Monument 248, a short distance east of Gateway, Montana, to Monument 272 at the summit of the Rocky Mountains. Here the vista was recut from Monument 252 to Monument 272; all of the boundary monuments were inspected and those found damaged were repaired. The geographic positions of all the monuments were determined by triangulation, connecting them with the existing schemes of triangulation paralleling the boundary. This work was carried out by two United States parties between June 15 and October 28.

In 1934 maintenance and additional geodetic work were carried over approximately 130 miles of the 49th parallel boundary. The sections of line covered in this season were: From Monument 206, near the west crossing of the Kootenai River, to Monument 252, a few miles east of the east crossing of the Kootenai River; from Monument 184, between the Columbia River and Clark Fork (Pendd'Oreille) River, to Monument 206; and the short piece of the line in the vicinity of Point Roberts and Blaine, Washington.

On the boundary from Monument 206 to Monument 252, the vista was recleared from Monument 239 to Monument 252 and across the valley of the Movie



LOCATING A RANGE MARK SITE IN BOUNDARY BAY, OFF BLAINE, WASHINGTON

River. The monuments were inspected and repaired from Monument 206 to Monument 252, and the geodetic positions of all monuments from Monument 206 eastward which had not been determined previously were connected by triangulation with the existing schemes paralleling the boundary. This work was done by United States parties during the period May 30 to October 23.

On the boundary from Monument 184 to Monument 206, the vista was recleared from Monument 184 to Monument 199; the monuments were inspected and repaired from Monument 184 to Monument 206, and the geodetic positions of all monuments from 184 to 206 not previously determined were connected with the existing schemes of triangulation paralleling the boundary. This work was done by a Canadian party during the period May 15 to October 23.

In the vicinity of Point Roberts and Blaine, Washington, a Canadian party recleared the vista and inspected the monuments across Point Roberts. The United States engineer who in December 1933 had begun surveys to locate sites for range marks, carried a scheme of triangulation across Boundary Bay from first-order

stations of the Geodetic Survey of Canada to accurately determine the geodetic positions of the range mark sites and the boundary monuments on each side of the bay.

Early in the year the two range marks ²¹ on the east side of Boundary Bay were built by contract, after competitive bidding, under the supervision of the United States Lighthouse Service.

²¹ For description of range marks see p. 124.

In 1935 maintenance and geodetic work on the 49th parallel boundary were confined to the section of the line which crosses the Cascade Mountains, where no inspection or maintenance work had been done since the completion of the resurvey and demarcation in 1908, and to the western section of the line in the vicinity of Point Roberts and Blaine, Washington, where frequent and conspicuous boundary marks are needed to meet the requirements of heavy traffic crossing the border.

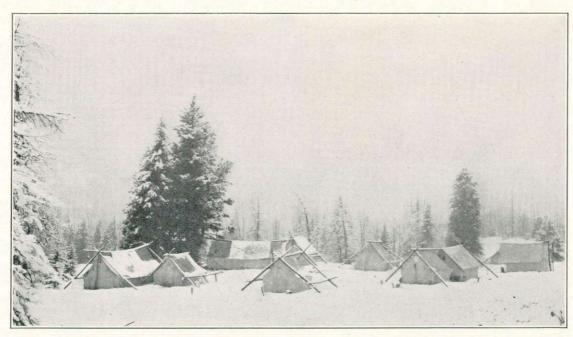
United States parties covered the 60-mile section of line between the Skagit and Similkameen Rivers. They inspected Monuments 73 to 108 and found them all in good condition, recleared the boundary vista where urgently needed, and determined the geodetic positions of Monuments 73 to 108 by triangulation based on the existing schemes of triangulation paralleling the boundary. The parties were in the field from June 10 to October 1.

Canadian parties covered the 50-mile section of line between Vedder Mountain, of the west foothills of the Cascade Range, to the valley of the Skagit River. They recleared the boundary vista across the summits of the timbered ridges marked by monuments, inspected and repaired as needed, Monuments 41 to 73, and determined the geodetic positions of Monuments 41 to 72 by triangulation based on the existing schemes of triangulation paralleling the boundary. The parties were in the field from May 15 to October 1.

On the western section of the line two range marks were built on Boundary Bay and several new monuments were established at highway crossings. This work was all carried out under the supervision of Canadian engineers.

The two range marks ²² were erected on the west side of Boundary Bay to supplement the pair erected on the east side of the bay in 1934 to range the 12-mile course of the boundary across the bay. They were erected early in the spring of

²² For description of range marks see p. 124.



A BOUNDARY COMMISSION SURVEY CAMP IN THE CASCADE MOUNTAINS DURING A SUMMER SNOWSTORM 122824°—37——9

1935. The work was done by a Canadian firm under contract let through competitive bidding, and was supervised by the Canadian Department of Public Works.

New highway monuments were established in the autumn of 1935 by a Canadian engineer. Two new monuments were set between Monuments 2 and 3 to mark the boundary crossing of the highway from Ladner, British Columbia, to the village of Point Roberts, Washington. These monuments were of the ornamental concrete type used to mark highway crossings. They were set on the boundary, one on each side of the highway, and were numbered 2–A and 2–B.

Two new monuments were set between Monuments 3 and 4 to mark the boundary crossing of the highway from Ladner, British Columbia, where it enters the village of Boundary Bay, Washington. These monuments were of the ornamental concrete type used to mark highway crossings. They were set on the boundary, one on each side of the highway, and were numbered 3–A and 3–B.

One new monument was set and one intermediate monument was replaced between Monuments 5 and 6 to mark the boundary crossing of the east highway from Blaine, Washington, to New Westminster and other cities and towns in British Columbia. This highway crossing of the boundary had been marked by a single concrete monument of individual design numbered 5–A, set on the west side of the road in 1922. The monument was removed and was replaced by an ornamental concrete monument of the type now used at highway crossings. A like monument was set on the boundary on the east side of the highway. These monuments were numbered 5–E and 5–F, leaving the letters A, B, C, D for probable future use between these monuments and Monument 5.

Two new monuments were set between Monuments 31 and 32 to mark the boundary crossing on the main street between the towns of Huntingdon, British Columbia, and Sumas, Washington. These monuments had to be set within the traveled way of side streets, which necessitated the use of a surface type of monument. They are concrete piers set with their top surfaces flush with the street. In the center of the surface of each pier, a 3-inch bronze disk is sunk, on which the exact boundary is marked by a line; and stamped on the appropriate sides of the line are the words "UNITED STATES" and "CANADA."

In 1936 maintenance work on the 49th parallel boundary was carried on west of the summit of the Rocky Mountains by United States and by Canadian parties.

The United States parties recleared the boundary vista through all timbered areas from Monument 199 to Monument 239, amounting to approximately 62 miles of the 67 miles between these two monuments. They also set two new monuments at Eastport, Idaho—Kingsgate, British Columbia, to mark the boundary at the crossing of the highway which runs from Bonners Ferry, Idaho, to Cranbrook, British Columbia. These monuments were of the ornamental concrete type used to mark highway crossings. They were set on the boundary, one on each side of the highway, and were numbered 216–A and 216–B.

The Canadian parties were engaged on the section of the boundary from Monument 5 at Blaine, Washington, to Monument 73 just east of the Skagit River. They recut the boundary vista through all timbered areas from Monument 41 to Monument 73, amounting to approximately 35 miles of the 50 miles between the two monuments. The Canadian parties also set 5 new monuments. They set a

monument of the conical bronze type at a point that had originally been selected as the site for Monument 45, but at which a monument had not heretofore been set. This new monument was numbered 45, and the monument originally set ½ mile to the westward and numbered 45 was renumbered 44–A. At Blaine, Washington, they set 4 new monuments to mark the boundary at the crossing of the Pacific Highway. Two of these four were set on the boundary, one on each side of the roadway passing the west side of the Peace Portal, and two were set on the boundary, one on each side of the roadway passing the east side of the Peace Portal. These monuments were of the ornamental concrete type used to mark highway crossings. They were numbered, from west to east, 5–A, 5–B, 5–C, and 5–D.

The field work of 1930 to 1936, inclusive, covered the entire section of the boundary west of the Rocky Mountains. During this 7-year period all of the boundary monuments were inspected and many repairs made; a large portion of the vista was recut; new monuments were set; and the work of determining the geodetic positions of all of the monuments was completed, making it now possible to describe the entire boundary from Georgia Strait to the Northwesternmost Point of Lake of the Woods in terms of geodetic positions as other sections of the boundary have been described in the reports of the Commissioners.

All of the field work subsequent to 1925, described in the foregoing paragraphs, has been reported upon in detail in the several annual joint reports of the Commissioners upon maintenance work submitted by them in duplicate to their respective Governments in accordance with the provisions of article IV of the treaty of 1925



THE PEACE PORTAL; ON THE INTERNATIONAL BOUNDARY AT THE CROSSING OF THE PACIFIC HIGHWAY ON THE EAST SHORE OF BOUNDARY BAY AT THE NORTH LIMITS OF BLAINE, WASHINGTON; ERECTED BY THE PACIFIC HIGHWAY ASSOCIATION UNDER THE DIRECTION OF THE LATE SAMUEL W. HILL. THE MONUMENT IS IN COMMEMORATION OF THE TREATY OF GHENT, SIGNED DECEMBER 24, 1814, SINCE WHICH TIME PEACE HAS BEEN KEPT BETWEEN THE TWO NATIONS WITHOUT ARMED FORCES OR FORTIFICATIONS ALONG THEIR COMMON BORDER. THE MONUMENT WAS BEGUN IN 1914 AND WAS COMPLETED AND DEDICATED IN 1921

FIELD AND OFFICE METHODS AND RESULTS

HORIZONTAL CONTROL

The horizontal control for the topographic surveys and for the determination of the geographic positions of the monuments marking the boundary line from the shore of Georgia Strait to the Northwesternmost Point of Lake of the Woods consists of a belt of major triangulation supplemented by schemes of minor triangulation and traverse. This belt of triangulation and traverse is controlled by the arc of first-order triangulation and traverse of the United States Coast and Geodetic Survey and the Geodetic Survey of Canada extending along the International Boundary from the Pacific Ocean to Lake Superior.

The general plan of control is shown on the 30 triangulation sketches on pages

428 to 457 of appendix V.

The geographic positions and descriptions of the triangulation and traverse

stations are listed in appendix V pages 254 to 427.

The first-order control is an arc of the western net of first-order triangulation, readjusted by the United States Coast and Geodetic Survey to establish the North

American geodetic datum of 1927.

The major triangulation of the boundary survey is an almost continuous belt of triangulation paralleling or straddling the boundary from Point Roberts to Lake of the Woods. It has been tied in, frequently, to the stations of the first-order control so as to permit of a rigid adjustment therein. The tie points to the first-order triangulation are plainly indicated as such in the lists of geodetic positions and on the triangulation sketches to be found in appendix V.

Inside of the major scheme, and controlled by it, are the minor schemes of

triangulation and traverse used to locate the boundary monuments.

West of the summit of the Rocky Mountains the extremely tall and heavy growth of forests, the deep valleys, and the precipitous mountain ranges often made it extremely difficult to locate the monuments by triangulation. Consequently when the line was first reestablished and remonumented in 1903 to 1907 many of the monuments were omitted from the triangulation scheme. The distances between these monuments were determined at that time only by chaining or by stadia measurements of a comparatively low order of accuracy. Since that time the geographic positions of all these monuments have been determined by triangulation or by accurate traverse. This work has been done in conjunction with maintenance work under the treaty of 1925 and was completed in 1936.

The horizontal control of the Lake of the Woods region consists of an auxiliary scheme of first-order triangulation, tied to the first-order traverse at Warroad, Minnesota, extending over the southern part of Lake of the Woods; a minor scheme

of triangulation extending from this first-order scheme to Northwest Angle Inlet; and an invar tape traverse run along the meridian boundary from Northwest Angle Inlet to Buffalo Bay where it completes a circuit by a tie to the first-order triangulation.* The geographic positions of the monuments on the meridian line are determined by the invar tape traverse.

The methods used both in the field work and in the office computations of the horizontal control follow in general the standardized methods of the United States Coast and Geodetic Survey and the Geodetic Survey of Canada for work of comparable character.

MONUMENTS AND MONUMENTING

The International Boundary from the Gulf of Georgia (Georgia Strait) to the Northwesternmost Point of Lake of the Woods is marked by 959 monuments set on the boundary line, 2 reference monuments referencing the Northwesternmost Point of Lake of the Woods, and 4 range marks ranging the boundary across Boundary Bay between Monuments 4 and 5. The monuments have been interspaced so as to make the demarcation of the line as effective as possible. They are placed on heights of land, at crossings of prominent streams, at convenient intervals on the level plains, and at crossings of important international highways.

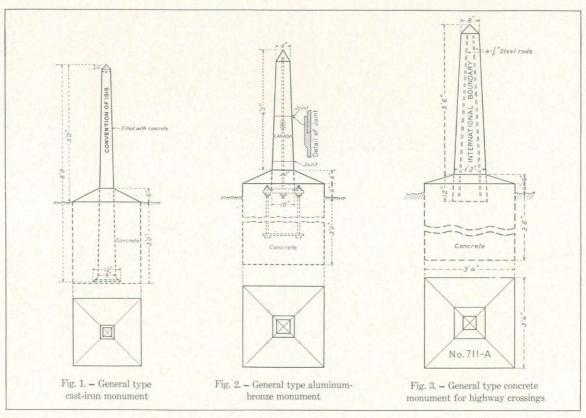
Wherever possible—and it is so in the majority of instances—the monuments are so placed as to be consecutively intervisible. Nine hundred and twenty-six of the boundary monuments bear the consecutive numbers from 0 to 925, Monument 0 being the initial monument on the eastern shore of Georgia Strait and Monument 925 being the most northern monument on the meridian boundary and the first one south of the Northwesternmost Point of Lake of the Woods. The other 33 boundary monuments established subsequent to 1907 are designated by letters combined with the number of the consecutively numbered monument just preceding, as for example, 116–A, 116–B.

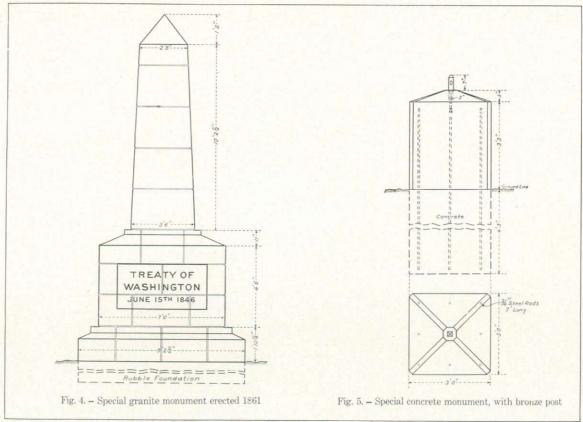
Types of Monuments

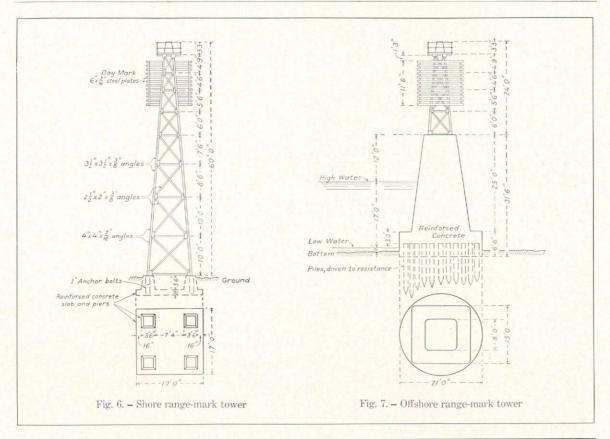
The monuments which mark and reference the boundary are of the following 11 types:

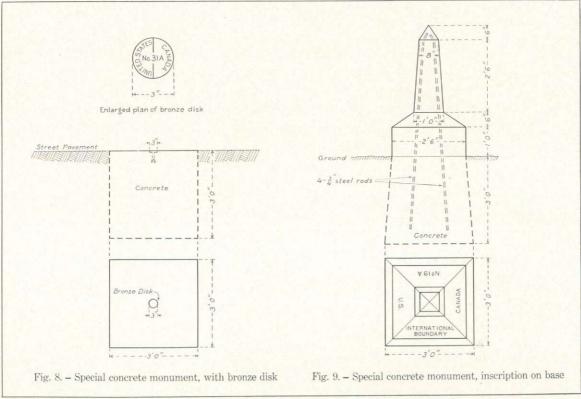
- 1. General type of cast-iron monument made in 1872–76 and in 1908–13. (Fig. 1.)
- 2. General type of aluminum-bronze monument made and set in 1904–9. (Fig. 2.)
- 3. General type of concrete monument for marking highway crossings. (Fig. 3.)
- 4. Special granite monument erected in 1861. (Fig. 4.)
- 5. Special concrete monument with bronze post. (Fig. 5.)
- 6. Shore range-mark tower. (Fig. 6.)
- 7. Offshore range-mark tower. (Fig. 7.)

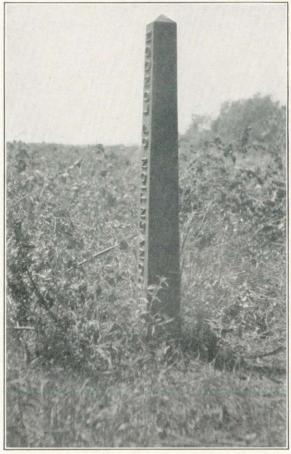
^{*}For complete data, horizontal control of the Lake of the Woods region, see the Commissioners' Joint Report upon the Survey and Demarcation of the Boundary between the United States and Canada from the Northwesternmost Point of Lake of the Woods to Lake Superior, 1931, appendix V, and accompanying triangulation sketches.











ORIGINAL MONUMENT 53, NOW REPLACED BY MONU-MENT 849, ONE OF THE CAST-IRON MONUMENTS SET IN THE RED RIVER VALLEY BY THE COMMISSION OF 1872-76. PHOTOGRAPHED IN 1912

- 8. Special concrete monument with bronze disk, for surface mark. (Fig. 8.)
- 9. Special concrete monument with inscriptions on base. (Fig. 9.)
- 10. Special conical bronze monument.
- 11. Special concrete monument, Lions Clubs. (Photograph on p. 125.)

The general type of cast-iron monument of 1872–76 and 1908–13, shown in figure 1, page 116, though of uniform exterior dimensions, differs somewhat in detail. Those of both dates are hollow iron castings in the form of a truncated pyramid 8 feet high, 8 inches square at the bottom, 4 inches square at the top, with a solid pyramidal cap, and a heavy flange at the bottom.

The monuments of 1872–76 have sharp, square corners; the thickness of the metal in the shaft is ¾ inch; the flange at the bottom is octagonal and is 1 inch thick; the average weight is 285 pounds. Upon opposite faces—the south and the north—are cast, in raised letters

2 inches high, the inscriptions "CONVENTION OF LONDON" and "OCTOBER 20, 1818", the inscriptions beginning about 4% feet above the bottom and reading upward.

These monuments had been set along the southern boundary of Manitoba by the Commission of 1872–76. Eighty-five of these, corresponding to the present numbering 748 to 832, were set west of Red River. About 60 were found to be in good condition in 1911. They were filled with concrete and reset in concrete bases with the top of the obelisk 5 feet above the ground. The broken ones and also those that had originally been set east of Red River were destroyed and replaced by new cast-iron monuments of the style made in 1908–13.

The monuments cast in 1908–13, while of the same external dimensions as those of 1872–76, have the corners slightly rounded; the thickness of the metal in the shaft is ½ inch; the flange at the bottom is 12 inches square and ¾ inch thick; the average weight is 380 pounds. The shaft bears the following inscriptions, cast in raised letters: On the north face "CANADA", on the south face "UNITED STATES", on the east face "CONVENTION OF 1818", on the west face "TREATY OF 1908." The inscriptions read vertically from bottom to top. The number of the monument is outlined with drill holes on the face of the shaft. The monuments set on the "meridian line" were turned so that "UNITED STATES" appears on the east side and "CANADA" on the west side.

These monuments were filled with concrete and set in concrete bases with the top of the shaft 5 feet above the ground. They were used in 1908–13 to mark the line from Monument 303 eastward to the Northwesternmost Point of Lake of the Woods except where the cast-iron monuments of 1872–76 were reset as heretofore described.

Two monuments like those just described, except for the inscriptions, were used to reference the terminus of the meridian line, the point adopted by the treaty of 1925 in lieu of the Northwesternmost Point of Lake of the Woods. These monuments bear the words "REFERENCE MARK" cast in large raised letters on the side of the shaft facing the point referenced. The other three faces of the shaft are blank.

The general type of aluminum-bronze monument set in 1904–9 is shown in figure 2, page 116. These monuments are hollow shafts of aluminum-bronze, of a composition of about 10 percent aluminum and 90 percent copper, set in a concrete base. They were made of sectional design to facilitate transportation to their sites in the rugged mountain country by pack horses and by back-packing by men.

Their design and dimensions are fully shown in the drawing.

The inscriptions on these monuments are of two different wordings. On those set west of the summit of the Rocky Mountains, consecutive numbers 2 to 272, the inscriptions are cast in small raised letters in horizontal lines across the middle section of the shaft and are as follows: On the north face "CANADA", on the south face "UNITED STATES", on the east face "TREATY OF 1846, LINE ESTAB-LISHED 1857-1861, SURVEYED AND MARKED 1903–1907." The west face is blank except for the number of the monument, which is in raised figures on a plate that is attached to the top section of the shaft by means of a grooved slot designed for that purpose. On those set east of the summit of the Rocky Mountains, consecutive numbers 273 to 302, the inscriptions are cast in large raised letters, in vertical lines reading upward, on the top section of the shaft and are as follows: On the north

¹ No. 44–A is an aluminum-bronze monument of the standard type. No. 45 is a special conical bronze monument.



TYPICAL CAST-IRON MONUMENT USED ON THE PRAIRIE SECTIONS OF THE BOUNDARY; BENCH-MARK POST IN THE

face "CANADA", on the south face "UNITED STATES", on the east face "TREATY OF 1908", on the west face "CONVENTION OF 1818." On the west face the number of the monument is outlined by drill holes.

The two types of monuments just described include the reference monuments and all of the consecutively numbered monuments from Monument 2 to Monument 925.

The general type of concrete monument for marking highway crossings is shown



EAST REFERENCE MONUMENT, AT THE NORTHWEST-ERNMOST POINT OF LAKE OF THE WOODS



TYPICAL ALUMINUM-BRONZE SECTIONAL MONUMENT USED ON THE MOUNTAIN SECTIONS OF THE BOUND-ARY. COMMISSIONER OGILVIE AS A YOUNG SURVEYOR IN 1908

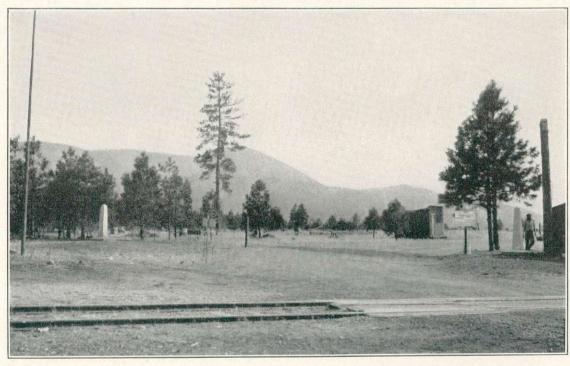
in figure 3, page 116. This design of monument, for marking the boundary crossings of important international highways during the course of maintenance work under the provisions of article IV of the treaty of 1925 on all parts of the boundary between the United States and Canada, was adopted by the Commissioners in 1928. Twenty-eight monuments of this type have been set in pairs, one on each side of the highway, at 14 road crossings on the 49th parallel boundary, numbered and located as follows:

Monuments 2-A and 2-B on the Ladner-Point Roberts highway; Monuments 3-A and 3-B on the Ladner-Boundary Bay highway; Monuments 5-A and 5-B, 5-C, and 5-D on the western crossings, and 5-E and 5-F on the eastern crossing of the Pacific Highway (Blaine-Vancouver); Monuments 116-A and 116-B at the crossing of the Wenatchee-Penticton highway; Monuments 165-A and 165-B at the crossing of the Kettle River Valley highway; Monuments 174-A and 174-B at the Northport-Rossland highway; Monuments 188-A and 188-B at the Spokane-Nelson highway; Monuments 216-A and 216-B on the Bonners Ferry-Cranbrook highway; Monuments 290-A and 290-B at the Browning-



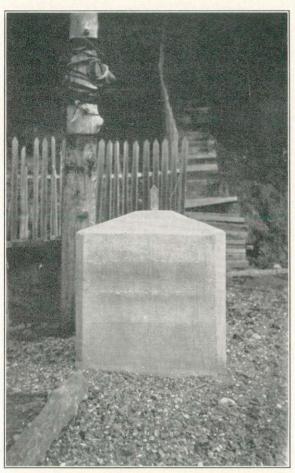
MONUMENT 711-B, SHOWING TYPE OF MONUMENT USED IN PAIRS TO MARK THE BOUNDARY AT IMPORTANT HIGHWAY CROSSINGS

Cardston highway; Monuments 388–A and 388–B at the Havre-Medicine Hat highway; Monuments 711–A and 711–B at the Canal-to-Canada Highway; and Monuments 833–A and 833–B at the Minneapolis-Winnipeg highway.



MONUMENTS 165-A AND 165-B SET ONE ON EACH SIDE OF THE HIGHWAY CROSSING THE BOUNDARY AT LAURIER, WASHINGTON

This type of monument is an ornamental concrete obelisk set in a plain concrete base. The surface of the obelisk or shaft is finished in light-colored granular quartz aggregate, washed free of cement so that the color and texture of the coarse granular aggregate shows clean. The shaft is 6 feet 6 inches in length and projects 5 to 5½ feet above the base. It is 14 inches square at the base and tapers to a cross-section of 8 inches square at the top, and is capped by a pyramid 4 inches in height. It is reinforced with four ½-inch steel rods extending throughout its length. The base of the monument is 3 feet 4 inches square. The top surface of the base slopes away



MONUMENT 0 (ZERO) AT HIGH-WATER MARK ON THE WEST SHORE OF POINT ROBERTS, GEORGIA STRAIT



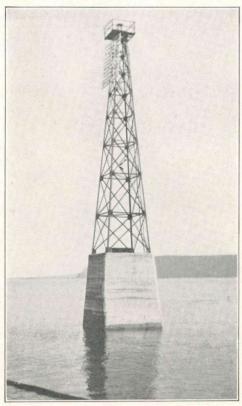
MONUMENT 1, THE GRANITE MONUMENT ERECTED ON POINT ROBERTS IN 1861

from the shaft uniformly on each side 4 inches to the foot. The base projects about 4 inches above the surrounding ground surface and extends down to a firm foundation not less than 3 feet 6 inches below the ground surface unless solid rock formation is encountered at a lesser depth. The base is constructed of 1:2:4 concrete which is poured in place at the time the monument is set.

The inscriptions on the shaft of the monument are cast in black aggregate flush with the surface. They read vertically upward and are as follows: On the side facing the highway "INTERNATIONAL BOUNDARY", on the side away from

the highway "TREATY OF 1925", on the north side "CANADA", on the south side "UNITED STATES." The number of the monument is engraved in the top surface of the base, with the exception of Monuments 388–A, 388–B, 833–A, and 833–B on which the number and the year of erection are cast in the shaft of the monument.

The special granite monument is shown in figure 4 on page 116. There is but one monument of this kind, Monument 1 on Point Roberts, on the eastern shore of Georgia Strait. It was erected in 1861 by the Commission of 1857–69 in the



OFFSHORE RANGE MARK ON THE WEST SIDE



SHORE RANGE MARK, EAST SIDE OF BOUND-ARY BAY, AND OBSERVING TOWER OVER MONUMENT 5

first survey of this section of the boundary. The monument is of cut granite. Its design and dimensions are shown in the drawing.

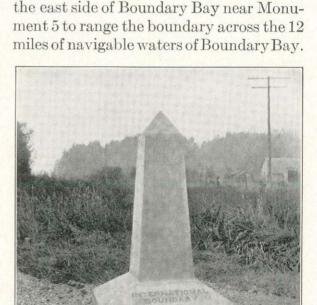
The inscriptions on the monument, cut in large letters in the granite, are as follows: on the north face—"CAPT. J. C. PREVOST. R. N., CAPT. C. H. RICHARDS. R. N., LT. COL. J. S. HAWKINS. R. E., H. B. Ms. COMMssrs"; on the east face—"LAT. 49° 0′ 0″, LONG. 123° 3′ 53″, ERECTED 1861"; on the south face—"ARCHIBALD CAMPBELL, U. S. COMMssr"; and on the west face—"TREATY OF WASHINGTON, June 15th 1846."

The special concrete monument with bronze post is shown in figure 5, page 116. There is but one monument of this kind, Monument 0 (zero) at the high-water mark on the west shore of Point Roberts. The monument is of reinforced monolithic concrete, constructed to withstand wave action and the battering of driftwood

brought in by the tide. It is in the form of a concrete pier 3 feet square and 7 feet 11 inches in height, set 4 feet 3 inches in the ground on hard glacial clay. In the center of the top of the pier is a 2-inch manganese-bronze post projecting 7 inches above the concrete. On the east face of this post is cast in raised letters the inscription "INT. BDRY.", on the north face "CANADA", on the south face "U. S.", and on the west face is inscribed "0" (zero), the designating number of the monument.

The towers used for range marks are shown in figures 6 and 7, page 117. These range marks are four in number. They are placed in pairs between Monuments 4

OFFSHORE RANGE MARK, EAST SIDE OF BOUNDARY
BAY. PHOTOGRAPH BY J. S. MYERS, U. S. CUSTOMS



and 5—one pair on the west side of Boundary Bay near Monument 4 and one pair on

TYPE OF MONUMENT USED FOR MONUMENT 19-A

These two pairs of range marks differ from each other only in minor details of construction. Each pair is made up of a shore mark and an offshore mark. Each shore mark consists of a 60-foot steel tower set on a suitable concrete foundation, carrying on its top a lantern table and on its offshore side near the top a slatted day-mark 11 feet square. Each offshore mark consists of a 24½-foot steel tower, identical in construction with the upper section of the shore tower, set on a concrete pier approximately 25 feet above mean low-water level. A bronze tablet attached to the offshore face of the pier marks the exact intersection of the boundary line with the pier. Suitable lights will be maintained on the towers by night.

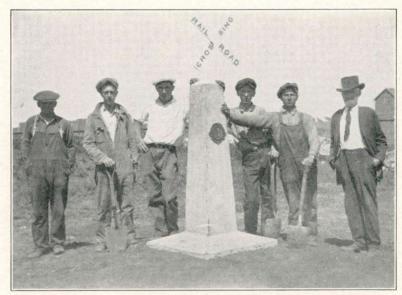
Similar range marks have been placed on the western shore of Point Roberts. They range the first course of the water boundary, 49th parallel to the Pacific Ocean.

The special concrete monument with bronze disk shown in figure 8, page 117, is designed for situations where a monument rising above the ground would be an obstruction to traffic. The monument is a concrete pier of such dimensions as to insure its permanence in its particular situation, set with its top surface flush with the ground, and bearing in the center of its top surface a 3-inch bronze disk engraved with a line to mark the boundary and, on the appropriate sides of the line, the words "UNITED STATES" and "CANADA." Two such monuments, Nos. 31–A and 31–B, mark the boundary crossing of the main street between the towns of Huntingdon, British Columbia, and Sumas, Washington.

The special concrete monument with inscription on base is shown in figure 9, page 117. There is but one of these monuments, Monument 19–A set in front of the

Canadian customhouse at the port of Aldergrove about 12 miles east of Blaine, Washington.

The special conical bronze monument, Monument 45, is a hollow conical casting of aluminumbronze about 30 inches in height, set in a concrete base. The number of the monument is inscribed in sunken letters on the west face of the concrete base. The monument is identical with some of those used on the 141st meridian boundary between Alaska



LIONS CLUBS MONUMENT, NO. 832-A, NEAR EMERSON, MANITOBA

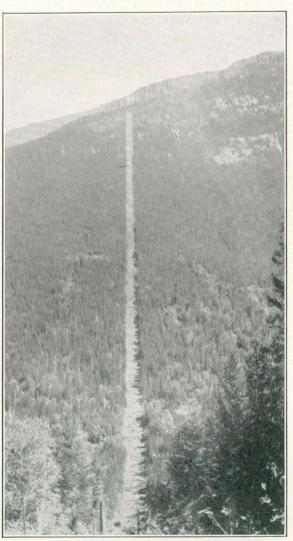
and Canada.² The monument was set to mark a point previously selected for a monument and printed as such on the maps, but where no monument had been placed. At the time the discrepancy was noted no monument of the standard type was available. Another monument, of the standard aluminum-bronze type, set about ½ mile farther west, originally bearing the number 45, was renumbered 44—A in 1936.

The special concrete monument of the Lions Clubs (see photo above) is Monument 832–A, set on the west side of the highway between Pembina, North Dakota, and Emerson, Manitoba. The monument was erected in 1926 by the International Lions Clubs of Winnipeg, Manitoba, and Grand Forks, North Dakota. The Commissioners approved the design of the monument, located its exact site on the boundary, and superintended its erection. In 1929 the highway was moved about

² See Report, International Boundary Commission, 141st Meridian from the Arctic Ocean to Mount St. Elias, 1918, pages 187–190.

500 feet farther west and the Commissioners moved the monument to the west side of the new location of the highway. The monument is an obelisk of reinforced concrete made with white cement. It is 14 inches square at the base, 8 inches square at the top, and 5 feet high, and is set in a concrete base 3 feet 4 inches square. On the east side of the monument, facing the highway, is a bronze plaque which bears the insignia of the International Lions Clubs. The other three faces of the monument bear no markings.

While the several types of monuments have been designed for permanency and the monuments have been set with due regard to the effect of the soil and the climatic conditions on their stability, numbers of them have been damaged or displaced, some by falling timber and forest fires, others, set in marshy ground, by being heaved out



THE BOUNDARY VISTA, LOOKING EAST TOWARD MONUMENT 249, EAST OF GATEWAY, MONTANA

of position by the action of frost, and still others by acts of vandalism. Those known to be damaged have been restored to their original condition. Future repair work will be necessary from time to time.

THE BOUNDARY VISTA

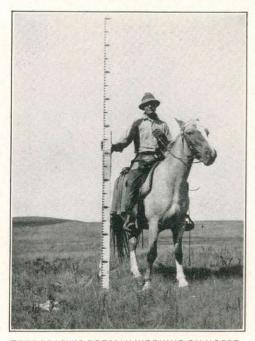
To supplement the boundary monuments, the line has been marked through all tree- and brush-grown areas by a cleared vista 10 feet on each side of the line. The importance of this adjunct to the monuments in the demarcation of the boundary has been recognized in practice by present and former Boundary Commissions for this and other sections of the boundary between the United States and Canada. It is the best means by which the boundary can be made easily recognizable through heavily timbered areas. The total length of boundary vista on this section of the line is 488 miles.

Brush and second-growth timber grow rapidly, and it is necessary from time to time to reopen the vista in order to preserve its value. On the west coast from Monument 1 to Monument 43, where the new growth is the most rapid, it has been necessary to reclear the vista several times since it was first cleared. The reclearing

was done in 1922, in 1928, and again in 1933 and 1934. Through the Turtle Mountains and the Pembina Mountains on the North Dakota-Manitoba boundary, the vista was recleared in 1932. On the Minnesota-Manitoba boundary from the Red River to the Northwesternmost Point of Lake of the Woods the vista was recleared in 1928. On the Rocky Mountain and the Cascade Mountain sections of the line about 200 miles of vista was recut in 1933 to 1936. Vista recutting must frequently be done as a part of maintenance under the provisions of the treaty of 1925.

TOPOGRAPHY

As there were no "accurate modern charts" of the territory traversed by this section of the boundary as required first by agreement between the two Governments, and later by articles VI and VII of the treaty of 1908, the Commissioners agreed to



TOPOGRAPHIC RODMAN WORKING ON HORSE-BACK ON THE PRAIRIE



TOPOGRAPHIC MAPPING WITH THE PLANE TABLE IN THE CASCADE MOUNTAINS

map an area adjacent to the boundary line on a scale and with a contour interval which would clearly show the topographic features of the country.

From Georgia Strait to the eastern base of the Rocky Mountains in longitude 113°30′ the terrain is for the most part rugged and heavily timbered. Along this section the mapping extended for a width of not less than 2 miles on each side of the boundary, with a contour interval of 100 feet.

From the eastern base of the Rocky Mountains across the Great Plains to the crossing of the Roseau River in longitude 96°30′, the width of the country mapped was reduced to not less than 1 mile on each side of the boundary, with a contour interval of 20 feet.

From the crossing of the Roseau River across the swamp areas to the west shore of Lake of the Woods, the width remained the same but the contour interval

was reduced to 10 feet. Buffalo Bay of Lake of the Woods, the "meridian line", and Northwest Angle Inlet were similarly mapped.

Horizontal control for the maps was furnished by triangulation and traverse (p. 114) and vertical control by lines of levels, stadia traverse along the boundary, and

vertical angles (see below).

The methods used by the United States surveyors differed somewhat from those used by the Canadians, but where areas overlapped for short distances the results were surprisingly similar. The United States parties used the plane table exclusively with a field scale of 1: 45,000, while under Canadian technique the topography of mountainous regions was developed by phototopography supplemented by traverses of about the same character as that used by the United States parties. On the sections of low relief the Canadian parties used a specially devised instrument for combined level lines and stadia traverse. This was accompanied by notebook sketches and hand-level readings. Notes and sketches were plotted and adjusted on field sheets kept in camp, thus affording opportunity for correcting errors and for filling in any overlooked areas.

VERTICAL CONTROL

The vertical control for the topographic maps includes elevations of bench marks that had previously been established by other agencies on or near the boundary, lines of levels run from previously established bench marks to convenient points on the boundary, and, where the character of the country made it practicable, lines of levels along the boundary from monument to monument.

At the time the surveys for the boundary maps were made and the boundary levels run, most of the bench marks available for initial elevations were in unadjusted circuits with elevations subject to corrections, to be later determined, to reduce them to true mean-sea-level datum. Since that time, the United States Coast and Geodetic Survey and the Geodetic Survey of Canada have each run many miles of first-order levels paralleling, and in places crossing, the boundary, often connected at common bench marks. Each of these organizations has completed the adjustment of its first-order net of levels, and elevations of bench marks of each organization are now known on slightly differing mean-sea-level datums. The bench marks of the boundary survey and the bench marks upon which they were based have been tied to these first-order bench marks in many places, making it possible to adjust the elevations used in the boundary mapping to mean-sea-level datum as determined by the Geodetic Survey of Canada.

The elevations published in this report (appendix IV, p. 218) have been adjusted, except for an instance or two noted, to agree with the elevations of the Geodetic Survey of Canada as published in 1929 and 1930.³

The elevations on the boundary maps were determined, as has been noted, and the maps were printed several years before data for the final adjustment of the elevations were available. Therefore, the elevations shown on the maps differ slightly from those published in appendix IV of this report.

³ Precise Levelling in Manitoba (Publication No. 21), Precise Levelling in Saskatchewan (Publication No. 22), Precise Levelling in Alberta (Publication No. 23), and Precise Levelling in British Columbia (Publication No. 24), Geodetic Survey of Canada, 1929 and 1930.

For the vertical control of the maps of the section of boundary from Georgia Strait to the eastern base of the Rocky Mountains, a system of level lines in combination with vertical angles and stadia surveys was used, described as follows:

On Point Roberts, where no bench marks were available, sea level from local observations was used as the datum for the mapping. No bench marks were established in this locality.

Across the coastal plain from Boundary Bay to the base of the Cascade Mountains, bench marks of the United States Geological Survey, established in 1905 along and near the boundary from Blaine, Washington, to Sumas, Washington, were used for the control of stadia surveys of the topography. Since the mapping was done, the United States Coast and Geodetic Survey and the Geodetic Survey of Canada have both run first-order level lines to Blaine, connecting with each other and with the United States Geological Survey bench marks. The Geodetic Survey of Canada has established first-order bench marks on the boundary at Sumas-Huntingdon.

At the boundary crossing of the Pasayten River a bench mark was established by running a checked line of levels from a United States Geological Survey bench mark at Barron,⁴ Washington, through Windy Pass and down the Pasayten River to the boundary. From Sumas, Washington, through the high mountain region to the crossing of the Pasayten River, elevations were determined by vertical angles and stadia traverse based on the elevations of the bench marks at Sumas and at the Pasayten River.

From the Pasayten River eastward, elevations were likewise determined by vertical angles and stadia traverse to the Similkameen River, where connections were again made with United States Geological Survey bench marks.

From the Similkameen River eastward to the eastern crossing of the Kettle River at Laurier, Washington, sufficient vertical control was provided by United States Geological Survey bench marks which since have been tied to first-order level lines of the United States Coast and Geodetic Survey and of the Geodetic Survey of Canada.

From the eastern crossing of Kettle River at Laurier to the Columbia River crossing, elevations were obtained by vertical angles and stadia surveys based on bench marks at both places.

The bench mark at the boundary crossing of the Columbia River was established by a double-run line of levels, 43 miles in length, from a United States Geological Survey bench mark at Meyers Falls, Washington. This line has since been tied to the first-order lines of both the United States and of Canada.

From the boundary crossing of the Columbia River eastward to the western crossing of the Kootenai River at Porthill, Idaho, elevations depend entirely on vertical angles and stadia surveys. However, since the boundary maps were made, a highway from Spokane, Washington, to Nelson, British Columbia, crossing the boundary about 2½ miles east of Clark Fork (Pend-d'Oreille), has been built and a bench mark established at the boundary crossing by the United States Geological Survey. The Geodetic Survey of Canada has checked the elevation of this bench mark.

⁴ Barron a mining camp near Slate Creek, no longer exists.

At the west crossing of the Kootenai River at Porthill, Idaho, a bench mark was established by running a double line of levels from a Great Northern Railway elevation at Bonners Ferry, Idaho, through Porthill to a Canadian Pacific Railway elevation at Creston, British Columbia. Since the boundary maps were made, the Geodetic Survey of Canada has tied to the Porthill bench mark from the north with a first-order level line, and the United States Coast and Geodetic Survey has tied to it with a first-order level line from the south.

From the west crossing of the Kootenai at Porthill to the east crossing of the Kootenai at Gateway, Montana, the elevations on the boundary maps depend on

vertical angles and stadia surveys.

At Gateway, bench marks were established by a double-run line of levels from Rexford, Montana, based on a Great Northern Railway elevation. This line has since been rerun by the United States Coast and Geodetic Survey as a part of their first-order levels.

From the east crossing of the Kootenai at Gateway to the North Fork of the Flathead River, the elevations on the boundary maps depend on vertical angles and stadia surveys.

Bench marks were established on the Flathead River by a double-run line of levels from a United States Geological Survey bench mark near Apgar, in the vicinity of Belton, Montana, on the Great Northern Railway datum. This line has since been reduced to first-order datum by a connection with first-order levels of the United States Coast and Geodetic Survey at Belton.

Across the summit of the Rocky Mountains to the valley of the St. Mary River at their eastern base, vertical angles and stadia surveys were the means of

determining elevations for the topographic mapping.

In the St. Mary River valley near the boundary, the United States Geological Survey and the United States Reclamation Service had established a number of bench marks from lines of levels run in circuits from the Great Northern Railway in the vicinity of Fort Browning and Cutbank, Montana. These circuits have recently been reduced to first-order datum through connections with the first-order levels of the United States Coast and Geodetic Survey at Fort Browning and at Cutbank.

This combination of levels, stadia surveys, and vertical angles sufficed for mapping, on a 100-foot contour interval, the rugged country from Georgia Strait to the eastern base of the Rocky Mountains. At this point the abrupt change in the character of the country demanded that a much smaller contour interval be used eastward to accurately portray the topography. This required much more accurate vertical control and necessitated the running of almost continuous lines of levels along the boundary.

From the United States Geological Survey bench marks in the valley of the St. Mary River, a single line of wye levels was run continuously along the boundary eastward for 62 miles to a connection with United States Geological Survey and United States Reclamation Service bench marks near the crossing of the Great Northern Railway at Coutts-Sweetgrass. Permanent bench marks were established all along the boundary, either in the bases of or near the boundary monuments. This

line has now been adjusted to close on a Geodetic Survey of Canada first-order bench mark at Coutts.

From Coutts, Alberta, eastward for 207 miles to Monument 478, about 4 miles west of Frenchman Creek, wye levels were run along the boundary and the elevation of each monument determined, but no permanent bench marks were set.

Later, the United States Geological Survey established about 25 bench marks along this section of the boundary and many of these were used to check the boundary levels. The descriptions and elevations of these United States Geological Survey bench marks are included in appendix IV.

The elevation of Monument 486 was determined by a line of levels about 36 miles in length run from a United States Geological Survey bench mark designated "Rock Creek triangulation station", about 12 miles north of Hinsdale, Montana. The elevation of the bench mark in Monument 486 has since been determined by first-order levels by both the United States Coast and Geodetic Survey and the Geodetic Survey of Canada.

From Monument 486 westward to Monument 478 a double line of levels was run and a permanent bench mark established at each monument.

The elevation of Monument 538 was determined by running a line of levels approximately 40 miles in length from a United States Geological Survey bench mark near Custer's ranch, about 20 miles south of Scobey, Montana. The line was continued westward along the boundary and closed on Monument 486. A permanent bench mark was established at each boundary monument.

The elevation of Monument 615 was determined by a line of levels approximately 52 miles in length run from a United States Geological Survey bench mark at Ray, North Dakota. Levels were then run westward along the boundary from Monument 615 to a closure on the bench mark at Monument 538. A permanent bench mark was established at each monument. The elevation of the bench mark at Ray has since been determined by first-order levels of the United States Coast and Geodetic Survey.

From Monument 615 eastward, a line of levels was run to Monument 630 at Portal, North Dakota, a distance of 22 miles. A permanent bench mark was established at each monument. Since the time the boundary levels were run, the elevation of the bench mark in Monument 630 has been redetermined by first-order levels of both the United States Coast and Geodetic Survey and the Geodetic Survey of Canada, and this first-order elevation has been used in adjusting the boundary levels to the westward as far as Monument 486, where the elevation was determined by first-order levels in like manner.

From Monument 630 to Monument 693, the elevation of each monument was determined by a line of levels along the boundary, but no permanent bench marks were established.

From Monument 693 to Monument 721, across the Turtle Mountains, the boundary maps were made in 1910 and 1911. On account of the rough character of the terrain, the level lines run in connection with the mapping were not run along the boundary itself but along roads paralleling the boundary and at some distance

from it; and no permanent bench marks were established. In 1911 the Geodetic Survey of Canada established a first-order bench mark in the base of Monument 693, and in 1917 established a bench mark of the same order in the base of Monument 721. In 1918 the Boundary Commission, in connection with checking some triangulation, ran a line of levels along the boundary between the two monuments and determined the elevation of a point on the base of each intervening monument.

From Monument 721 to Monument 832, levels were run continuously along the boundary and the elevation of the ground at each monument was determined. No permanent bench marks were established. Since the time these levels were run, the Geodetic Survey of Canada has established several first-order bench marks on or near this section of the boundary.

From Monument 833 at Red River to Monument 911 at Lake of the Woods, a distance of approximately 90 miles, a continuous line of levels was run along the boundary and a permanent bench mark was established in the base of each monu-This section of the boundary crosses a comparatively flat terrain including many miles of the Great Roseau Swamp where accurate leveling is extremely difficult. The leveling instrument used on this work was a specially designed Bausch and Lomb dumpy level equipped with a micrometer screw under one end of the telescope to keep the level bubble centered, and with a mirror by which the observer watches the level bubble while reading the rod. The levels were run in short circuits, and made to close within a limit of 0.05 foot multiplied by the square root of the length of the circuit in miles. The boundary levels within this section were run in 1912. They were started from the Geodetic Survey of Canada first-order bench mark 3-C in the foundation wall of the post office at Emerson, Manitoba, and were closed on a United States Geological Survey bench mark in Warroad, Minnesota, about 7 miles south of the boundary. The following year, 1913, the Geodetic Survey of Canada ran a first-order level line from Emerson, Manitoba, along the Canadian Northern (now Canadian National) Railway through Warroad to Rainy River, Ontario, and established bench marks along the line. They determined the elevation of Monument 909 and of the United States Geological Survey bench mark in Warroad. The boundary levels have been adjusted to agree with the adjusted values of the elevations of these first-order bench marks.

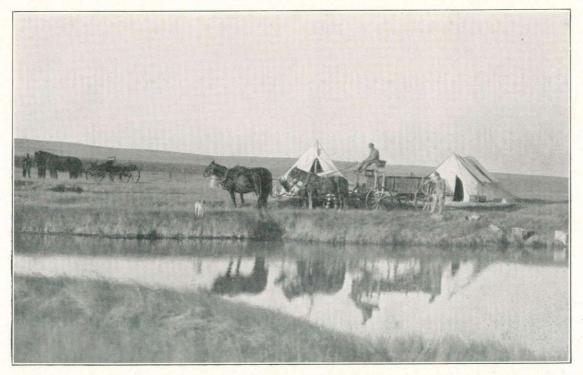
In 1929 and 1930 the Topographical Survey of Canada, in the course of special topographic work, redetermined the elevations of Monuments 853 to 903, inclusive, through a system of levels based on the Geodetic Survey of Canada first-order bench marks between Emerson and Sprague. With the exception of certain instances where the monuments have been disturbed either by settling or by heaving, due to the action of frost in the swampy districts, these redetermined elevations are in good agreement with those originally determined by the boundary levels. For the reason that a number of the monuments had been disturbed since the boundary levels were run, the elevations determined by the Topographical Survey of Canada for Monuments 853 to 903 have been adopted and published in the list of "Elevations along the 49th Parallel Boundary", appendix IV, page 240.

The vertical control for the meridian line, Monument 913 to Monument 925, was included in the vertical control for the entire boundary survey of Lake of the

Woods. For this survey, staff gages were established at Warroad, Minnesota, Oak Island, Oak Point (near the mouth of Rainy River), and in Northwest Angle Inlet. The elevation of the zero of the gage at Warroad was determined in May 1912 by connecting it by means of a double line of levels with the United States Army Engineers' bench mark at Warroad, the elevation of which had been determined by the United States Geological Survey. Readings of the elevation of the water surface were made on this gage three times each day from June 1 to October 31, 1912, and from April 28 to October 31, 1913. A similar series of readings was made on the Oak Island gage from June 8 to October 31, 1912, and from May 4 to October 27, 1913, and on other gages for shorter periods. From these readings an accurate determination of the Oak Island, Oak Point, and Northwest Angle Inlet gages was made by comparison with the readings of the Warroad gage. The elevations along the meridian line were determined from the Northwest Angle Inlet gage. These elevations have now been converted to the datum of the Geodetic Survey of Canada first-order levels through their determination of the elevation of the United States Army Engineers' bench mark at Warroad.

FIELD TRANSPORTATION

At the time the resurvey of this section of the boundary was begun, in 1901, the era of good roads was still in the future; the automobile and the motor truck had scarcely passed the experimental stage. Along much of the boundary there were no roads whatever; and where roads existed they were unsurfaced and rough at their best and all but impassable at their worst. The transportation of men, supplies,



TEAMS AND WAGONS WERE USED FOR TRANSPORTATION ON THE PRAIRIE

and material for the boundary survey work was a slow and arduous task which had to be carried on with the primitive equipment of pioneer days of horse-drawn wagon, the pack train, and at times by back-packing by the men themselves.

The 400 miles of boundary west of the summit of the Rocky Mountains was at that time directly accessible by railways or wagon roads at the following places only: On the west coast from Blaine, Washington, to the west base of the Cascade Mountains; from the Similkameen River to the east crossing of the Kettle River; the Columbia River Valley; the valley of the Kootenai at Porthill, Idaho; the valley of the Kootenai at Gateway, Montana; and the valley of the North Fork of the Flathead River. Between these places transportation was furnished by pack train over trails opened up or built by the survey parties. In many instances material for the monuments marking the boundary, including sand, cement, and water had to be delivered on the backs of men.

During the 5 years from 1903 to 1908 approximately 400 miles of pack trails were opened up and maintained and at the peak of the work more than 100 head of pack horses were in use.

In the years since 1908, the extension of railroads and modern highways, on both sides of the boundary, and the development of United States Forest Service roads and trails have made the boundary west of the summit of the Rocky Mountains more easily accessible, but there are still long stretches where trails have to be opened and pack trains have to be used for maintenance work.

East of the summit of the Rocky Mountains the country was adequately served by railroads both north and south of the boundary and by a number of lines crossing it. The general open prairie character of the country made transport from railroad points to and along the boundary much easier than to the westward.

THE OFFICIAL MAPS

Article VII of the treaty of 1908 with regard to the boundary from the Gulf of Georgia (Georgia Strait) to the summit of the Rocky Mountains stipulates that "the entire course of said boundary, showing the location of the boundary monuments and marks established along the course of the boundary, shall be marked upon quadruplicate sets of accurate modern charts prepared or adopted for that purpose, and the said Commissioners, or their successors, are hereby authorized and required to so mark the line and designate the monuments on such charts, two duplicate originals of which shall be filed with each Government * * *."

Similarly, with regard to the boundary from the summit of the Rocky Mountains to the Northwesternmost Point of Lake of the Woods, article VI of the treaty provides that "the said Commissioners shall mark upon quadruplicate sets of accurate modern charts prepared or adopted by them for that purpose the entire course of said boundary and the location of the boundary monuments and marks established along the course of said boundary, and two duplicate originals thereof shall be filed with each Government * * *."

The charts upon which the Commissioners have marked the boundary line from Georgia Strait to the Northwesternmost Point of Lake of the Woods, in accordance with these provisions of the treaty of 1908, are topographic maps prepared from surveys made by the field force of the Commission. The word "map" when used herein is synonymous with the word "chart" of the treaties. They consist of a series of 59 sheets, arranged and numbered as shown on an accompanying index map, together with a profile sheet. They were engraved on copper plates and printed from lithographic stones as were other similar boundary maps. The engraved plates will be preserved by the two Governments as permanent records of the work. The four official sets of maps, two for each Government, which bear the Commissioners' signatures, are transmitted in atlas form with this report.

The size of each map is 11 by 24½ inches inside the border. The conventional signs used to represent the topographic features are those used by the United States Geological Survey (which engraved sheets 1 to 19, inclusive), and are the same as those adopted by the United States Federal Board of Surveys and Maps. The boundary line, monuments, culture, and lettering appear in black; relief (contour lines and elevations) in brown; drainage, in blue; and timber, in green. The maps are constructed on polyconic projections on a scale of 1: 62,500, each covering 30 minutes of longitude. At the top of each map are the title, the number of the sheet, copies of the seals of the two countries, and the names of the Commissioners under whom the surveys were made. In the lower right corner is the Commissioners' certificate, which reads as follows:

Sheet 1, typical of sheets 1 to 19:

We certify that this chart is one of the quadruplicate set of fifty-nine (59) charts adopted by us under Articles VI and VII of the Treaty between Great Britain and the United States, signed at Washington April 11, 1908, and that we have marked thereon the Boundary Line as re-established by us in accordance with the provisions of the said Articles.

(Signed) O. H. TITTMANN
United States Commissioner

(Signed) W. F. King His Britannic Majesty's Commissioner

Sheet 20, typical of sheets 20 to 58:

We certify that this chart is one of the quadruplicate set of fifty-nine (59) charts adopted under Articles VI and VII of the Treaty between Great Britain and the United States, signed at Washington April 11, 1908, and that we have marked thereon the Boundary Line as reestablished by the Commissioners designated above, in accordance with the provisions of the said Articles.

Signed, November 17, 1921

(Signed) E. Lester Jones
United States Commissioner

(Signed) J. J. McArthur His Britannic Majesty's Commissioner

Sheet 59:

We certify that this chart is one of the quadruplicate set of fifty-nine (59) charts adopted under Articles VI and VII of the Treaty between Great Britain and the United States, signed at Washington April 11, 1908, and that we have marked hereon the Boundary Line as reestablished by the Commissioners designated above, in accordance with the provisions of Article VI of the Treaty of 1908 and of Article I of the Treaty between the United States and His Britannic Majesty, in respect of the Dominion of Canada, signed at Washington, February 24, 1925.

Signed December 7, 1927

(Signed) E. Lester Jones
United States Commissioner

(Signed) J. D. Craig His Britannic Majesty's Commissioner It will be noted that the last chart or map was signed on December 7, 1927. The terms of the treaty of 1908 in respect to monumenting and mapping had then been fully carried out. Subsequent to this date several additional monuments and marks have been placed on the boundary under authority of the treaty of 1925. These additional monuments and marks have all been reported on and shown on charts in the annual joint reports of the Commissioners to their Governments as required by the treaty of 1925. Under the circumstances the Commissioners deemed it to be inexpedient and unnecessary to bring the revision of the maps, regarding monuments, roads, and buildings, up to the date of certification of this report, but have included in the report the descriptions of the monuments and marks as valuable information supplemental to the requirements of the treaty of 1908.

A limited edition of copies of the official maps has been printed for each Government for distribution to governmental agencies, to libraries, and to others interested in the location of the boundary line. These copies are identical reproductions of the maps of the official sets and differ from them only in the following respects: They are printed on chart paper instead of the heavy bond paper on which the official sets are printed; they bear the date of publication, which the official sets do not; the Commissioners' signatures are in facsimile; and they are designated as copies. On sheets 1 to 19 the Commissioners' certificate differs slightly from that on the official sets; it reads: "We certify that this chart is a copy of sheet No. — of the quadruplicate set of fifty-nine (59) charts adopted by us under Articles VI and VII of the Treaty between Great Britain and the United States, signed at Washington April 11, 1908, on which we marked the Boundary Line as reestablished by us in accordance with the provisions of the said Articles." On sheets 20 to 59 the certificate of the Commissioners is the same as on the official sets, but the word "COPY" has been printed above the title. The date of signature on these copies occurs only on sheets 42 to 59.

In the United States, copies of the report and maps are on file in the Library of Congress and in other libraries designated by the Government as depository libraries—that is, those which receive all United States Government publications. In Canada they are on file in the Dominion Archives, in the libraries of the Dominion Parliament and of the provincial legislative assemblies, and in university and reference libraries throughout the country.

ESTABLISHMENT OF THE POINT ADOPTED IN LIEU OF THE ORIGINAL NORTHWESTERNMOST POINT OF LAKE OF THE WOODS IN ACCORDANCE WITH THE PROVISIONS OF THE TREATY OF 1925

In 1824 David Thompson, surveyor and astronomer for the British Government, received instructions from the Commissioners under article VII of the Treaty of Ghent to determine the "most northwestern point" of Lake of the Woods originally named in the treaty of peace, 1783, as the point to which the International Boundary was to run westward through the waterways from Lake Superior. Accordingly, in the course of his surveys of the western and northern portions of Lake of the Woods in 1824, Thompson selected, monumented, and determined the astronomical positions of three points which, in his opinion, came nearest to meeting the requirements of the treaty—a point in Northwest Angle Inlet; a second point in Monument Bay, east and a little north of Northwest Angle Inlet; and a third in Portage Bay still farther north. Another point which was later to be given consideration as the probable site of the Northwesternmost Point was at Rat Portage (Kenora), where an extensive series of astronomical observations had been made by Thompson during the previous year.

As a result of Thompson's work it was apparently realized that it would be necessary, in finally selecting the "most northwestern point", to choose between Rat Portage and the locality of the first point marked by Thompson in 1824, near the head of Northwest Angle Inlet. Accordingly, in the following year, 1825, Dr. J. L. Tiarks, astronomer for the British Government, inspected these two localities and decided that a point nearly a mile north of Thompson's monument in Northwest Angle Inlet was the true "most northwestern point" of Lake of the Woods. Tiarks' astronomic determination of the position of this point placed it in latitude 49°23′55″, longitude 95°14′38″.¹

Accordingly, in 1842 this point was accepted by the two Governments, and until the treaty of 1925 it figured in boundary history as the western terminus of the section of the line from Lake Superior to Lake of the Woods and the initial point of the section of the line running south therefrom to the 49th parallel and thence westward to the Rocky Mountains.

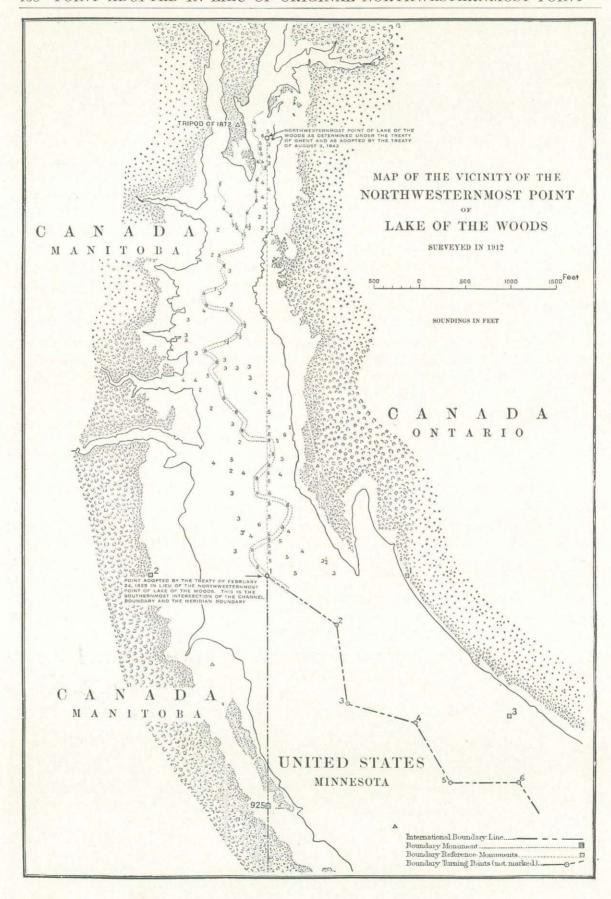
It was indicated, however, on a map made by the Boundary Commission of 1872–1876,² and the fact was definitely established by the surveys made in 1912³

¹ Art. II, treaty of 1842, p. 189 of appendix II. Also Journal of the Commissioners under the Treaty of Ghent, U. S. House of Representatives Document No. 451, 25th Cong., 2d sess., p. 48.

On the North American datum of 1927 the coordinates of the Northwesternmost Point are latitude 49° 23′51′′.35, longitude 95°09′11′′.36.

² See map published in Report upon the Survey of the Boundary between the Territory of the United States and the Possessions of Great Britain from the Lake of the Woods to the Summit of the Rocky Mountains, by Archibald Campbell, United States Commissioner, p. 83.

³ See map, p. 138.



under the treaty of 1908 that the straight course of boundary running due south from the Northwesternmost Point was intersected at five points by the winding course of boundary which follows the deep-water channel of Northwest Angle Inlet, thereby leaving two small areas of United States waters entirely surrounded by Canadian waters, a territorial delimitation neither intended nor desired by either Government.4

The Commissioners acting under the treaty of 1908 therefore agreed that the southernmost point of intersection of these lines, as determined in 1912, should be permanently fixed and monumented and were prepared to recommend to the two Governments, as they later did, that this point be adopted in lieu of the original Northwesternmost Point specified in articles V and VI of the treaty of 1908, so as to eliminate from the general line of demarcation between the two countries the intersecting portions of the boundary north of this point.⁵

The Commissioners' recommendations that this point be adopted in lieu of the Northwesternmost Point were acceptable to the two Governments, and in 1925 the point was formally adopted by article I of the treaty of that year, which in part reads as follows:

The Contracting Parties, in order to provide for a more practical definition of the boundary between the United States and the Dominion of Canada in Lake of the Woods, hereby agree that this most southerly point of intersection, being in latitude 49°23′04′′.49 north, and longitude 95°09′11′′.61 west, shall be the terminus of the boundary line heretofore referred to as the international boundary line between the United States and the Dominion of Canada from the mouth of Pigeon River, at the western shore of Lake Superior, to the northwesternmost point of Lake of the Woods and the initial point of the boundary line heretofore referred to as the international boundary between the United States and the Dominion of Canada from the northwesternmost point of Lake of the Woods to the summit of the Rocky Mountains, in lieu of the said northwesternmost point.

Article I of the treaty of 1925 further provides that "The aforesaid most southerly point shall be located and monumented by the Commissioners appointed under the said Treaty of April 11, 1908, and shall be marked by them on the chart or charts prepared in accordance with the provisions of Articles V and VI of the said Treaty, and a detailed account of the work done by the Commissioners in locating said point, together with a description of the character and location of the several monuments erected, shall be included in the report or reports prepared pursuant to the said Articles."

⁴ In 1902 the question of jurisdiction was raised by the General Land Office of the United States with respect to the areas enclosed between the meridian boundary and the channel boundary, and an opinion regarding this question was requested of the Department of State. The solicitor of that department, in a letter from the Secretary of State to the Secretary of the Interior dated June 25, 1904, advised against disposing of any lands in these areas and made the following reference to the boundary line in this vicinity:

[&]quot;It has been suggested that since it was the intendment of the treaty [of 1842] to settle finally the continuous boundary line between the two countries, all that portion of the line described in the treaty which lies north of the first intersection of the meandering and the meridional lines should be rejected. This would leave a single continuous boundary line running along the line described from Rainy Lake to its first point of intersection with the meridian line, thence south along the meridian line to the 49th parallel, thence west to the Rocky Mountains.'

⁵ This peculiar situation was given some consideration by the Commissioners of the survey of the boundary from Lake of the Woods to the Rocky Mountains, made in 1872 to 1876, as is shown by the report of the British Commissioner on file in the archives of the Canadian Government at Ottawa, but no formal action was taken.

In setting forth herein, as prescribed by the foregoing paragraph of the treaty, the detailed account of the work done by the Commissioners in locating said point, etc., it should be stated at the onset that practically all of the work of determining, locating, and monumenting the point specified by the treaty in lieu of the North-westernmost Point was actually done several years prior to the adoption of the point by the two Governments in 1925.

Late in the fall of 1912 a United States party under Mr. E. C. Barnard, surveyor in charge, made a detailed geodetic, topographic, and hydrographic survey of the northern part of Northwest Angle Inlet for the purpose of determining the position of the Northwesternmost Point and the course of the channel boundary southward therefrom. Although the surveyors of the Boundary Commission of 1872–1876 had redetermined the position of the Northwesternmost Point and had monumented the meridian line southward therefrom with durable cast-iron monuments, they had not monumented the point itself. It was necessary, therefore, in connection with the survey of 1912, that the point again be redetermined, and as the party could find no trace of the reference monument erected by David Thompson in 1824, the work of recovering the Northwesternmost Point had to be done entirely from the records of the survey of 1872, that is, by projecting the meridian line northward from Monument 925 and laying off thereon the recorded distance from Monument 925 to the Northwesternmost Point.

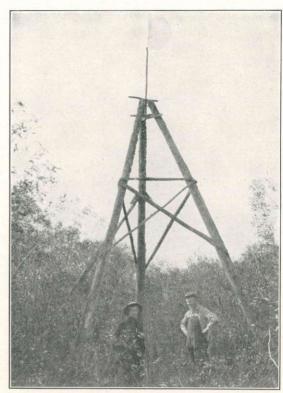
Accordingly, an 833-meter base line was measured with invar tape along the western shore of the inlet in the vicinity of the meridian line, and from this base a small scheme of triangulation was expanded up the inlet to include the site of the Northwesternmost Point and also southward to a junction with the general scheme of triangulation of Lake of the Woods which had been begun in Northwest Angle Inlet earlier that year by a Canadian party. Monument 925 of the meridian boundary was included in the triangulation, and the azimuth of that line was checked by an astronomic azimuth which was observed at station "New Rice." The meridian line was then projected north from Monument 925, and on this projected line a signal was erected near the probable site of the Northwesternmost Point and tied to the scheme of triangulation. The position and distance of this point relative to Monument 925 were then computed, and the precise location of the Northwesternmost Point was determined therefrom by laying off from this arbitrarily chosen point such distance on the meridian line as would make the distance from Monument 925 to the Northwesternmost Point precisely 7,307 feet, which was the distance determined originally by the surveyors of the Boundary Commission of 1872-1876.7

⁶ The surveyors of 1872 recovered the position of the Northwesternmost Point from the reference monument erected by David Thompson in 1824. This monument is described by Thompson as consisting of "a square monument of logs of 12 feet high by 7 feet width, the lower part of oak, the upper part of aspen." One charred log of this monument was recovered by the surveyors in 1872; the rest of the monument had evidently been destroyed by forest fires or carried away by high water. (Report upon the Survey of the Boundary between the Territory of the United States and the Possessions of Great Britain from the Lake of the Woods to the Summit of the Rocky Mountains, by Archibald Campbell, United States Commissioner, pp. 305 and 307.)

⁷ Report upon the Survey of the Boundary between the Territory of the United States and the Possessions of Great Britain from the Lake of the Woods to the Summit of the Rocky Mountains, by Archibald Campbell, United States Commissioner, p. 35. Also U. S. Senate Executive Document No. 41, 44th Cong., 2d sess., p. 44.

The point as thus established was accepted as being on the site of the original Northwesternmost Point. Its geographic position computed through the triangulation done in 1912 was latitude 49°23′51″.70, longitude 95°09′11″.63. On the North American datum of 1927, the datum on which all the boundary triangulation, turning points, and monuments are based. the position of the point is latitude 49°23′51″.35, longitude 95°09′11″.36.

On a narrow tongue of land a few hundred feet west of the Northwesternmost Point the party found an old nativetimber tripod which was a station mark left by the surveyors of the Boundary Commission of 1872–1876.8 This tripod was tied in to the general scheme of triangulation, and its position relative to the Northwesternmost Point, as shown on the map on page 138, was found to check closely with that recorded in the manuscript copy of the report of the British Commissioner



OLD TRIPOD AT HEAD OF NORTHWEST ANGLE INLET ERECTED BY BOUNDARY SURVEY OF 1872-76. PHO-TOGRAPH TAKEN IN 1912

of the survey of 1872-1876, quoted in the footnote on this page. A photograph of the tripod as it appeared in 1912 will be found on this page.

As soon as the triangulation was completed and the location of the Northwesternmost Point determined, a detailed topographic and hydrographic survey, controlled by the triangulation, was made to accurately determine the location of the shore line of the northern part of the inlet and the course of the deep-water channel. This survey was made with plane table and stadia on a field scale of 400 feet to the inch. The deep-water channel was carefully sounded throughout its width and length with a graduated rod, and the positions of the soundings were determined with telescopic alidade and stadia from plane-table stations on the shore and plotted directly on the plane-table sheet at the time the soundings were taken. A photolithographic reproduction of this plane-table sheet showing the course of the channel as thus run out appears in map form on page 138.

The survey showed that the boundary channel was a well-defined open-water channel of a uniform width of about 60 feet; that it was from 2 to 3 feet deeper than the water on either side of it; that within a distance of less than 1 mile south of the Northwesternmost Point its winding course intersected the meridian boundary at

⁸ A reference to this station, on p. 306 of the report of the United States Commissioner of the boundary survey of 1872-1876, shows that the tripod was erected by Capt. James F. Gregory, one of the engineers of the United States section of the Commission. The following reference, from a manuscript copy of the report of the British Commissioner of the same survey, further identifies the tripod as a station of the survey of 1872-1876 "A trigonometrical station 36 feet high was erected on the spit of land immediately to the west of the assumed N. W. Point, from which it bears North 59°09' West (true bearing) distant 377.3 feet."

five points; and that these intersecting lines of boundary, the meridian boundary and the line along the channel, enclosed between each intersection a small area of possibly indeterminate jurisdiction.

With the development of these facts, the southernmost of these points of intersection began to assume considerable importance. A signal was therefore erected at the point and its position was carefully determined by triangulation. Later in 1912 the Commissioners, after carefully studying the situation, decided that they would permanently monument this point and that they would recommend to the two Governments that it be adopted in lieu of the original Northwesternmost Point so as to eliminate from the boundary line the intersecting portions north of this point.

This monumenting was done early the following spring. While the lake and the adjacent swamps were still frozen two cast-iron reference monuments and the materials for their concrete bases were transported on sleds from the railroad at Warroad, Minn., to Northwest Angle Inlet and were erected on the shores of the inlet, on either side of the southernmost point of intersection which had been carefully located and marked the year before. The monuments had been specially cast for the purpose. They were 8-foot hollow cast-iron posts, 10 and when set they projected 5 feet above their concrete bases, which were $2\frac{1}{2}$ feet square, resting on a solid foundation below the frost line. Each monument bears the inscription "Reference Mark" cast in raised letters on one side of the iron post. Before being set, each monument was filled with concrete to increase its durability and its resistance to forest fires.

The two reference monuments are designated No. 1 and No. 2. They are set on a straight line which passes through the point which they reference. Reference Monument No. 1 is 1,526 feet east of this point, and Reference Monument No. 2 is 1,268 feet west.¹¹

The geographic positions of the reference monuments and the point which they reference were carefully determined by triangulation. The geographic positions of the reference monuments as thus determined were: Reference Monument No. 1, latitude 49°23′04′′.50, longitude 95°08′48′′.55; Reference Monument No. 2, latitude 49°23′04′′.48, longitude 95°09′30′′.77. The geographic position of the point which these monuments reference, as thus determined by triangulation, was latitude 49°23′04′′.49, longitude 95°09′11′′.61, which is the position of the point as later designated in the treaty of 1925. Expressed in terms of North American datum of 1927, the datum on which all points in this report are based, this position is latitude 49°23′04′′.14, longitude 95°09′11′′.34.¹¹ The point is 4,785 feet south of the original Northwesternmost Point and 2,522 feet north of Monument 925 of the meridian line. This point, adopted by the treaty of 1925 and established by the Commissioners, is the most northern point on the International Boundary between the United States and the Dominion of Canada.

⁹ The position of the point of southernmost intersection (boundary turning point No. 1), as determined by the Commissioners and as later adopted by the treaty of 1925, is shown on Sheet No. 1 of the official maps of the section of the International Boundary from the Northwesternmost Point of Lake of the Woods to Lake Superior, and on Sheet No. 59 of the official maps of the section of the International Boundary from the Gulf of Georgia to the Northwesternmost Point of Lake of the Woods.

¹⁰ See fig. 1, p. 116, and p. 118 for description.

¹¹ See Description and Definition of the Boundary Line, pp. 159 and 160.

DESCRIPTION AND DEFINITION OF THE INTERNATIONAL BOUNDARY LINE FROM THE GULF OF GEORGIA (GEORGIA STRAIT) TO THE NORTHWESTERNMOST POINT OF LAKE OF THE WOODS

The International Boundary Line between the United States and the Dominion of Canada from the Gulf of Georgia (Georgia Strait) to the Northwesternmost Point of Lake of the Woods as now reestablished is a series of straight-line courses which, taken together, closely approximate the astronomic parallel of forty-nine degrees of north latitude from the eastern shore of Georgia Strait to the turning point in Lake of the Woods, and a single straight-line course running due north from this turning point to the Northwesternmost Point of Lake of the Woods. It is primarily marked and defined by 926 boundary monuments, numbered consecutively from 0 to 925, and by 2 reference monuments at its terminus at the Northwesternmost Point of Lake of the Woods. The boundary is a straight line between each two consecutive monuments, between the turning point in Buffalo Bay of Lake of the Woods and the next of these monuments on either side thereof, and between the Northwesternmost Point of Lake of the Woods—as defined by the two reference monuments—and the first monument on line to the south.

In addition to these primary marks, the boundary has been marked under the provisions of the treaty of 1925 by 37 auxiliary marks—33 monuments designated by letters following the numbers, and 4 range marks. The 33 monuments have been placed on the straight-line courses between the primary monuments at places where the need for additional marks has developed. The four range marks have been erected to range the long straight-line course of the boundary across Boundary Bay between Monuments 4 and 5. Three of them mark points on this course of the boundary and the fourth is on the eastern prolongation of the course.

The total length of the line so reestablished and marked is 1,296.9 miles—1,270.2 miles along the parallel and 26.7 miles along the meridian or north-and-south line.

The description of the line, as reestablished by the Commissioners and as marked by them on the 59 boundary maps which accompany this report, is set forth in tabular form on pages 144 to 160, inclusive. The tables give the geographic positions of all the boundary monuments, the turning point, termini, and reference monuments, together with the lengths and azimuths of the connecting straight-line courses.

The lengths of the courses and other tabulated distances are given in meters, and the azimuths are reckoned clockwise from due south. All distances have been reduced to mean sea level. To obtain the actual horizontal distance between points of known elevation above sea level, the distances given in the tables should be increased by an amount equal to $0.0000000478\ L\ E$, in which L is the tabulated length of the course in meters and E is the mean elevation of the ends of the course

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The maximum value of this increase approaches 1 part in 2,300 on the in feet. highest elevations of this section of the boundary.

All latitudes and longitudes are given on the North American datum of 1927. This is the standard geodetic datum recently adopted by the United States Coast and Geodetic Survey for the United States and Alaska, and for the present in use by the Geodetic Survey of Canada for the extension of its triangulation northward in western Canada. It is the result of the readjustment of the network of arcs of first-order triangulation of the two countries, retaining the latitude and longitude of the station "Meades Ranch" of the former North American datum, but controlling the orientation of the new adjustment by many additional Laplace azimuths distributed throughout the network.¹ It supersedes the former North American datum.

GEOGRAPHIC POSITIONS OF MONUMENTS MARKING THE INTERNATIONAL BOUNDARY FROM THE GULF OF GEORGIA (GEORGIA STRAIT) TO THE NORTHWESTERNMOST POINT OF LAKE OF THE WOODS

Station	Latitude and longitude	Azimuth	To station	Distance (meters)	Station	Latitude and longitude	Azimuth	To station	Distance (meters)
Mon. 0 (zero) (Initial point).	9 00 08.03 123 05 21.80	90 05 40 270 00	Offshore range mark 2 (west shore Point Roberts).	1, 579. 8 98. 45	Offshore range mark 3 (east side Bound- ary Bay).	49 00 08. 21 122 46 50. 14	0 / // 90 05 11 270 05 11	Offshore range mark(west side Boundary Bay). Mon. 5	17, 440. 0 1, 801. 9
		270 06	Shore range mark 2 (west shore Point Roberts).	94. 30	Mon. 5	49 00 08.11 122 45 21.48	90 06 18	Offshore range mark (east side Boundary Bay).	1, 801. 9
Mon. 1	49 00 08.03 123 05 16.95	90 00 269 57 30	Shore range mark ² (west shore Point Roberts). Mon. 0 (zero) Mon. 2	98. 45 1, 027. 8			269 57 56 270 06 18	Mon. 5-A	8. 99 5. 50
Mon. 2	49 00 08.05 123 04 26.39	89 58 08 269 57 38	Mon. 1 Mon. 2-A	1, 027. 8 504. 26	Mon. 5-A	49 00 08.11 122 45 21.04	89 57 56 269 57 56	Mon. 5 Mon. 5-B	8. 99 14. 13
Mon. 2-A	49 00 08.06 123 04 01.58	89 57 56 269 57 56	Mon. 2 Mon. 2-B	504. 26 27. 11	Mon. 5-B	49 00 08.11 122 45 20.35	89 57 57 269 57 57	Mon. 5-A Mon. 5-C	14. 13 63. 19
Mon. 2-B	49 00 08.06 123 04 00.24	89 57 57 269 57 57	Mon. 2-A Mon. 3	27. 11 491. 85	Mon. 5-C	49 00 08.11 122 45 17.24	89 57 59 269 57 59	Mon. 5-B Mon. 5-D	
Mon. 3	49 00 08.07 123 03 36.04	89 58 16 269 57 04	Mon. 2-B Mon. 3-A	491. 85 1, 694. 7	Mon. 5-D	49 00 08.11 122 45 16.55	89 58 00 269 58 00	Mon. 5-C Mon. 5-E	13. 92 1, 468. 7
Mon. 3-A	49 00 08.10 123 02 12.66	89 58 07 269 58 07	Mon. 3 Mon. 3-B	1, 694. 7 18. 06	Mon. 5-E	49 00 08.13 122 44 04.29	89 58 54 269 58 54	Mon. 5-D Mon. 5-F	1, 468. 7 48. 25
Mon. 3-B	49 00 08.10 123 02 11.77	89 58 08 269 58 08	Mon. 3-A Mon. 4	18. 06 122. 19	Mon. 5-F	49 00 08.13 122 44 01.92	89 58 56 269 58 56	Mon. 5–E Mon, 6	48. 25 340. 8
Mon. 4	49 00 08.11 123 02 05.76	89 58 13 269 53 40	Mon. 3-B Shore range	122. 19 75. 11	Mon. 6	49 00 08.14 122 43 45.15	89 59 09 269 56 31	Mon. 5-F Mon. 7	340. 8 1, 208. 0
			mark (west side Boundary Bay).		Mon. 7	49 00 08.17 122 42 45.72	89 57 16 269 56 28	Mon. 6 Mon. 8	
Shore range mark 3 (west	49 00 08.11 123 02 02.07	89 53 43 269 53 43	Mon. 4 Offshore range	75. 11 1, 095. 1	Mon. 8	49 00 08.22 122 41 23.40	89 57 30 269 56 34	Mon. 7 Mon. 9	1, 673. 1 1, 613. 3
side Bound- ary Bay).			mark (west side Boundary Bay).		Mon. 9	49 00 08.26 122 40 04.03	89 57 34 269 56 09	Mon. 8 Mon. 10	
Offshore range mark 3 (west	49 00 08.18 123 01 08.19	89 54 23	Shore range mark (west	1, 095. 1	Mon. 10	49 00 08.32 122 38 45.27	89 57 08 269 55 25	Mon. 9 Mon. 11	1, 600. 8 517. 9
side Bound- ary Bay).		269 54 23	side Boundary Bay). Offshore range	17, 440. 0	Mon. 11	49 00 08.34 122 38 19.79	89 55 44 269 56 38	Mon. 10 Mon. 12	
			mark (east side Boundary Bay).		Mon. 12	49 00 08.37 122 37 26.23	89 57 19 269 56 37	Mon. 11 Mon. 13	

This range mark pertains to the boundary through Georgia Strait. It is included here as a reference. For geographic position see p. 160.
 This range mark is also a boundary mark.
 This range mark is on the prolongation of the boundary course Monument 4-Monument 5. For geographic position see p. 160.

¹ A geographic position is said to be on the North American datum of 1927 when the station is connected with the stations of the network of arcs of the readjusted first-order triangulation by continuous triangulation or traverse computed on the Clarke spheroid of 1866, as expressed in meters.

					1			1	1
Station	Latitude and longitude	Azimuth	To station	Distance (meters)	Station	Latitude and longitude	Azimuth	To station	Distance (meters)
Mon. 13	6 / // 49 00 08.41 122 36 03.08	89 57 40 269 53 34	Mon. 12 Mon. 14	1, 690. 0 1, 621. 5	Mon. 42	9 00 09.31 122 06 30.83	90 00 50 270 04 13	Mon. 41	1, 268. 1 861. 9
Mon. 14	49 00 08.50 122 34 43.31	89 54 34 269 56 14	Mon. 13 Mon. 15	1, 621. 5 1, 527. 7	Mon. 43	49 00 09.27 122 05 48.42	90 04 45 271 11 26	Mon. 42 Mon. 44	861.9
Mon. 15	49 00 08.55 122 33 28.14	89 57 10 269 54 54	Mon. 14 Mon. 16	1, 527. 7 1, 408. 8	Mon. 44	49 00 07.37 122 03 30,68	91 13 09 271 13 12	Mon. 43 Mon. 44-A	
Mon. 16	49 00 08.61 122 32 18.83	89 55 46 269 55 49	Mon, 15 Mon, 17	1, 408, 8	Mon. 44-A	49 00 05.77 122 01 37,94	91 14 37 271 14 37	Mon. 44 Mon. 45	
Mon. 17		89 56 33 269 56 06	Mon. 16 Mon. 18	1, 176, 9	Mon. 45	49 00 05.31 122 01 05.78	91 15 02 271 14 40	Mon. 44-A Mon. 46	1 2 m
Mon. 18	The second second second	89 56 30 269 55 56	Mon. 17 Mon. 19		Mon. 46	49 00 02.81 121 58 13.10	91 16 50 271 16 39	Mon. 45 Mon. 47	STORING STATE
Mon. 19		89 56 46 269 55 33	Mon. 18 Mon. 19-A	35	Mon. 47	49 00 00.88 121 56 03.06	91 18 17 271 18 47	Mon. 46 Mon. 48	2, 643. 9
Mon. 19-A	49 00 08.76 122 29 01.50	89 56 02 269 56 02	Mon. 19 Mon. 20	873. 1	Mon. 48	The same of the sa	91 22 37 271 22 29	Mon. 47 Mon. 49	6, 208. 1
Mon. 20		89 56 29 269 54 56	Mon. 19-A Mon. 21	641.7	Mon. 49	48 59 53.83 121 48 31.91	91 24 19 271 24 26	Mon. 48 Mon. 50	2, 964. 8 2, 964. 8
Mon. 21	The second second second second	89 56 40 269 57 02	Mon. 20 Mon. 22		Mon. 50	48 59 50.85 121 45 29.87	91 26 43	Mon. 49	3, 701. 5
Mon. 22		89 57 34 269 58 50	Mon. 21 Mon. 23	848. 4	Mon. 51	48 59 50.84	270 01 36 90 02 00 269 59 06	Mon. 50	647. 2
Mon. 23		89 59 49 269 57 06	Mon. 22 Mon. 24		Mon. 52	121 44 58. 03 48 59 50. 85	89 59 32	Mon. 52 Mon. 51 Mon. 53	706. 8
Mon. 24		89 57 41 269 56 54	Mon. 23 Mon. 25	931. 5 678. 9	Mon. 53	121 44 23, 26 48 59 54, 33	268 49 19 88 52 38	Mon. 52	5, 363. 3 5, 363. 3
Mon. 25	The state of the s	89 57 19 269 55 29	Mon. 24 Mon. 26	678. 9	Mon. 54	121 39 59. 46 48 59 56. 15	268 49 00 88 50 42	Mon. 53	2, 753. 7 2, 753. 7
Mon. 26		89 56 29 269 56 48	Mon. 25	1,612.8	Mon, 55	121 37 44. 01 48 59 56. 88	268 58 14 88 59 01	Mon. 54	1, 256. 9 1, 256. 9
Mon. 27		89 57 15	Mon. 26		Mon. 56	121 36 42. 19 48 59 57. 93	269 25 48 89 27 53	Mon. 55	3, 369. 7 3, 369. 7
Mon. 28	49 00 09,08	269 56 14 89 56 48	Mon. 27	931. 4 931. 4 1, 406. 9	Mon. 57	121 33 56, 42 48 59 58, 80	269 27 31 89 29 19	Mon. 56	2, 922. 4 2, 922. 4
Mon. 29	122 20 13, 80 49 00 09, 11	269 56 46 89 57 38	Mon. 29 Mon. 28	1, 406. 9	Mon. 58		269 50 06 89 50 15	Mon. 57	257. 0 257. 0
Mon. 30		269 55 26 89 56 36	Mon. 30 Mon. 29	1, 881. 0 1, 881. 0	Mon. 59	121 31 20.01 48 59 59.23	269 36 57 89 38 08	Mon. 58	1, 916. 5 1, 916. 5
Mon. 31 *	122 17 32.04 49 00 09.24	269 56 03 89 57 08	Mon. 30	1, 752. 0 1, 752. 0	Mon, 60	121 29 45, 72 48 59 59, 56	269 37 56 89 38 57	Mon. 60 Mon. 59	1, 640. 0 1, 640. 0
Mon. 31-A	122 16 05.84 49 00 09.25	269 56 48 89 56 59	Mon. 31	310.9	Mon. 61	121 28 25. 04 48 59 59. 98	269 39 03 89 40 24	Mon. 60	2, 184. 1 2, 184. 1
Mon. 31-B	122 15 50. 54 49 00 09. 25	269 56 59 89 57 00	Mon. 31-B Mon. 31-A	37. 00 37. 00	Mon. 62	121 26 37, 59	269 40 48 89 42 08	Mon. 61	2, 141. 4
Mon. 32	122 15 48, 72 49 00 09, 28	269 57 00 89 57 36	Mon. 31-B	951. 2	Mon, 63	121 24 52, 24	269 57 37 89 58 06	Mon. 62	779. 8
Mon. 33	122 15 01, 92 49 00 09, 32	269 56 18 89 57 08	Mon. 32		Mon. 64	121 24 13, 88 49 00 01, 70	268 45 43 88 46 54	Mon. 63	1, 914. 3
Mon. 34	122 13 55.31 49 00 09.32	269 59 36 89 59 42	Mon. 34 Mon. 33	184. 6 184. 6	Mon, 65	121 22 39. 72 49 00 03. 84	268 48 20 88 50 20	Mon. 65	3, 227. 9
Mon. 35	122 13 46, 23 49 00 09, 35	269 56 32 89 57 13	Mon. 34	1, 100. 0 1, 100. 0	Mon. 66	121 20 00. 94 49 00 03. 76	270 03 06	Mon. 66	2, 425. 5
Mon. 36	122 12 52.11 49 00 09.34	270 01 01 90 01 41	Mon. 35	1, 063. 6	Mon. 67	121 18 01. 61 49 00 03. 78	90 04 37 269 52 35 89 52 46	Mon. 65	2, 425. 5 300. 9 300. 9
Mon. 37	122 11 59.78 49 00 09.33	270 00 48 90 01 29	Mon. 36	1, 126. 6 1, 126. 6	Mon. 68	121 17 46. 81 49 00 03. 33	270 13 02 90 15 08	Mon. 67	3, 393, 8
Mon. 38	122 11 04.35 49 00 09.32	90 00 55	Mon. 37	1, 780. 1 1, 780. 1	Mon. 69	121 14 59. 84 49 00 02. 61	270 17 01 90 19 36	Mon. 69 Mon. 68	4, 167. 3 4, 167. 3
Mon. 39	122 09 36.77 49 00 09.32	90 00 44 90 00 44	Mon. 39 Mon. 38	974. 2 974. 2	Mon. 70	121 11 34.82 49 00 02.12	90 18 44	Mon. 69	2, 873. 8 2, 873. 8
Mon. 40	122 08 48, 84 49 00 09, 32 122 08 22, 36	90 00 02 270 00 04	Mon. 39	538. 1 538. 1	Mon. 71	121 09 13. 43 49 00 01. 31	270 18 16 90 21 00	Mon. 70	4, 424. 2
Mon, 41	49 00 09. 31 122 07 33. 22	90 00 41 270 00 03	Mon. 40 Mon. 42	998. 9 998. 9 1, 268. 1	Mon. 72	121 05 35, 77 49 00 01, 30 121 03 40, 98	269 59 21 90 00 48 269 53 22	Mon. 72	2, 333. 1 2, 333. 1 3, 158. 1
*A bronze di			UNITED STATE		at flush with the or	round in the te			0, 100, 1

^{*}A bronze disk stamped "CANADA—UNITED STATES, 30-A", set flush with the ground in the top of a concrete pier, is 37.44 meters from Monument 31 in azimuth 89° 57′08″.

Station	Latitude and longitude	Azimuth	To station	Distance (meters)	Station	Latitude and longitude	Azimuth	To station	Distance (meters)
Mon. 73	9 00 01.47 121 01 05.61	99 55 19 269 54 59	Mon. 72 Mon. 74	3, 158. 1 1, 371. 5	Mon. 105	0 / // 48 59 59.91 119 52 41.14	89 47 36 269 47 22	Mon. 104 Mon. 106	4, 246. 1 2, 665. 2
Mon. 74	49 00 01.53 120 59 58.14	89 55 50 269 55 54	Mon. 73 Mon. 75	1, 371. 5 3, 390. 3	Mon. 106	49 00 00, 20 119 50 30, 02	89 49 01 269 49 05	Mon. 105 Mon. 107	2, 665. 2 3, 922. 5
Mon. 75	49 00 01.63 120 57 11.34	89 58 00 269 58 10	Mon. 74 Mon. 76	3, 390. 3 3, 207. 5	Mon. 107	49 00 00.56 119 47 17.04	89 51 30 269 51 31	Mon. 106 Mon. 108	3, 922. 5 2, 340. 5
Mon. 76	49 00 01.65 120 54 33.54	90 00 09 270 00 04	Mon. 75 Mon. 77		Mon. 108	49 00 00.73 119 45 21,90	89 52 58 269 53 06	Mon. 107 Mon. 109	2, 340. 5 1, 916. 6
Mon. 77	49 00 01.61 120 51 34.38	90 02 19 270 02 06	Mon. 76 Mon. 78	3, 641. 6 4, 292. 4	Mon. 109	49 00 00.84 119 43 47.60	89 54 17 269 59 45	Mon. 108 Mon. 110	1, 916. 6 2, 198. 6
Mon. 78		90 04 45 270 05 04	Mon. 77 Mon. 79		Mon. 110	49 00 00.84 119 41 59.44	90 01 07 270 00 06	Mon. 109 Mon. 111	2, 198. 6 764. 3
Mon. 79	49 00 01.31 120 45 37.36	90 06 54 270 06 38	Mon. 78 Mon. 80	2, 964. 4 4, 516. 9	Mon. 111	49 00 00.83 119 41 21.84	90 00 34 269 59 37	Mon. 110 Mon. 112	764. 3 2, 664. 0
Mon. 80		90 09 26 270 10 17	Mon. 79 Mon. 81		Mon. 112	49 00 00, 82 119 39 10, 77	90 01 16 270 01 08	Mon. 111 Mon. 113	2, 664. 0 1, 345. 2
Mon. 81		90 10 59 269 59 01	Mon. 80 Mon. 82		Mon. 113	49 00 00.80 119 38 04.59	90 01 58 269 58 34	Mon. 112 Mon. 114	1,345.2 4,026.9
Mon. 82		89 59 42 269 35 27	Mon. 81 Mon. 83		Mon. 114	49 00 00, 81 119 34 46, 48	90 01 04 269 58 34	Mon. 113 Mon. 115	4, 026. 9 4, 193. 2
Mon. 83	49 00 01. 26 120 38 38. 39	89 36 33 269 36 32	Mon. 82 Mon. 84		Mon. 115	49 00 00, 82 119 31 20, 18	90 01 09 270 03 52	Mon. 114 Mon. 116	4, 193. 2
Mon. 84		89 38 44 269 38 43	Mon. 83 Mon. 85	The second	Mon. 116		90 04 41 269 59 35	Mon. 115 Mon. 116-A	1, 314, 5
Mon. 85		89 40 24 270 00 40	Mon. 84 Mon. 86		Mon. 116-A	49 00 00.75 119 27 39.94	90 01 32 270 01 32	Mon. 116 Mon. 116-B	3, 162. 0
Mon. 86	The second second second	90 01 01 269 59 51	Mon. 85 Mon. 87		Mon. 116-B		90 01 33 270 01 33	Mon. 116-A Mon. 117	17.78
Mon. 87	49 00 02, 52 120 31 25, 25	90 01 04 270 01 13	Mon. 86 Mon. 88	1, 963. 1 3, 131. 8	Mon. 117		90 01 38 269 59 36	Mon. 116-B Mon. 118	142.3
Mon. 88	49 00 02.46 120 28 51.17	90 03 10 270 02 46	Mon. 87 Mon. 89		Mon. 118	000000000000000000000000000000000000000	90 01 01 269 59 09	Mon. 117 Mon. 119	2, 293, 9
Mon. 89	49 00 02.31 120 25 41.66	90 05 09 270 05 20	Mon. 88 Mon. 90	3, 852. 0	Mon. 119		90 00 19 269 58 05	Mon. 118 Mon. 120	1, 890. 5
Mon. 90		90 06 32 270 06 40	Mon. 89 Mon. 91		Mon. 120	49 00 00.76 119 22 51.80	89 59 01 270 00 21	Mon. 119 Mon. 121	1, 512, 3
Mon. 91	7000 000 000 000	90 09 10 270 09 08	Mon. 90 Mon. 92	4, 047. 1	Mon. 121	49 00 00, 73 119 20 24, 85	90 02 12 269 59 31	Mon. 120 Mon. 122	2, 986, 8
Mon. 92		90 10 08 270 09 55	Mon. 91 Mon. 93		Mon. 122		90 00 53 270 00 29	Mon. 121 Mon. 123	2, 197. 0
Mon, 93		90 11 49 270 12 12	Mon. 92 Mon. 94	3, 073. 9	Mon. 123		90 02 34 269 59 22	Mon. 122	3, 350, 7
Mon. 94	0.000	90 14 51 270 14 39	Mon. 93 Mon. 95		Mon. 124		90 01 15 269 59 07		3, 033, 7
Mon. 95		90 16 36 270 16 20	Mon. 94 Mon. 96	221	Mon. 125		90 00 23 269 36 31		
Mon. 96	48 59 59.96 120 08 27.77	90 18 07 270 18 16	Mon. 95 Mon. 97	2, 896. 4	Mon. 126	49 00 00, 88 119 10 55, 32	89 37 06 270 10 34	Mon. 125 Mon. 127	939. 5
Mon. 97	The second second	90 20 53 270 21 02	Mon. 96 Mon. 98	4, 221. 4	Mon. 127	49 00 00, 68 119 09 22, 94	90 11 44 269 58 14		1, 877. 6
Mon. 98		90 22 12 270 22 10	Mon. 97 Mon. 99	1, 873. 8	Mon. 128	49 00 00.70 119 07 39.53	89 59 32 269 58 45	Mon. 127	2, 101. 9
Mon. 99		90 23 08 269 56 30	Mon. 98. Mon. 100.	1, 585. 4	Mon. 129	49 00 00.71 119 06 00.55	90 00 00 270 01 03	Mon. 128	2,011.9
Mon. 100	48 59 58.50 120 01 23.43	89 57 05 269 51 14	Mon. 99 Mon. 101	944. 8	Mon. 130	49 00 00.68 119 04 23,30	90 02 16 270 01 05	Mon. 129	1, 976. 9
Mon. 101		89 52 13 269 42 08	Mon. 100 Mon. 102	1,600.3	Mon. 131	49 00 00.65 119 02 45.45	90 02 19 269 58 37	Mon. 130	1, 988, 8
Mon. 102		89 43 08 269 42 57	Mon. 101 Mon. 103	1, 615. 6	Mon. 1,32	49 00 00.66 119 00 56.64	89 59 59	Mon. 131	2, 211. 7
Mon. 103		89 44 33 269 45 15	Mon. 102 Mon. 104	2, 568. 7	Mon. 133	49 00 00, 69 118 58 22, 46	90 00 05	Mon. 132	3, 133, 9
Mon. 104		89 45 36	Mon. 103 Mon. 105	585. 6	Mon. 134	49 00 00.71 118 57 21,60	89 59 04	Mon. 133	1,237,0

Station	Latitude and longitude	Azimuth	To station	Distance (meters)	Station	Latitude and longitude	Azimuth	To station	Distance (meters)
Mon. 135	49 00 00.70 118 56 29.36	90 01 00 269 59 06	Mon. 134 Mon. 136		Mon. 165-B	0 / // 49 00 00.62 118 13 21.53	90 00 35 270 00 35	Mon. 165-A Mon. 166	21. 34 1, 184. 2
Mon. 136	49 00 00.70 118 54 32.76	90 00 34 269 54 21	Mon. 135 Mon. 137		Mon, 166	49 00 00.61 118 12 23.27	90 01 19 269 59 18	Mon. 165-B Mon. 167	1, 184. 2 2, 524. 7
Mon. 137	49 00 00.74 118 53 53.34	89 54 51 270 06 04	Mon. 136 Mon. 138	801. 2 1, 410. 8	Mon. 167	49 00 00.60 118 10 19.06	90 00 52 269 58 32	Mon. 166 Mon. 168	2, 524. 7 650. 7
Mon. 138	49 00 00.66 118 52 43.94	90 06 56 269 58 20	Mon. 137 Mon. 139	1, 410. 8 3, 342. 2	Mon. 168	49 00 00.61 118 09 47.05	89 58 56 269 51 59	Mon. 167 Mon. 169	650. 7 5, 047. 6
Mon. 139	49 00 00.68 118 49 59.51	90 00 24 269 59 34	Mon. 138 Mon. 140	3, 342. 2 2, 278. 6	Mon. 169	49 00 00.92 118 05 38.72	89 55 06 269 52 27	Mon. 168 Mon. 170	5, 047. 6 2, 391. 2
Mon. 140	49 00 00, 67 118 48 07, 41	90 00 58 269 56 01	Mon. 139 Mon. 141	2, 278. 6 1, 149. 8	Mon. 170	49 00 01.07 118 02 41.08	89 53 56 269 53 09	Mon. 169 Mon. 171	2, 391. 2 1, 721. 2
Mon. 141	49 00 00.71 118 47 10.84	89 56 44 270 03 31	Mon. 140 Mon. 142	1, 149. 8	Mon. 171	49 00 01.17 118 02 16.40	89 54 13 269 51 42	Mon. 170 Mon. 172	1, 721. 2 3, 430. 7
Mon. 142	49 00 00.68 118 46 33,17	90 03 59 269 59 49	Mon. 141 Mon. 143	765. 6 1, 269. 6	Mon. 172	49 00 01.41 117 59 27.61	89 53 49 269 51 34	Mon. 171 Mon. 173	3, 430. 7 4, 309. 3
Mon. 143	49 00 00.68 118 45 30.72	90 00 36 270 00 59	Mon. 142 Mon. 144	1, 269. 6	Mon. 173	49 00 01.70 117 55 55.61	89 54 14 269 54 17	Mon. 172 Mon. 174	4, 309. 3 2, 860. 0
Mon. 144	49 00 00.67 118 44 46.24	90 01 32 270 00 10	Mon. 143 Mon. 145	903. 9 914. 9	Mon. 174	49 00 01.82 117 53 34.90	89 56 03 269 52 34	Mon. 173 Mon. 174-A	2, 860. 0 4, 563. 6
Mon. 145	49 00 00.67 118 44 01.23	90 00 44 269 59 46	Mon. 144 Mon. 146		Mon. 174-A	49 00 02.08 117 49 50.38	89 55 24 269 55 24	Mon. 174 Mon. 174-B	4, 563. 6 17. 5
Mon. 146		90 00 22 270 01 44	Mon. 145 Mon. 147	952.9	Mon, 174-B	49 00 02.08 117 49 49.52	89 55 24 269 55 24	Mon. 174-A Mon. 175	17. 5 26. 1
Mon. 147		90 02 24 270 02 39	Mon. 146 Mon. 148	1,069.8	Mon. 175	49 00 02.08 117 49 48.23	89 55 25 269 55 40	Mon. 174-B Mon. 176	26. 1 4, 224. 8
Mon. 148		90 03 28 269 56 45	Mon. 147 Mon. 149	1, 306. 2	Mon. 176	49 00 02.21 117 46 20.38	89 58 17 269 48 44	Mon. 175 Mon. 177	4, 224. 8 2, 615. 8
Mon. 149	49 00 00, 65 118 39 52, 99	89 57 49 270 00 17	Mon. 148 Mon. 150	1, 716. 9	Mon. 177	49 00 02.46 117 44 11.68	89 50 22 269 50 43	Mon. 176 Mon. 178	2, 615. 8 2, 942. 4
Mon. 150		90 01 33 269 58 53	Mon. 149 Mon. 151	2, 052. 5	Mon. 178	49 00 02.70 117 41 46.92	89 52 32 269 54 24	Mon. 177 Mon. 179	2, 942. 4 2, 948. 7
Mon. 151	Constitution of the second	90 01 07 269 59 47	Mon. 150 Mon. 152	3, 612. 9	Mon. 179	49 00 02.82 117 39 21.85	89 56 14 269 50 36	Mon. 178 Mon. 180	2, 948. 7 1, 439. 4
Mon. 152		90 01 28 269 58 32	Mon. 151 Mon. 153	2, 727. 5	Mon. 180	49 00 02.95 117 38 11.04	89 51 30 269 59 31	Mon. 179 Mon. 181	1, 439. 4 724. 7
Mon. 153		89 59 38 269 59 06	Mon. 152 Mon. 154	1, 791. 4	Mon. 181	49 00 02.95 117 37 35.38	89 59 58 270 02 51	Mon. 180 Mon. 182	724. 7 3, 463. 2
Mon. 154	Toronto and the same	90 00 05 270 00 23	Mon. 153 Mon. 155	1, 592. 4	Mon. 182	49 00 02.82 117 34 45.00	90 05 00 270 05 01	Mon. 181 Mon. 183	3, 463. 2 5, 253. 5
Mon. 155		90 00 53 269 57 23	Mon. 154 Mon. 156	805. 8	Mon. 183	49 00 02.49 117 30 26.54	90 08 16 -270 07 52	Mon. 182 Mon. 184	
Mon. 156		89 58 36 269 56 58	Mon. 155 Mon. 157		Mon. 184	49 00 01.96 117 25 41.17	90 11 28 270 12 07	Mon. 183 Mon. 185	
Mon. 157		89 57 36 270 03 14	Mon. 156 Mon. 158		Mon. 185	49 00 01.62 117 23 23.51	90 13 51 270 14 02	Mon. 184 Mon. 186	2, 798. 0 1, 622. 8
Mon. 158	49 00 00.62 118 25 18.21	90 04 36 270 03 21	Mon. 157 Mon. 159	2, 195. 9 2, 425. 9	Mon. 186	49 00 01.40 117 22 03.67	90 15 03 269 57 29	Mon. 185 Mon. 187	1, 622. 8 1, 012. 3
Mon. 159	2000 Se-300 ASS ASS ASS	90 04 51 269 49 19	Mon. 158 Mon. 160	2, 425. 9	Mon. 187	49 00 01.42 117 21 13.87	89 58 07 270 02 02	Mon. 186 Mon. 188	1, 012. 3 214. 6
Mon. 160		89 49 53 269 58 36	Mon. 159 Mon. 161	910. 4 3, 809. 5	Mon. 188	49 00 01.42 117 21 03.31	90 02 10 270 32 56	Mon. 187 Mon. 188-A	214. 3, 821.
Mon. 161	1 1 2 5 5	90 00 57 270 01 45	Mon. 160 Mon. 162	3, 809. 5	Mon. 188-A	49 00 00.19 117 17 55.32	90 35 18 270 35 18	Mon. 188 Mon. 188-B	3, 821. 2 24.
Mon. 162	2007 000 000 000	90 03 29 269 57 42	Mon. 161 Mon. 163	2, 808. 2	Mon. 188-B	49 00 00.18 117 17 54.11	90 35 19 270 35 19	Mon. 188-A Mon. 189	24. 683.
Mon. 163	The second second	89 59 28 269 57 24	Mon. 162 Mon. 164	2, 854. 7	Mon. 189	48 59 59.95 117 17 20.50	90 35 44 270 33 39	Mon. 188-B Mon. 190	Treated and
Mon. 164		89 58 11 270 00 17	Mon. 163 Mon. 165	1, 274. 0	Mon. 190	48 59 58.88 117 14 38.46	90 35 41 270 35 22	Mon. 189 Mon. 191	3, 293. 3, 276.
Mon. 165		90 00 33 270 00 33	Mon. 164 Mon. 165-A	437. 6	Mon. 191	48 59 57.76 117 11 57.30	90 37 23 270 37 50	Mon. 190 Mon. 192	
Mon. 165-A	The same of the same	90 00 34 270 00 34	Mon. 165 Mon. 165_B	25. 65	Mon. 192	48 59 56.44 117 09 00.56	90 40 03 270 42 05	Mon. 191 Mon. 193	3, 592. 7

Station	Latitude and longitude	Azimuth	To station	Distance (meters)	Station	Latitude and longitude	Azimuth	To station	Distance (meters)
Mon. 193	6 / // 48 59 55.96 117 08 01.76	90 42 50 269 37 49	Mon, 192 Mon, 194	1, 195. 2 4, 552. 8	Mon. 223	9 00 03.54 115 58 16.08	o / // 89 55 22 269 55 28	Mon. 222 Mon. 224	4, 409. 7 3, 804. 9
Mon. 194	48 59 56.85 117 04 17.79	89 40 38 269 40 10	Mon. 193 Mon. 195	4, 552. 8 3, 213. 2	Mon. 224	49 00 03.66 115 55 08.89	89 57 50 269 56 27	Mon. 223 Mon. 225	3, 804. 9 1, 986. 8
Mon. 195	48 59 57.42 117 01 39.71	89 42 09 269 42 02	Mon. 194 Mon. 196	3, 213. 2 2, 755. 2	Mon. 225	49 00 03.71 115 53 31.14	89 57 41 269 59 36	Mon. 224 Mon. 226	1, 986. 8 2, 308. 5
Mon. 196	48 59 57.87 116 59 24.16	89 43 45 269 44 09	Mon. 195 Mon. 197	2, 755. 2 4, 556. 7	Mon. 226	49 00 03.71 115 51 37.56	90 01 02 270 01 05	Mon. 225 Mon. 227	2, 308. 5 4, 562. 5
Mon. 197	48 59 58.48 116 55 39.99	89 46 59 269 47 05	Mon. 196 Mon, 198	4, 556. 7 2, 945. 9	Mon. 227	49 00 03.60 115 47 53.09	90 03 54 270 03 10	Mon. 226 Mon. 228	4, 562. 5 2, 371. 4
Mon. 198		89 48 54 269 48 42	Mon. 197 Mon. 199		Mon. 228	49 00 03.51 115 45 56.42	90 04 38 270 04 58	Mon. 227 Mon. 229	2, 371. 4 2, 792. 7
Mon. 199	48 59 59.23 116 49 38.42	89 51 26 269 50 51	Mon. 198 Mon. 200	4, 403. 4 2, 914. 9	Mon. 229	49 00 03.36 115 43 39.02	90 06 42 270 06 33	Mon. 228 Mon. 230	2, 792. 7 2, 621. 8
Mon. 200	48 59 59.46 116 47 15.02	89 52 39 269 53 04	Mon. 199 Mon. 201		Mon. 230	49 00 03.18 115 41 30.04	90 08 10 270 08 18	Mon. 229 Mon. 231	2, 621. 8 2, 621. 8 2, 736. 4
Mon. 201	48 59 59.60 116 45 15.46	89 54 34 269 54 34	Mon. 200 Mon. 202	2, 430. 2 2, 430. 2 2, 043. 0	Mon. 231	49 00 02.94 115 39 15.41	90 09 59 269 59 48	Mon. 230 Mon. 232	2, 736. 4
Mon. 202		89 55 50 269 55 41	Mon. 201 Mon. 203	2, 043. 0	Mon. 232	49 00 02.94 115 38 53.32	90 00 05 270 01 24	Mon. 231 Mon. 233	448. 9 448. 9
Mon. 203	48 59 59.76	89 56 54	Mon. 202	1, 975. 2 1, 975. 2	Mon. 233	49 00 02, 94	90 01 34	Mon. 232	292. 9 292. 9
Mon. 204	116 41 57.78 48 59 59.81	269 57 17 89 59 29	Mon. 204	3, 553. 4 3, 553. 4	Mon. 234	115 38 38.91 49 00 02.94	269 59 51 90 00 22	Mon. 234 Mon. 233 Mon. 235	836. 2 836. 2
Mon. 205	116 39 02.96 48 59 59.80	269 59 18 90 01 19	Mon. 204	3, 259. 3	Mon. 235	115 37 57.78 49 00 02.52	270 09 25 90 11 58	Mon. 234	4, 103. 7 4, 103. 7
Mon, 206	116 36 22.61 48 59 59.75	90 03 23	Mon. 205 Mon. 207	2, 243. 1 2, 243. 1 5, 667. 1	Mon. 236	115 34 35.88 49 00 02.05	270 10 15 90 12 55	Mon. 235 Mon. 237	4, 312. 2 4, 312. 2
Mon. 207	116 34 32.26 48 59 59.77	269 57 47 90 01 18	Mon. 206	5, 667. 1	Mon. 237	115 31 03, 73 49 00 01, 54	270 12 40 90 15 06	Mon. 236	3, 929. 3 3, 929. 3
Mon. 208	49 00 00.75	269 35 02 89 37 45	Mon. 208 Mon. 207 Mon. 209	4, 386. 4 4, 386. 4 3, 106. 6	Mon. 238	115 27 50.42 49 00 00.95	270 14 56 90 17 21	Mon. 238 Mon. 237 Mon. 239	3, 903. 8 3, 903. 8
Mon. 209	116 26 17.65 49 00 01.35	269 38 17 89 40 12	Mon. 208	3, 106. 6	Mon. 239	115 24 38, 41 49 00 00. 28	270 17 15 90 19 37	Mon. 238	3, 810. 2 3, 810. 2
Mon. 210	116 23 44.81 49 00 02.01	269 39 30 89 41 42	Mon. 210 Mon. 209	3, 569. 2 3, 569. 2 1, 552. 9	Mon. 240	115 21 30.96 48 59 59.38	90 22 40 270 22 50	Mon. 240	4, 531. 9 4, 531. 9
Mon. 211	116 20 49. 22 49 00 02. 27	269 41 39 89 42 36	Mon. 209 Mon. 211 Mon. 210	1, 552. 9 1, 552. 9	Mon. 241	115 17 48, 00 48 59 58, 81	270 22 50 90 24 25	Mon. 239 Mon. 241	2, 569. 9 2, 569. 9
Mon. 212	116 19 32.82 49 00 02.81	269 43 02 89 45 16	Mon. 212 Mon. 211	3, 610. 0	Mon. 242	115 15 41.56	269 58 15 89 59 49	Mon. 242	2, 525. 5 2, 525. 5
Mon. 213	116 16 35. 22 49 00 03. 20	269 44 55 89 46 44	Mon. 213 Mon. 212	3, 610. 0 2, 945. 6	Mon. 243	48 59 58.83 115 13 37.31 48 59 58.79	270 00 13 90 02 14	Mon. 241 Mon. 243	3, 268. 9
Mon. 214	116 14 10.30 49 00 02.60	270 35 50 90 36 54	Mon. 213	2, 945. 6 1, 741. 6	Mon. 244	115 10 56.49	269 59 56	Mon. 242 Mon. 244	3, 268. 9 808. 4
	116 12 44.62	270 31 35	Mon. 215	1, 741. 6 1, 410. 9		48 59 58.79 115 10 16.72	90 00 26 270 00 14	Mon. 243 Mon. 245	808. 4 401. 4
Mon. 215	49 00 02.18 116 11 35.21	90 32 27 269 57 02	Mon. 214 Mon. 216	1, 410. 9 841. 2	Mon. 245	48 59 58.79 115 09 56.98	90 00 29 269 57 35	Mon. 244 Mon. 246	401. 4 4, 242. 0
Mon. 216	49 00 02.20 116 10 53.82	89 57 33 269 57 49	Mon. 215 Mon. 216-A	841. 2 98. 82	Mon. 246	48 59 58.83 115 06 28.28	90 00 13 270 00 32	Mon. 245 Mon. 247	4, 242. 0 3, 917. 1
Mon. 216-A	49 00 02.20 116 10 48.96	89 57 52 269 57 52	Mon. 216-B	98. 82 20. 93	Mon. 247	48 59 58.77 115 03 15.57	90 02 58 269 39 35	Mon. 246 Mon. 248	3, 917. 1 4, 223. 1
Mon. 216-B	49 00 02.20 116 10 47.93	89 57 53 269 57 53	Mon. 216-A Mon. 217	20, 93 185, 05	Mon. 248	48 59 59.53 114 59 47.81	89 42 12 269 42 08	Mon. 247 Mon. 249	4, 223. 1 1, 835. 7
Mon, 217	49 00 02.20 116 10 38.82	89 58 00 269 30 33	Mon. 216-B Mon. 218	185. 05 26. 84	Mon. 249	48 59 59.83 114 58 17.50	89 43 17 269 43 13	Mon. 248 Mon. 250	1, 835. 7 3, 613. 2
Mon. 218	49 00 02.21 116 10 37.50	89 30 34 269 46 24	Mon. 217 Mon. 219	26. 84 2, 892. 7	Mon. 250	49 00 00.36 114 55 19.74	89 45 27 269 45 28	Mon. 249 Mon. 251	3, 613. 2 3, 191. 8
Mon. 219	49 00 02.56 116 08 15.19	89 48 13 269 47 40	Mon. 218 Mon. 220	2, 892. 7 2, 175. 8	Mon. 251	49 00 00.77 114 52 42.71	89 47 27 269 47 25	Mon. 250 Mon. 252	3, 191. 8 2, 083. 8
Mon. 220	49 00 02.80 116 06 28.15	89 49 00 269 47 52	Mon. 219 Mon. 221	2, 175. 8 3, 405. 1	Mon. 252	49 00 01.00 114 51 00.19	89 48 42 269 49 02	Mon. 251 Mon. 253	2, 083. 8 4, 004. 2
Mon. 221	49 00 03.15 116 03 40.58	89 49 59 269 52 47	Mon. 220 Mon. 222	3, 405. 1 2, 186. 0	Mon. 253	49 00 01.37 114 47 43.19	89 51 30 269 50 22	Mon. 252 Mon. 254	4, 004. 2 2, 020. 2
Mon. 222	49 00 03, 29 116 01 53, 03	89 54 08 269 52 38	Mon. 221 Mon. 223	2, 186. 0 4, 409. 7	Mon. 254	49 00 01.54 114 46 03.81	89 51 37 269 59 55	Mon. 253 Mon. 255	2, 020. 2 672, 6

Station	Latitude and longitude	Azimuth	To station	Distance (meters)	Station	Latitude and longitude	Azimuth	To station	Distance (meters)
Mon. 255	0 / // 49 00 01, 54 114 45 30, 71	° ' '' 90 00 20 269 41 06	Mon. 254 Mon. 256	672. 6 2, 376. 6	Mon. 287	0 / // 48 59 52.58 113 29 35.26	o / // 89 49 37 269 48 10	Mon. 286 Mon. 288	2, 404. 5 2, 437. 1
Mon. 256	49 00 01, 95 114 43 33, 80	89 42 34 269 42 30	Mon. 255 Mon. 257	2, 376. 6 4, 072. 5	Mon. 288	48 59 52.84 113 27 35.37	89 49 41 269 53 33	Mon. 287 Mon. 289	2, 437. 1 2, 059. 6
Mon. 257	49 00 02.57 114 40 13.44	89 45 01 269 43 49	Mon. 256 Mon. 258	4, 072. 5 3, 672. 5	Mon. 289	48 59 52.95 113 25 54.05	89 54 49 269 51 51	Mon. 288 Mon. 290	2, 059. 6 3, 260. 6
Mon. 258		89 46 06 269 47 36	Mon. 257 Mon. 259	3, 672. 5 3, 432. 8	Mon. 290	48 59 53.17 113 23 13.64	89 53 52 269 51 48	Mon. 289 Mon. 290-A	3, 260. 6 654. 0
Mon. 259	49 00 03.46 114 34 23.87	89 49 43 269 48 58	Mon. 258 Mon. 260	3, 432. 8 2, 983. 7	Mon. 290-A	48 59 53, 22 113 22 41, 46	89 52 12 269 52 12	Mon. 290 Mon. 290-B	654, 0 24, 76
Mon. 260	49 00 03.74 114 31 57.08	89 50 49 269 50 49	Mon. 259 Mon. 261	2, 983. 7 3, 996. 8	Mon. 290-B	48 59 53. 22 113 22 40. 24	89 52 13 269 52 13	Mon. 290-A Mon. 291	24. 76 2, 391. 6
Mon. 261	49 00 04 04 114 28 40 44	89 53 17 270 00 28	Mon. 260 Mon. 262	3, 996. 8 1, 082. 6	Mon. 291	48 59 53.38 113 20 42.59	89 53 42 269 52 09	Mon. 290-B Mon. 292	2, 391. 6 2, 219. 1
Mon. 262	49 00 04.03 114 27 47.18	90 01 08 269 57 23	Mon. 261 Mon. 263	1, 082. 6 3, 588. 2	Mon. 292	48 59 53.53 113 18 53.42	89 53 31 269 52 06	Mon. 291 Mon. 293	2, 219. 1 2, 080. 9
Mon. 263	49 00 04.08 114 24 50.64	89 59 37 269 59 21	Mon. 262 Mon. 264	3, 588. 2 1, 816. 0	Mon. 293	48 59 53.67 133 17 11.04	89 53 24 269 52 39	Mon. 292 Mon. 294	2, 080. 9 1, 980. 5
Mon. 264	49 00 04.08 114 23 21.30	90 00 28 269 59 36	Mon. 263 Mon. 265	1, 816. 0 1, 575. 5	Mon. 294	48 59 53.79 113 15 33.61	89 53 53 269 52 41	Mon. 293 Mon. 295	1, 980. 5 2, 628. 3
Mon. 265	49 00 04.08 114 22 03.78	90 00 35 269 58 38	Mon. 264 Mon. 266	1, 575. 5 495. 4	Mon. 295	48 59 53.95 113 13 24.31	89 54 19 269 52 04	Mon. 294 Mon. 296	2, 628. 3 1, 170. 7
Mon. 266	49 00 04.09 114 21 39.41	89 58 57 270 33 04	Mon. 265 Mon. 267	495. 4 2, 971. 1	Mon. 296	48 59 54.04 113 12 26.72	89 52 47 269 51 02	Mon. 295 Mon. 297	1, 170. 7 2, 567. 8
Mon. 267	49 00 03.14 114 19 13.24	90 34 54 270 35 20	Mon. 266 Mon. 268	2, 971. 1 4, 458. 6	Mon. 297	48 59 54. 24 113 10 20, 39	89 52 37 269 51 17	Mon. 296 Mon. 298	2, 567. 8 2, 333. 6
Mon. 268	49 00 01.60 114 15 33.90	90 38 06 270 37 53	Mon. 267 Mon. 269	4, 458. 6 4, 360. 8	Mon. 298	48 59 54.41 113 08 25.59	89 52 43 269 53 00	Mon. 297 Mon. 299	2, 333. 6 2, 664. 5
Mon. 269	48 59 59.98 114 11 59.37	90 40 35 270 42 29	Mon. 268 Mon. 270	4, 360. 8 1, 502. 6	Mon. 299	48 59 54.57 113 06 14.50	89 54 39 269 52 52	Mon. 298 Mon. 300	2, 664. 5 2, 970. 7
Mon. 270	48 59 59.38 114 10 45.45	90 43 25 270 41 20	Mon. 269 Mon. 271	1, 502. 6 3, 714. 2	Mon. 300	48 59 54.74 113 03 48.36	89 54 42 269 52 40	Mon. 299 Mon. 301	2, 970. 7 1, 952. 6
Mon. 271	48 59 57.89 114 07 42.74	90 43 38 270 43 15	Mon. 270 Mon. 272	3, 714. 2 4, 487. 9	Mon. 301	48 59 54.86 113 02 12.29	89 53 52 269 52 12	Mon. 300 Mon. 302	1, 952. 6 3, 466. 5
Mon. 272 5	48 59 56.00 114 04 01.96	90 46 02 270 05 36	Mon. 271 Mon. 273	4, 487. 9 1, 865. 6	Mon. 302	48 59 55.08 112 59 21.76	89 54 21 270 10 22	Mon. 301 Mon. 303	3, 466. 5 2, 730. 2
Mon. 273	48 59 55.89 114 02 30.18	90 06 45 270 04 50	Mon. 272 Mon. 274	1, 865. 6 4, 955. 4	Mon. 303	48 59 54.80 112 57 07.44	90 12 03 270 10 46	Mon. 302 Mon. 304	2, 730. 2 2, 125. 3
Mon. 274	48 59 55. 60 113 58 26. 40	90 07 54 270 05 03	Mon. 273 Mon. 275	4, 955. 4 2, 649. 0	Mon. 304	48 59 54.57 112 55 22.89	90 12 05 269 56 13	Mon. 303 Mon. 305	2, 125. 3 2, 523. 1
Mon. 275	48 59 55.45 113 56 16.07	90 06 41 270 05 08	Mon. 274 Mon. 276	2, 649. 0 2, 394. 7	Mon. 305	48 59 54.64 112 53 18.76	89 57 47 269 56 04	Mon. 304 Mon. 306	2, 523. 1 2, 480. 1
Mon. 276	48 59 55.32 113 54 18.27	90 06 37 270 28 36	Mon. 275 Mon. 277	2, 394. 7 2, 553. 6	Mon. 306	48 59 54.71 112 51 16.75	89 57 36 269 56 10	Mon. 305 Mon. 307	2, 480. 1 2, 369. 4
Mon. 277	48 59 54.61 113 52 12.64	90 30 10 270 27 39	Mon. 276 Mon. 278		Mon. 307	48 59 54.78 112 49 20.18	89 57 38 269 55 57	Mon. 306 Mon. 308	2, 369. 4 2, 321. 5
Mon. 278	48 59 53.70 113 49 26.28	90 29 44 270 26 47	Mon. 277 Mon. 279	3, 381. 7 4, 021. 4	Mon. 308	48 59 54.85 112 47 25.98	89 57 23 269 55 50	Mon. 307 Mon. 309	2, 321. 5 2, 287. 8
Mon. 279	48 59 52.64 113 46 08.45	90 29 16 270 28 56	Mon. 278 Mon. 280	4, 021. 4 4, 307. 5	Mon. 309	48 59 54.93 112 45 33.42	89 57 15 269 53 11	Mon. 308 Mon. 310	2, 287. 8 2, 554. 3
Mon. 280	48 59 51.41 113 42 36.55	90 31 36 270 28 24	Mon. 279 Mon. 281	4, 307. 5 1, 195. 2	Mon. 310	48 59 55.07 112 43 27.76	89 54 46 269 53 14	Mon. 309 Mon. 311	2, 554. 3 2, 267. 1
Mon. 281	48 59 51.08 113 41 37.75	90 29 09 269 30 04	Mon. 280 Mon. 282	1, 195. 2 3, 208. 1	Mon. 311	48 59 55. 20 112 41 36. 23	89 54 38 269 55 59	Mon. 310 Mon. 312	2, 267. 1 2, 667. 0
Mon. 282	48 59 51.96 113 38 59.94	89 32 03 269 30 30	Mon. 281 Mon. 283	3, 208. 1 3, 017. 0	Mon. 312	48 59 55. 28 112 39 25. 03	89 57 38 269 55 59	Mon. 311 Mon. 313	2, 667. 0 2, 433. 4
Mon. 283	48 59 52.77 113 36 31.52	89 32 22 269 31 13	Mon. 282 Mon. 284	3, 017. 0 1, 993. 1	Mon. 313	48 59 55.36 112 37 25.31	89 57 29 269 56 44	Mon. 312 Mon. 314	2, 433. 4 2, 237. 2
Mon. 284	48 59 53.30 113 34 53.47	89 32 27 270 24 59	Mon. 283 Mon. 285	1, 993. 1 1, 070. 3	Mon. 314	48 59 55.41 112 35 35.25	89 58 07 269 56 34	Mon. 313 Mon. 315	2, 237. 2 2, 168. 2
Mon. 285	48 59 53, 04 113 34 00, 82	90 25 38 270 24 12	Mon. 284 Mon. 286	1, 070. 3 2, 993. 6	Mon. 315	48 59 55.47 112 33 48.58	89 57 55 269 58 24	Mon. 314 Mon. 316	2, 168. 2 2, 428. 3
Mon. 286	48 59 52.33 113 31 33.55	90 26 03 269 48 08	Mon. 285 Mon. 287	2, 993. 6 2, 404. 5	Mon. 316	48 59 55.49 112 31 49.12	89 59 54 269 58 06	Mon. 315 Mon. 317	2, 428. 3 2, 696. 1

⁵ Monument 272 marks the summit of the Rocky Mountains.

Station	Latitude and longitude	Azimuth	To station	Distance (meters)	Station	Latitude and longitude	Azimuth	To station	Distance (meters)
Mon. 317	6 / // 48 59 55, 52 112 29 36, 48	89 59 46 270 19 11	Mon. 316 Mon. 318	2, 696. 1 1, 605. 5	Mon. 349	0 ' '' 48 59 48 38 111 31 12 74	9 50 59 269 49 32	Mon. 348 Mon. 350	1, 841. 2 2, 977. 5
Mon. 318	48 59 55. 22 112 28 17. 50	90 20 11 270 18 34	Mon. 317 Mon. 319	1, 605. 5 2, 420. 7	Mon. 350	48 59 48.65 111 28 46.26	89 51 22 269 49 55	Mon. 349 Mon. 351	2, 977. 5 2, 578. 4
Mon. 319	48 59 54, 78 112*26 18, 41	90 20 04 269 41 39	Mon. 318 Mon. 320	2, 420. 7 3, 372. 8	Mon. 351	48 59 48.88 111 26 39.42	89 51 31 269 49 06	Mon. 350 Mon. 352	2, 578. 4 2, 696. 6
Mon. 320	48 59 55.33 112 23 32.48	89 43 44 269 59 58	Mon. 319 Mon. 321	3, 372. 8 2, 886. 2	Mon. 352	48 59 49.13 111 24 26.76	89 50 46 269 49 28	Mon. 351 Mon. 353	2, 696. 6 1, 801. 9
Mon. 321	48 59 55.30 112 21 10.49	90 01 45 269 59 19	Mon. 320 Mon. 322	2, 886. 2 1, 425. 5	Mon. 353	48 59 49.30 111 22 58.12	89 50 35 269 49 23	Mon. 352 Mon. 354	1, 801. 9 1, 962. 0
Mon. 322	48 59 55.31 112 20 00.36	90 00 12 269 59 06	Mon. 321 Mon. 323	1, 425, 5 2, 612, 5	Mon. 354	48 59 49.49 111 21 21.60	89 50 36 269 49 22	Mon. 353 Mon. 355	1, 962. 0 2, 746. 9
Mon. 323	48 59 55.31 112 17 51.83	90 00 43 269 59 31	Mon. 322 Mon. 324	2, 612. 5 2, 205. 1	Mon. 355	48 59 49.74 111 19 06.46	89 51 04 269 49 32	Mon. 354 Mon. 356	2, 746. 9 2, 989. 0
Mon, 324	48 59 55.30 112 16 03.35	90 00 53 269 59 42	Mon. 323 Mon. 325	2, 205. 1 2, 173. 1	Mon. 356	48 59 50.01 111 16 39.42	89 51 23 269 49 55	Mon. 355 Mon. 357	2, 989. 0 2, 952. 1
Mon. 325	48 59 55.30 112 14 16.44	90 01 03 269 59 39	Mon. 324 Mon. 326	2, 173. 1 3, 010. 8	Mon. 357	48 59 50.26 111 14 14.20	89 51 44 269 50 06	Mon. 356 Mon. 358	2, 952. 1 2, 616. 8
Mon. 326	48 59 55. 28 112 11 48. 32	90 01 31 269 59 33	Mon. 325 Mon. 327	3, 010. 8	Mon. 358	48 59 50.49 111 12 05.47	89 51 43 269 47 01	Mon. 357 Mon. 359	2, 616. 8 1, 583. 7
Mon. 327		90 01 16 269 59 17	Mon. 326 Mon. 328	2, 781. 6 2, 210. 5	Mon. 359	48 59 50.67 111 10 47.56	89 48 00 269 45 24	Mon. 358 Mon. 360	1, 583. 7 2, 244. 5
Mon. 328	48 59 55.27 112 07 42.73	90 00 39 269 59 38	Mon. 327 Mon. 329	2, 210. 5	Mon. 360	48 59 50.97 111 08 57.14	89 46 47 269 45 44	Mon. 359 Mon. 361	2, 244. 5 3, 081. 5
Mon. 329		90 00 55 270 00 38	Mon. 328 Mon. 330	2, 080. 8	Mon. 361	48 59 51.35 111 06 25.55	89 47 38 269 46 31	Mon. 360 Mon. 362	3, 081. 5 1, 341. 3
Mon. 330	No. of the Control of	90 02 18 270 00 16	Mon. 329 Mon. 331	2, 698, 4	Mon. 362	48 59 51.52 111 05 19.56	89 47 21 269 44 54	Mon. 361 Mon. 363	-8
Mon. 331		90 02 06 270 21 59	Mon. 330 Mon. 332	2, 962, 0	Mon. 363	48 59 51.97 111 02 31.27	89 47 01 269 45 02	Mon. 362 Mon. 364	3, 420. 7 2, 428. 0
Mon. 332		90 23 16 270 21 33	Mon. 331 Mon. 333	2, 068. 8	Mon. 364	48 59 52.30 111 00 31.81	89 46 32 269 44 47	Mon. 363 Mon. 365	
Mon. 333	48 59 54.36 111 58 06.89	90 22 43 270 21 15	Mon. 332 Mon. 334	1, 894. 9	Mon. 365	48 59 52.63 110 58 29.84	89 46 19 269 44 39	Mon. 364 Mon. 366	2, 479. 2 2, 134. 8
Mon. 334	48 59 54.20 111 57 28.28	90 21 44 270 19 55	Mon. 333 Mon. 335		Mon. 366	48 59 52.93 110 56 44.81	89 45 58 269 50 35	Mon. 365 Mon. 367	
Mon. 335		90 20 33 270 19 51	Mon. 334 Mon. 336		Mon. 367	48 59 53.06 110 55 27.16	89 51 34 269 50 07	Mon. 366 Mon. 368	1, 578. 4 3, 284. 5
Mon. 336		90 21 13 270 20 34	Mon. 335 Mon. 337	2, 210, 2	Mon. 368	48 59 53.34 110 52 45.58	89 52 09 269 37 39	Mon. 367 Mon. 369	2 22
Mon. 337		90 21 28 270 24 56	Mon. 336 Mon. 338		Mon. 369	48 59 53.72 110 51 12.86	89 38 49 269 37 18	Mon. 368 Mon. 370	1, 884. 8 2, 062. 8
Mon. 338	48 59 52.84 111 52 05.84	90 26 05 270 24 31	Mon. 337 Mon. 339	99000011000	Mon. 370	The second second	89 38 35 269 44 02	Mon. 369 Mon. 371	
Mon. 339		90 26 10 270 22 34	Mon. 338 Mon. 340	2, 678, 2	Mon. 371		89 45 57 269 44 24	Mon. 370 Mon. 372	3, 093. 4
Mon. 340	48 59 51.80 111 48 23.08	90 23 43 270 22 07	Mon. 339 Mon. 341	1, 849. 9 2, 778. 4	Mon. 372	48 59 54.95 110 44 49.57	89 46 02 269 51 54	Mon. 371 Mon. 373	2, 634. 8 2, 261. 9
Mon. 341	48 59 51, 20 111 46 06, 40	90 23 50 270 22 11	Mon. 340 Mon. 342	2, 778. 4 2, 178. 1	Mon. 373	48 59 55.11 110 42 58.30	89 53 18 269 51 57	Mon. 372 Mon. 374	2, 261. 9 2, 420. 6
Mon. 342	48 59 50.73 111 44 19.25	90 23 32 270 22 06	Mon. 341 Mon. 343	2, 178. 1 2, 722. 8	Mon. 374	48 59 55. 28 110 40 59. 21	89 53 27 269 52 08	Mon. 373 Mon. 375	2, 420. 6 2, 594. 1
Mon. 343	48 59 50.14 111 42 05.30	90 23 47 270 22 07	Mon. 342 Mon. 344	2, 722, 8 2, 392. 0	Mon. 375	48 59 55.45 110 38 51.59	89 53 44 269 52 11	Mon. 374 Mon. 376	2, 594. 1 2, 146. 2
Mon. 344	48 59 49.63 111 40 07.62	90 23 36 270 22 01	Mon. 343 Mon. 345	2, 392. 0 2, 428. 6	Mon. 376	48 59 55.60 110 37 06.00	89 53 31 269 51 48	Mon. 375 Mon. 377	2, 146. 2 2, 750. 0
Mon. 345	48 59 49.11 111 38 08.15	90 23 31 270 24 43	Mon. 344 Mon. 346	2, 428. 6 2, 402. 5	Mon. 377	48 59 55.79 110 34 50.71	89 53 30 269 52 20	Mon. 376 Mon. 378	2, 750. 0 1, 695. 1
Mon. 346	48 59 48.53 111 36 09.96	90 26 12 270 24 48	Mon. 345 Mon. 347	2, 402. 5 2, 042. 1	Mon. 378	48 59 55. 90 110 33 27. 32	89 53 23 269 52 03	Mon. 377 Mon. 379	1, 695. 1 3, 235. 6
Monk 347	48 59 48 04 111 34 29, 50	90 26 04 269 50 42	Mon. 346 Mon. 348	2, 042. 1 2, 042. 1 2, 158. 3	Mon. 379	48 59 56.11 110 30 48.14	89 54 03 269 52 24	Mon. 378 Mon. 380	3, 235. 6 1, 611. 1
Mon. 348	48 59 48. 22 111 32 43. 32	89 52 02 269 49 51	Mon. 347 Mon. 349	2, 158. 3 1, 841. 2	Mon, 380	48 59 56. 22 110 29 28. 88	89 53 24 269 51 58	Mon. 379 Mon. 381	1, 611. 1 1, 611. 1 3, 236. 5

Station	Latitude and longitude	Azimuth	To station	Distance (meters)	Station	Latitude and longitude	Azimuth	To station	Distance (meters)
Mon, 381	6 , , ,, 48 59 56.43 110 26 49.66	9 53 58 269 52 27	Mon. 380 Mon. 382	3, 236. 5 1, 853. 9	Mon. 411	9 00 01.30 109 27 36.53	0 / // 89 53 17 269 52 07	Mon. 410 Mon. 412	2, 386. 1 1, 128.
Mon. 382	48 59 56.56 110 25 18.45	89 53 36 269 51 50	Mon. 381 Mon. 383	1, 853. 9 2, 958. 6	Mon. 412	49 00 01.38 109 26 41.03	89 52 49 269 51 55	Mon. 411 Mon. 413	1, 128. 1, 817.
Mon. 383	48 59 56.76 110 22 52.90	89 53 40 269 51 37	Mon. 382 Mon. 384	2, 958. 6 2, 157. 8	Mon. 413	49 00 01.51 109 25 11.62	89 53 02 270 05 19	Mon. 412 Mon. 414	1, 817. 2, 093.
Mon. 384	48 59 56, 91 110 21 09, 16	89 52 55 269 51 41	Mon. 383 Mon. 385	2, 157. 8 1, 993. 6	Mon. 414	49 00 01.40 109 23 28.63	90 06 37 270 05 20	Mon. 413 Mon. 415	2, 093. 1, 947.
Mon. 385	48 59 57.06 110 19 31.08	89 52 55 269 51 01	Mon. 384 Mon. 386	1, 993. 6 2, 896. 4	Mon. 415	49 00 01.29 109 21 52.83	90 06 32 270 13 10	Mon. 414 Mon. 416	1, 947. 2, 407.
Mon. 386	48 59 57.28 110 17 08.59	89 52 49 269 51 18	Mon. 385 Mon. 387	2, 896. 4 2, 096. 7	Mon. 416	49 00 00.97 109 19 54.37	90 14 39 270 13 07	Mon. 415 Mon. 417	2, 407. 2, 227.
Mon. 387	48 59 57.44 110 15 25.44	89 52 36 269 51 52	Mon. 386 Mon. 388		Mon. 417	49 00 00.68 109 18 04.80	90 14 30 270 13 14	Mon. 416 Mon. 418	2, 227. 1, 735.
Mon. 388	48 59 57.59 110 13 36.21	89 53 14 269 51 41	Mon. 387 Mon. 388-A	2, 220. 3	Mon. 418	49 00 00.46 109 16 39.40	90 14 18 270 09 49	Mon. 417 Mon. 419	1, 735. 2, 672.
Mon. 388-A	48 59 57.65 110 12 56.31	89 52 11 269 52 11	Mon. 388 Mon. 388-B	810. 9 97. 8	Mon. 419	49 00 00, 19 109 14 27, 92	90 11 28 270 10 26	Mon. 418 Mon. 420	2, 672. 2, 241.
Mon. 388-B	48 59 57.66 110 12 51.50	89 52 15 269 52 15	Mon. 388-A Mon. 389	97. 8 1, 710. 4	Mon. 420	48 59 59.95 109 12 37.66	90 11 49 270 10 41	Mon. 419 Mon. 421	2, 241. 1, 402.
Mon. 389	48 59 57.78 110 11 27.35	89 53 18 269 52 52	Mon. 388-B Mon. 390	1, 710. 4 3, 145. 7	Mon. 421	48 59 59.81 109 11 28.65	90 11 33 270 10 37	Mon. 420 Mon. 422	1, 402. 1, 737.
Mon. 390	48 59 57.96 110 08 52.59	89 54 49 269 52 33	Mon. 389 Mon. 391	3, 145. 7 2, 870. 9	Mon. 422	48 59 59.62 109 10 03.15	90 11 42 270 09 58	Mon. 421 Mon. 423	1, 737. 2, 721.
Mon. 391	48 59 58.14 110 06 31.35	89 54 20 269 52 28	Mon. 390 Mon. 392	2, 870. 9 2, 165. 5	Mon. 423	48 59 59.35 109 07 49.26	90 11 39 270 10 03	Mon. 422 Mon. 424	2, 721. 2, 852.
Mon. 392	48 59 58, 28 110 04 44, 82	89 53 48 269 52 20	Mon. 391 Mon. 393	2, 165. 5 2, 654. 8	Mon. 424	48 59 59.05 109 05 28.92	90 11 49 270 09 21	Mon. 423 Mon. 425	2, 852.
Mon. 393	48 59 58.45 110 02 34.21	89 53 59 269 54 06	Mon. 392 Mon. 394	2, 654. 8 3, 126. 3	Mon. 425	48 59 58, 80 109 03 17, 85	90 11 00 270 09 43	Mon. 424 Mon. 426	2, 664.
Mon. 394		89 56 02 269 54 30	Mon. 393 Mon. 395	3, 126. 3	Mon. 426	48 59 58.63 109 01 52,87	90 10 47 270 09 50	Mon. 425 Mon. 427	1, 727. 2, 539.
Mon. 395	48 59 58.67 109 58 37.03	89 55 33 269 50 50	Mon. 394 Mon. 396	1, 694. 7 2, 523. 7	Mon. 427	48 59 58.38 108 59 47.92	90 11 25 270 09 45	Mon. 426 Mon. 428	2, 539. 2, 612.
Mon. 396	48 59 58.87 109 56 32.87	89 52 24 269 50 44	Mon. 395 Mon. 397	2, 523. 7 2, 296. 0	Mon. 428	48 59 58.12 108 57 39,38	90 11 22 270 09 12	Mon. 427 Mon. 429	2, 612. 2, 263.
Mon. 397	48 59 59.06 109 54 39.91	89 52 09 269 52 49	Mon. 396 Mon. 398	2, 296. 0 2, 046. 4	Mon, 429	48 59 57.91 108 55 48.04	90 10 36 270 09 18	Mon. 428 Mon. 430	2, 263. 1, 990.
Mon. 398	48 59 59.18 109 52 59.24	89 54 05 269 52 44	Mon. 397 Mon. 399	2, 046. 4 2, 782. 1	Mon. 430	48 59 57.72 108 54 10.12	90 10 32 270 09 27	Mon. 429 Mon. 431	1, 990. 2, 459.
Mon. 399		89 54 28 269 53 12	Mon. 398 Mon. 400	2, 782. 1	Mon. 431	48 59 57.48 108 52 09.13	90 10 58 270 09 39	Mon. 430 Mon. 432	2, 459. 2, 518.
Mon. 400	48 59 59.50 109 48 27.38	89 54 54 269 53 15	Mon. 399 Mon. 401	2, 743. 7	Mon. 432	48 59 57, 24 108 50 05, 23	90 11 12 269 56 42	Mon. 431 Mon. 433	2, 518. 1, 870.
Mon. 401	48 59 59.62 109 46 45.44	89 54 32 269 53 06	Mon. 400 Mon. 402	2, 072. 1	Mon. 433	48 59 57, 29 108 48 33, 19	89 57 51 269 56 57	Mon. 432 Mon. 434	1, 870. 1, 917.
Mon. 402	48 59 59.73 109 45 19.48	89 54 11 269 52 25	Mon. 401 Mon. 403	1,747.1 3,076.1	Mon. 434	48 59 57.33 108 46 58,84	89 58 08 269 55 12	Mon. 433 Mon. 435	1, 917. 1, 932.
Mon. 403	48 59 59.92 109 42 48.15	89 54 20 269 51 05	Mon. 402 Mon. 404	3, 076. 1 2, 928. 5	Mon, 435	48 59 57.41 108 45 23.77	89 56 24 269 55 23	Mon. 434 Mon. 436	1, 932. 2, 199.
Mon. 404	49 00 00.14 109 40 24.07	89 52 54 269 50 58	Mon. 403 Mon. 405	2, 928. 5 1, 858. 9	Mon. 436	48 59 57.49 108 43 35.56	89 56 45 269 55 17	Mon. 435 Mon. 437	2, 199. 2, 672.
Mon. 405	49 00 00.29 109 38 52.61	89 52 07 269 50 36	Mon. 404 Mon. 406	1, 858. 9 1, 889. 0	Mon. 437	48 59 57, 59 108 41 24, 09	89 56 56 269 55 05	Mon. 436 Mon. 438	2, 672. 2, 128.
Mon. 406	49 00 00.44 109 37 19.68	89 51 46 269 51 56	Mon. 405 Mon. 407	1, 889. 0 3, 053. 4	Mon. 438	48 59 57, 67 108 39 39, 38	89 56 24 269 54 55	Mon. 437 Mon. 439	2, 128. 2, 662.
Mon. 407	49 00 00.65 109 34 49.46	89 53 49 269 50 53	Mon. 406 Mon. 408	3, 053. 4 2, 444. 8	Mon. 439	48 59 57.78 108 37 28.41	89 56 34 269 55 57	Mon. 438 Mon. 440	2, 662. 2, 045.
Mon. 408	49 00 00.84 109 32 49.17	89 52 24 269 50 57	Mon. 407 Mon. 409	2, 444. 8 2, 299. 2	Mon. 440	48 59 57, 85 108 35 47, 80	89 57 13 269 55 52	Mon. 439 Mon. 441	2, 045. 3, 025.
Mon. 409	49 00 01.02 109 30 56.06	89 52 23 269 52 05	Mon. 408 Mon. 410	2, 299. 2 1, 669. 5	Mon. 441	48 59 57.94 108 33 18.95	89 57 44 269 56 08	Mon. 440 Mon. 442	3, 025. 2, 354.
Mon. 410		89 53 07 269 51 49	Mon. 409 Mon. 411	1, 669. 5 2, 386. 2	Mon. 442	48 59 58.01 108 31 23.14	89 57 35 269 56 09	Mon. 441 Mon. 443	2, 354.

Station	Latitude and longitude	Azimuth	To station	Distance (meters)	Station	Latitude and longitude	Azimuth	To station	Distance (meters)
Mon. 443	6 / // 48 59 58.06 108 30 08.25	0 / // 89 57 05 269 56 05	Mon, 442 Mon, 444	1, 522, 2 2, 085, 7	Mon. 475	0 ' '' 48 59 57.97 107 29 39.63	0 / // 90 06 23 270 05 21	Mon. 474 Mon. 476	2, 330. 4 2, 002. 7
Mon. 444	48 59 58.12 108 28 25.64	89 57 23 270 00 03	Mon. 443 Mon. 445	2, 085. 7 2, 351. 5	Mon. 476	48 59 57.85 107 28 01.10	90 06 35 270 05 33	Mon. 475 Mon. 477	2, 002. 7 1, 904. 8
Mon. 445	48 59 58.10 108 26 29.95	90 01 31 270 00 37	Mon. 444 Mon. 446	2, 351. 5 1, 346. 2	Mon. 477	48 59 57.74 107 26 27.39	90 06 44 270 05 35	Mon. 476 Mon. 478	1, 904. 8 1, 904. 0
Mon. 446	48 59 58.09 108 25 23.72	90 01 27 269 53 57	Mon. 445 Mon. 447	1, 346. 2 2, 655. 6	Mon. 478	48 59 57.63 107 24 53.72	90 06 46 268 47 24	Mon. 477 Mon. 479	1, 904. 0 1, 956. 8
Mon. 447	48 59 58.22 108 23 13.07	89 55 36 269 53 51	Mon. 446 Mon. 448	2, 655. 6 2, 618. 4	Mon. 479	48 59 58.96 107 23 17.47	88 48 37 268 47 42	Mon. 478 Mon. 480	1, 956. 8 1, 997. 8
Mon. 448	48 59 58.35 108 21 04.26	89 55 29 269 53 49	Mon. 447 Mon. 449	2, 618. 4 2, 697. 3	Mon. 480	49 00 00.31 107 21 39.22	88 48 56 270 01 19	Mon. 479 Mon. 481	1, 997. 8 2, 872. 2
Mon. 449	48 59 58.49 108 18 51.55	89 55 29 269 55 59	Mon. 448 Mon. 450	2, 697. 3 2, 455. 2	Mon. 481	49 00 00.25 107 19 17.91	90 03 06 270 01 06	Mon. 480 Mon. 482	2, 872. 2 2, 709. 3
Mon. 450	48 59 58.56 108 16 50.76	89 57 30 269 55 45	Mon. 449 Mon. 451	2, 455. 2 3, 231. 4	Mon. 482	49 00 00.20 107 17 04.62	90 02 47 269 59 13	Mon. 481 Mon. 483	2, 709. 8 2, 308. 8
Mon. 451	48 59 58.66 108 14 11.79	89 57 45 269 58 13	Mon. 450 Mon. 452	3, 231. 4 2, 399. 3	Mon. 483	49 00 00.20 107 15 11.03	90 00 39 269 58 03	Mon. 482 Mon. 484	2, 308. 8 2, 448. 3
Mon. 452	48 59 58 69 108 12 13 75	89 59 42 269 58 10	Mon. 451 Mon. 453	2, 399. 3 2, 033. 9	Mon. 484	49 00 00.23 107 13 10.58	89 59 34 270 00 24	Mon. 483 Mon. 485	2, 448. 3 3, 272. 6
Mon. 453	48 59 58.71 108 10 33.69	89 59 26 269 58 03	Mon. 452 Mon. 454	2, 033. 9 2, 512. 9	Mon. 485	49 00 00.18 107 10 29.57	90 02 26 270 00 43	Mon. 484 Mon. 486	3, 272. 6 2, 217. 2
Mon. 454	48 59 58.74 108 08 30.06	89 59 36 269 57 41	Mon. 453 Mon. 455	2, 512, 9 2, 341, 6	Mon. 486	49 00 00.15 107 08 40.49	90 02 05 270 01 11	Mon. 485 Mon. 487	2, 217. 2 2, 282. 7
Mon. 455	48 59 58.77 108 06 34.86	89 59 08 269 57 07	Mon. 454 Mon. 456	2, 341. 6 2, 438. 8	Mon. 487	49 00 00.11 107 06 48.19	90 02 36 270 00 27	Mon. 486 Mon. 488	2, 282. 7 3, 492. 7
Mon. 456	48 59 58.82 108 04 34.87	89 58 38 269 56 59	Mon. 455 Mon. 457	2, 438, 8 2, 362, 2	Mon. 488	49 00 00.06 107 03 56.35	90 02 37 270 00 15	Mon. 487 Mon. 489	3, 492. 7 2, 849. 6
Mon. 457	48 59 58.87 108 02 38.66	89 58 27 269 56 59	Mon. 456 Mon. 458	2, 362. 2 2, 460. 1	Mon. 489	49 00 00.03 107 01 36,16	90 02 01 270 00 06	Mon. 488 Mon. 490	2, 849. 6 3, 043. 0
Mon. 458	48 59 58.92 108 00 37.63	89 58 30 269 56 56	Mon. 457 Mon. 459	2, 460. 1 2, 371. 5	Mon. 490	49 00 00.00 106 59 06.45	90 01 59 270 00 30	Mon. 489 Mon. 491	3, 043. 0 2, 404. 8
Mon. 459	48 59 58.98 107 58 40.96	89 58 24 269 57 23	Mon. 458 Mon. 460	2, 371. 5 2, 165. 3	Mon. 491	48 59 59.97 106 57 08.14	90 01 59 270 00 13	Mon. 490 Mon. 492	2, 404. 8 2, 735. 3
Mon. 460	48 59 59.02 107 56 54.43	89 58 43 269 57 15	Mon. 459 Mon. 461	2, 165, 3 2, 664, 8	Mon. 492	48 59 59.95 106 54 53.57	90 01 54 270 01 22	Mon. 491 Mon. 493	2, 735. 3 2, 274. 7
Mon. 461	48 59 59.06 107 54 43.32	89 58 54 269 57 51	Mon, 460 Mon, 462	2, 664. 8 1, 944. 9	Mon, 493	48 59 59.90 106 53 01.66	90 02 46 270 01 47	Mon. 492 Mon. 494	2, 274. 7 2, 082. 0
Mon. 462	48 59 59.09 107 53 07.64	89 59 03 269 57 28	Mon. 461 Mon. 463	1, 944. 9 2, 889. 9	Mon. 494	48 59 59.86 106 51 19.23	90 03 04 269 59 46	Mon. 493 Mon. 495	2, 082. 0 2, 658. 0
Mon. 463	48 59 59.14 107 50 45.46	89 59 15 269 57 36	Mon. 462 Mon. 464	2, 889. 9 1, 941. 2	Mon. 495	48 59 59.84 106 49 08.46	90 01 25 269 59 45	Mon. 494 Mon. 496	2, 658. 6 1, 856. 6
Mon. 464	48 59 59.17 107 49 09.96	89 58 48 269 57 42	Mon. 463 Mon. 465	1, 941. 2 2, 888. 2	Mon. 496	48 59 59.84 106 47 37.12	90 00 54 270 05 13	Mon. 495 Mon. 497	1, 856. 6 2, 609. 6
Mon. 465		89 59 29 270 06 01	Mon. 464 Mon. 466	2, 888. 2 1, 511. 8	Mon. 497	48 59 59.69 106 45 28.74	90 06 50 270 05 35	Mon. 496 Mon. 498	2, 609. 6 2, 092. 9
Mon. 466	48 59 59.12 107 45 33.49	90 06 57 270 05 41	Mon. 465 Mon. 467	1, 511. 8 2, 020. 7	Mon. 498	48 59 59.56 106 43 45.77	90 06 53 270 05 20	Mon. 497 Mon. 499	2, 092. 9 1, 920. 1
Mon. 467	48 59 59.00 107 43 54.08	90 06 56 270 07 04	Mon. 466 Mon. 468	2, 020. 7 1, 095. 4	Mon. 499	48 59 59.46 106 42 11.30	90 06 31 270 00 24	Mon. 498 Mon. 500	1, 920. 1 2, 323. 2
Mon. 468	48 59 58.92 107 43 00.19	90 07 45 270 07 02	Mon. 467 Mon. 469	1, 095. 4 2, 089. 7	Mon. 500	48 59 59.43 106 40 16.99	90 01 50 269 59 41	Mon. 499 Mon. 501	2, 323. 8 1, 870. 2
Mon. 469	48 59 58.77 107 41 17.38	90 08 19 270 05 58	Mon. 468 Mon. 470	2, 089. 7 2, 261. 8	Mon. 501	48 59 59.43 106 38 44.98	90 00 50 269 59 19	Mon. 500 Mon. 502	1, 870. 2 2, 728. 3
Mon. 470	48 59 58.63 107 39 26.10	90 07 22 270 04 56	Mon. 469 Mon. 471	2, 261. 8 2, 257. 8	Mon. 502	48 59 59.42 106 36 30.76	90 01 01 270 11 13	Mon. 501 Mon. 503	2, 728. 3 2, 569. 4
Mon. 471	48 59 58.51 107 37 35.02	90 06 20 270 05 56	Mon. 470 Mon. 472	2, 257. 8 2, 248. 7	Mon. 503	48 59 59.13 106 34 24.35	90 12 48 270 11 39	Mon. 502 Mon. 504	2, 569. 4 2, 291. 9
Mon. 472	48 59 58.37 107 35 44.39	90 07 19 270 04 51	Mon. 471 Mon. 473	2, 248. 7 2, 828. 7	Mon. 504	48 59 58.87 106 32 31.60	90 13 04 270 12 36	Mon. 503 Mon. 505	2, 291. 9 1, 797. 0
Mon. 473	48 59 58.22 107 33 25.23	90 06 36 270 05 11	Mon. 472 Mon. 474	2, 828. 7 2, 255. 3	Mon. 505	48 59 58.64 106 31 03.19	90 13 43 270 02 52	Mon. 504 Mon. 506	1, 797. 0 2, 508. 4
Mon. 474	48 59 58.09 107 31 34.28	90 06 35 270 04 56	Mon. 473 Mon. 475	2, 255. 3 2, 330. 4	Mon. 506	48 59 58, 56 106 28 59, 79	90 04 25 270 03 10	Mon. 505 Mon. 507	2, 508. 4 2, 857. 1

Station	Latitude and longitude	Azimuth	To station	Distance (meters)	Station	Latitude and longitude	Azimuth	To station	Distance (meters)
Mon. 507	6 / // 48 59 58.45 106 26 39.22	90 04 56 270 03 00	Mon. 506 Mon. 508	2, 857. 1 2, 645. 6	Mon. 539	0 / // 48 59 58 18 105 24 07, 06	90 05 53 270 04 33	Mon. 538 Mon. 540	2, 284. 8 2, 551. 5
Mon. 508	48 59 58.35 106 24 29.07	90 04 38 270 05 18	Mon. 507 Mon. 509	2, 645. 6 3, 378. 3	Mon. 540	48 59 58.05 105 22 01.54	90 06 08 270 04 48	Mon. 539 Mon. 541	2, 551. 5 2, 575. 3
Mon. 509	48 59 58.15 106 21 42.86	90 07 24 270 04 18	Mon. 508 Mon. 510	3, 378. 3 2, 830. 2	Mon. 541	48 59 57.91 105 19 54.84	90 06 24 270 04 08	Mon. 540 Mon. 542	2, 575. 3 2, 535. 4
Mon. 510	48 59 58.02 106 19 23.63	90 06 03 270 06 22	Mon. 509 Mon. 511	2, 830. 2 1, 810. 7	Mon. 542	48 59 57.80 105 17 50.11	90 05 42 270 05 07	Mon. 541 Mon. 543	2, 535, 4 2, 405, 9
Mon. 511	48 59 57.90 106 17 54.55	90 07 29 270 04 50	Mon. 510 Mon. 512	1, 810. 7 1, 900. 3	Mon. 543	48 59 57.66 105 15 51,74	90 06 37 270 04 49	Mon. 542 Mon. 544	2, 405. 9 2, 475. 3
Mon. 512	48 59 57.80 106 16 21.06	90 06 01 270 04 51	Mon. 511 Mon. 513	1, 900. 3 3, 196. 1	Mon. 544	48 59 57.53 105 13 49.97	90 06 21 270 04 09	Mon. 543 Mon. 545	2, 475. 3 497. 7
Mon. 513	48 59 57.62 106 13 43.82	90 06 49 269 54 39	Mon. 512 Mon. 514	3, 196. 1 1, 966. 9	Mon. 545	48 59 57.51 105 13 25.48	90 04 28 270 03 44	Mon. 544 Mon. 546	497. 7 2, 934. 8
Mon. 514	48 59 57.71 106 12 07.05	89 55 52 269 55 04	Mon. 513 Mon. 515	1, 966. 9 1, 958. 0	Mon. 546	48 59 57.38 105 11 01.10	90 05 33 270 03 42	Mon. 545 Mon. 547	1
Mon. 515	48 59 57.79 106 10 30.72	89 56 17 269 54 02	Mon. 514 Mon. 516	1, 958. 0 2, 551. 6	Mon. 547	48 59 57.27 105 08 48.54	90 05 22 270 01 22	Mon. 546 Mon. 548	2, 694.
Mon. 516	48 59 57.92 106 08 25.19	89 55 37 269 54 11	Mon. 515 Mon. 517	2, 551. 6 2, 592. 0	Mon. 548		90 02 38 270 01 33	Mon. 547 Mon. 549	
Mon. 517	48 59 58.04 106 06 17.68	89 55 47 269 55 04	Mon. 516 Mon. 518	2, 592. 0 2, 345. 8	Mon. 549	48 59 57.16 105 04 45.49	90 03 21 270 02 06	Mon. 548 Mon. 550	2, 902. 4
Mon. 518	48 59 58.13 106 04 22.27	89 56 31 269 54 57	Mon. 517 Mon. 519		Mon. 550	48 59 57.11 105 03 02.83	90 03 23 270 01 04	Mon. 549 Mon. 551	
Mon. 519	48 59 58.22 106 02 34.59	89 56 18 269 54 41	Mon. 518 Mon. 520	2, 188. 7	Mon. 551	48 59 57.07 105 01 08.08	90 02 31 270 01 20	Mon. 550 Mon. 552	2, 332.
Mon. 520	48 59 58.32 106 00 38.84	89 56 08 269 54 07	Mon. 519 Mon. 521	2, 352, 8	Mon. 552	48 59 57.04 104 59 41.70	90 02 25 270 02 53	Mon. 551 Mon. 553	
Mon. 521	48 59 58.44 105 58 36.56	89 55 39 269 54 55	Mon. 520 Mon. 522	2, 485. 4	Mon. 553	48 59 56.94 104 57 27,22	90 04 34 270 02 57	Mon. 552 Mon. 554	2, 733.
Mon. 522	48 59 58.54 105 56 40.73	89 56 23 269 54 51	Mon. 521 Mon. 523		Mon. 554	48 59 56.83 104 54 52.51	90 04 54 270 02 36	Mon. 553	lo Milano
Mon. 523	48 59 58.64 105 54 38.81	89 56 23 269 54 26	Mon. 522 Mon. 524	2, 478. 2	Mon. 555	48 59 56.73 104 52 28.81	90 04 25 270 02 07	Mon. 554 Mon. 556	2, 920.
Mon. 524	48 59 58.76 105 52 37.16	89 55 58 269 54 43	Mon. 523 Mon. 525	2, 472. 8	Mon. 556	48 59 56, 66 104 50 16, 00	90 03 47 270 01 56	Mon. 555 Mon. 557	
Mon. 525	48 59 58.86 105 50 39.68	89 56 11 269 55 05	Mon. 524 Mon. 526	2, 387. 8	Mon. 557	48 59 56.60 104 48 16.60	90 03 26 270 02 32	Mon. 556 Mon. 558	
Mon. 526	48 59 58.94 105 48 50.46	89 56 27 269 54 42	Mon. 525 Mon. 527	2, 220. 0	Mon. 558	48 59 56.50 104 45 48.45	90 04 24 270 03 10	Mon. 557 Mon. 559	4 10
Mon. 527	48 59 59.06 105 46 42,95	89 56 18 269 54 01	Mon. 526 Mon. 528	2, 591. 9	Mon. 559	48 59 56.46 104 44 53.09	90 03 52 270 02 17	Mon. 558 Mon. 560	
Mon. 528	48 59 59.17 105 44 44.76	89 55 30 269 54 43	Mon. 527 Mon. 529		Mon. 560		90 03 29 270 01 59	Mon. 559 Mon. 561	
Mon. 529		89 56 14 270 03 50	Mon. 528 Mon. 530		Mon. 561		90 03 41 269 50 46	Mon. 560 Mon. 562	
Mon. 530	48 59 59.18 105 40 55.87	90 05 12 270 04 29	Mon. 529 Mon. 531	2, 218. 7 2, 558. 1	Mon. 562	48 59 56.52 104 39 08.31	89 52 14 269 50 17	Mon. 561 Mon. 563	2, 356. 4 1, 694. 0
Mon. 531	48 59 59.06 105 38 50.02	90 06 04 270 04 33	Mon. 530 Mon. 532	2, 558. 1 2, 820. 6	Mon. 563	48 59 56.67 104 37 44.97	89 51 20 269 50 37	Mon. 562 Mon. 564	1, 694. 2, 341.
Mon. 532	48 59 58.91 105 36 31.25	90 06 18 270 06 07	Mon. 531 Mon. 533	2, 820. 6 1, 775. 6	Mon. 564	48 59 56.86 104 35 49.79	89 52 04 269 50 22	Mon. 563 Mon. 565	2, 341. 2 2, 251. 3
Mon. 533	48 59 58.80 105 35 03.90	90 07 13 270 04 26	Mon. 532 Mon. 534	1, 775. 6 1, 767. 8	Mon. 565	48 59 57. 05 104 33 59. 04	89 51 45 269 51 06	Mon. 564	2, 251. 1 1, 668.
Mon. 534	48 59 58.72 105 33 36.92	90 05 31 270 03 54	Mon. 533 Mon. 535	1, 767. 8 3, 104. 1	Mon. 566	48 59 57. 18 104 32 36. 96	89 52 08 269 50 15	Mon. 565 Mon. 567	1, 668. 3, 082.
Mon. 535	48 59 58.58 105 31 04.21	90 05 49 270 04 28	Mon. 534 Mon. 536	3, 104. 1 2, 226. 0	Mon. 567	48 59 57. 44 104 30 05. 30	89 52 09 269 51 22	Mon. 566 Mon. 568	3, 082. 1 1, 648. 3
Mon. 536	48 59 58.47 105 29 14.69	90 05 51 270 04 21	Mon. 535 Mon. 537	2, 226. 0 1, 830. 1	Mon. 568	48 59 57. 56 104 28 44. 21	89 52 23 269 50 30	Mon. 567 Mon. 569	1, 648. 3 1, 830. 9
Mon. 537	48 59 58.38 105 27 44.66	90 05 29 270 04 04	Mon. 536 Mon. 538	1, 830. 1 2, 138. 1	Mon. 569	48 59 57.72 104 27 14.13	89 51 38 269 50 53	Mon. 568 Mon. 570	1, 830. 9 2, 048. 7
Mon. 538	48 59 58.29 105 25 59.47	90 05 23 270 04 28	Mon. 537 Mon. 539	2, 138. 1 2, 138. 1 2, 284. 8	Mon. 570	48 59 57. 88 104 25 33. 34	89 52 09 269 50 02	Mon. 569 Mon. 571	2, 048. 7 2, 048. 7 2, 318. 9

Station	Latitude and longitude	Azimuth	To station	Distance (meters)	Station	Latitude and longitude	Azimuth	To station	Distance (meters)
Mon. 571	6 , , ,, 48 59 58 08 104 23 39 25	89 51 28 269 50 21	Mon. 570 Mon. 572	2, 318. 9 2, 106. 0	Mon, 603	0 / // 48 59 57, 48 103 24 54, 56	° ' '' 89 58 46 269 57 22	Mon. 602 Mon. 604	2, 748. 8 2, 542. 8
Mon. 572	48 59 58, 26 104 21 55, 64	89 51 39 269 50 14	Mon. 571 Mon. 573	2, 106. 0 2, 489. 6	Mon. 604	48 59 57.52 103 22 49.48	89 58 56 269 57 21	Mon. 603 Mon. 605	2, 542, 4 2, 219, 6
Mon. 573	48 59 58,47 104 19 53,16	89 51 47 269 50 13	Mon. 572 Mon. 574	2, 489. 6 2, 889. 7	Mon. 605	48 59 57. 56 103 21 00. 28	85 58 43 269 57 32	Mon. 604 Mon. 606	2, 219. 6 2, 631. 9
Mon. 574	48 59 58.71 104 17 31.00	89 52 00 269 50 49	Mon. 573 Mon. 575	2, 889. 7 1, 534. 2	Mon. 606	48 59 57, 60 103 18 50, 80	89 59 10 269 57 16	Mon. 605 Mon. 607	2, 631. 5 2, 244.
Mon. 575	48 59 58.84 104 16 15.52	89 51 46 269 50 29	Mon. 574 Mon. 576	1, 534. 2 1, 833. 7	Mon. 607	48 59 57.64 103 17 00.36	89 58 39 269 57 40	Mon. 606 Mon. 608	2, 244. 1, 739.
Mon. 576	48 59 58.99 104 14 45.30	89 51 37 269 50 03	Mon. 575 Mon. 577	1, 833. 7 1, 703. 1	Mon. 608	48 59 57, 68 103 15 34, 79	89 58 45 269 56 44	Mon. 607 Mon. 609	1, 739. 2, 241.
Mon. 577	48 59 59.14 104 13 21.52	89 51 06 269 50 37	Mon. 576 Mon. 578	1, 703. 1 2, 054. 9	Mon. 609	48 59 57.73 103 13 44.53	89 58 07 269 57 03	Mon. 608 Mon. 610	2, 241. 1, 924.
Mon. 578	48 59 59.31 104 11 40.42	89 51 53 269 50 27	Mon. 577 Mon. 579	2, 054. 9 1, 780. 8	Mon. 610	48 59 57.77 103 12 09.83	89 58 15 270 03 15	Mon. 609 Mon. 611	1, 924. 2, 836.
Mon. 579	48 59 59.46 104 10 12.81	89 51 33 269 49 27	Mon. 578 Mon. 580	1,780.8 2,442.8	Mon. 611	48 59 57.66 103 09 50.28	90 05 00 270 03 17	Mon. 610 Mon. 612	2, 836. 2, 461.
Mon. 580	48 59 59.69 104 08 12.63	89 50 57 269 49 43	Mon. 579 Mon. 581	2, 442. 8 1, 886. 4	Mon. 612	48 59 57.57 103 07 49.18	90 04 48 269 59 32	Mon. 611 Mon. 613	2, 461. 2, 656.
Mon. 581		89 50 53 270 06 41	Mon. 580 Mon. 582	1, 886. 4 2, 962. 7	Mon. 613	48 59 57.56 103 05 38.50	90 01 11 269 59 27	Mon. 612 Mon. 614	2, 656. 3, 066.
Mon, 582	48 59 59.65 104 04 14.07	90 08 31 270 07 27	Mon. 581 Mon. 583	2, 962. 7 1, 637. 8	Mon. 614	48 59 57.55 103 03 07,62	90 01 21 270 01 01	Mon. 613 Mon. 615	3, 066. 2, 656.
Mon. 583 6	48 59 59,53 104 02 53,49	90 08 27 270 07 19	Mon. 582 Mon. 584	1, 637. 8 2, 286. 3	Mon. 615	48 59 57.50 103 00 56.93	90 02 40 270 00 48	Mon, 614 Mon, 616	2, 656. 2, 569.
Mon. 584	48 59 59.36 104 01 01.01	90 08 44 270 07 51	Mon. 583 Mon. 585	2, 286. 3 1, 258. 9	Mon. 616	48 59 57.46 102 58 50.52	90 02 24 270 01 48	Mon. 615 Mon. 617	2, 569. 2, 507.
Mon. 585		90 08 38 270 07 28	Mon. 584 Mon. 586	1, 258. 9 1, 963. 1	Mon. 617	48 59 57.40 102 56 47.17	90 03 21 270 01 23	Mon. 616 Mon. 618	2, 507. 2, 700.
Mon. 586		90 08 41 270 06 34	Mon. 585 Mon. 587	1, 963. 1 2, 948. 8	Mon. 618	48 59 57.34 102 54 34,31	90 03 04 270 00 36	Mon. 617 Mon. 619	100
Mon. 587	NAME AND DESCRIPTION	90 08 24 270 06 19	Mon. 586 Mon. 588	2, 948. 8 2, 909. 8	Mon. 619	48 59 57.32 102 52 58.45	90 01 48 270 00 21	Mon. 618 Mon. 620	1, 948. 2, 394.
Mon. 588	48 59 58.70 103 53 34.28	90 08 07 270 06 15	Mon. 587 Mon. 589	2, 909. 8 3, 089. 0	Mon. 620	48 59 57.30 102 51 00.64	90 01 50 270 02 57	Mon. 619 Mon. 621	2, 394. 1, 627.
Mon. 589		90 08 09 270 06 14	Mon. 588 Mon. 590	3, 089. 0 2, 748. 1	Mon. 621	48 59 57. 24 102 49 40. 56	90 03 57 270 06 41	Mon. 620 Mon. 622	-
Mon. 590		90 07 56 270 06 18	Mon. 589 Mon. 591		Mon. 622	48 59 57. 10 102 47 55, 29	90 08 00 270 06 52	Mon. 621 Mon. 623	2, 139. 1, 409.
Mon. 591	48 59 58.11 103 46 20,01	90 08 09 270 06 38	Mon. 590 Mon. 592	2, 990. 0 2, 762. 2	Mon. 623	48 59 57.00 102 46 45.92	90 07 44 270 03 25	Mon. 622 Mon. 624	1, 409. 5 2, 318.
Mon. 592	48 59 57.91 103 44 04.12	90 08 21 270 06 47	Mon. 591 Mon. 593	G-Marian San	Mon. 624	48 59 56, 91 102 44 51, 84	90 04 51 270 03 16	Mon. 623 Mon. 625	
Mon. 593	48 59 57.80 103 42 42.91	90 07 48 270 07 16	Mon. 592 Mon. 594	1, 650. 8 2, 052. 0	Mon. 625		90 04 49 270 06 23	Mon. 624 Mon. 626	
Mon. 594	48 59 57.65 103 41 01.96	90 08 32 270 07 01	Mon. 593 Mon. 595	2, 052. 0 2, 102. 5	Mon. 626	48 59 56, 68 102 41 10, 16	90 07 37 270 06 30	Mon. 625 Mon. 627	1, 995. 2, 055.
Mon. 595	48 59 57.49 103 39 18.52	90 08 19 270 06 41	Mon. 594 Mon. 596	2, 102. 5 2, 014. 6	Mon. 627	48 59 56, 55 102 39 29, 05	90 07 46 270 05 25	Mon. 626 Mon. 628	2, 055. 1, 984.
Mon. 596	48 59 57.36 103 37 39.40	90 07 56 270 07 07	Mon. 595 Mon. 597	2, 014. 6 2, 107. 3	Mon. 628	48 59 56.43 102 37 51,43	90 06 39 270 05 15	Mon. 627 Mon. 629	1, 984. 2, 687.
Mon. 597	48 59 57. 20 103 35 55. 73	90 08 25 269 56 50	Mon. 596 Mon. 598	2, 107. 3 2, 343. 7	Mon. 629	48 59 56, 28 102 35 39, 23	90 06 55 270 05 33	Mon. 628 Mon. 630	2, 687. 3, 237.
Mon. 598	48 59 57. 26 103 34 00. 43	89 58 17 269 57 19	Mon. 597 Mon. 599	2, 343. 7 1, 924. 8	Mon. 630	48 59 56.08 102 32 59.96	90 07 34 270 06 19	Mon. 629 Mon. 631	3, 237. 1, 961.
Mon. 599	48 59 57. 29 103 32 25, 74	89 58 31 269 57 16	Mon. 598 Mon. 600	1, 924. 8 1, 833. 6	Mon. 631	48 59 55.95 102 31 23,44	90 07 32 270 06 16	Mon. 630 Mon. 632	1, 961. 2, 632,
Ion. 600	48 59 57.33 103 30 55.53	89 58 24 269 57 19	Mon. 599 Mon. 601	1, 833. 6 1, 719. 6	Mon. 632	48 59 55, 77 102 29 13, 94	90 07 54 270 06 34	Mon. 631 Mon. 633	2, 632. 2, 275.
Mon. 601	48 59 57.36 103 29 30.93	89 58 23 269 57 01	Mon. 600 Mon. 602	1, 719. 6 2, 868. 8	Mon. 633	48 59 55.62 102 27 21.98	90 07 59 269 58 31	Mon. 632 Mon. 634	2, 275. 9 3, 066. 2
Mon. 602	48 59 57.42 103 27 09.79	89 58 47 269 57 04	Mon. 601 Mon. 603	2, 868. 8 2, 748. 8	Mon. 634	48 59 55. 63 102 24 51, 13	90 00 25 269 58 38	Mon. 633 Mon. 635	3, 066. 2 2, 716. 2

⁶ Monument 583 marks the northeast corner of Montana and the northwest corner of North Dakota.

Station	Latitude and longitude	Azimuth	To station	Distance (meters)	Station	Latitude and longitude	Azimuth	To station	Distance (meters)
	0 / // 48 59 55.65 102 22 37.51	0 / // 90 00 19 269 58 34	Mon. 634 Mon. 636	2, 716. 2 2, 178. 2	Mon. 667	0 / // 48 59 58.02 101 27 22.52	90 00 05 269 59 11	Mon. 666 Mon. 668	1, 859. 4 1, 614. 0
Mon. 636	48 59 55.66 102 20 50.35	89 59 55 269 58 20	Mon. 635 Mon. 637	2, 178. 2 2, 413. 3	Mon. 668	48 59 58.02 101 26 03.12	90 00 11 269 58 58	Mon. 667 Mon. 669	1, 614, 0 2, 652, 2
Mon. 637	48 59 55.68 102 18 51.62	89 59 49 269 58 34	Mon. 636 Mon. 638	2, 413. 3 2, 487. 0	Mon. 669	48 59 58.02 101 23 52.64	90 00 36 269 59 11	Mon. 668 Mon. 670	2, 652. 2 2, 191. 7
Mon. 638	48 59 55.70 102 16 49.27	90 00 06 269 58 01	Mon. 637 Mon. 639		Mon. 670	48 59 58.03 101 22 04.81	90 00 32 269 58 36	Mon. 669 Mon. 671	2, 191. 7 2, 430. 0
Mon. 639	48 59 55.73 102 14 41.52	89 59 37 269 58 39	Mon. 638 Mon. 640	2, 596. 7	Mon. 671	48 59 58.04 101 20 05.26	90 00 06 269 58 49	Mon. 670 Mon. 672	2, 430. 0 2, 407. 4
Mon. 640	48 59 55.74 102 13 07.20	89 59 50 269 58 51	Mon. 639 Mon. 641	1, 917. 2 785. 5	Mon. 672	48 59 58.05 101 18 06.82	90 00 19 269 58 30	Mon. 671 Mon. 673	2, 407. 4 2, 442. 4
Mon. 641	48 59 55.75 102 12 28.55	89 59 20 269 58 38	Mon. 640 Mon. 642	785. 5 2, 024. 2	Mon. 673	48 59 58.07 101 16 06.66	90 00 01 269 58 19	Mon. 672 Mon. 674	2, 442. 4 2, 393. 0
Mon. 642	48 59 55.76 102 10 48.97	89 59 53 269 58 24	Mon. 641 Mon. 643	2, 024. 2 2, 473. 5	Mon. 674	48 59 58.09 101 14 08.93	89 59 48 269 57 41	Mon. 673 Mon. 675	2, 393. 0 2, 199. 3
Mon. 643	48 59 55.78 102 08 47.29	89 59 56 269 58 19	Mon. 642 Mon. 644	2, 473. 5	Mon. 675	48 59 58.12 101 12 20.73	89 59 03 269 57 31	Mon. 674 Mon. 676	2, 199. 3 2, 646. 0
Mon. 644	48 59 55.80 102 06 45.68	89 59 50 269 58 20	Mon. 643 Mon. 645	2, 471. 7	Mon. 676	48 59 58.17 101 10 10.56	89 59 09 269 57 46	Mon. 675 Mon 677	2, 646. 0 2, 203. 1
Mon. 645	48 59 55.82 102 04 32.35	90 00 00 269 58 19	Mon. 644 Mon. 646	2, 710. 3 2, 135. 0	Mon. 677	48 59 58. 20 101 08 22. 17	89 59 07 269 57 35	Mon. 676 Mon. 678	2, 203. 1 2, 636. 0
Mon. 646	48 59 55.85 102 02 47.31	89 59 38 269 58 05	Mon. 645 Mon. 647	2, 135. 0 2, 523. 9	Mon. 678	48 59 58.24 101 06 12.48	89 59 13 269 57 27	Mon. 677 Mon. 679	2, 636. 0 2, 540. 9
Mon. 647	48 59 55.87 102 00 43.15	89 59 39 269 58 13	Mon. 646 Mon. 648	2, 523. 9 2, 314. 2	Mon. 679	48 59 58.28 101 04 07,48	89 59 01 269 57 41	Mon. 678 Mon. 680	2, 540. 9 2, 296. 9
Mon. 648	48 59 55.89 101 58 49.30	89 59 39 269 48 53	Mon. 647 Mon. 649	2, 314. 2 1, 767. 7	Mon. 680	48 59 58.31 101 02 14.47	89 59 07 269 57 35	Mon. 679 Mon. 681	2, 296, 9 2, 385, 1
Mon. 649	48 59 56.07 101 57 22.33	89 49 59 269 49 44	Mon. 648 Mon. 650	1, 767. 7 1, 844. 6	Mon. 681	48 59 58.35 101 00 17,13	89 59 04 269 57 30	Mon. 680 Mon. 682	2, 385. 1 2, 432. 9
Mon. 650	48 59 56. 24 101 55 51. 58	89 50 52 269 50 06	Mon. 649 Mon. 651	1, 844. 6 2, 399. 7	Mon. 682	48 59 58,39 100 58 17,44	89 59 00 269 59 33	Mon. 681 Mon. 683	2, 432. 9 2, 638. 6
Mon. 651	48 59 56.45 101 53 53.53	89 51 35 269 55 37	Mon. 650 Mon. 652	2, 399. 7 3, 069. 7	Mon, 683	48 59 58.38 100 56 07.63	90 01 11 269 59 36	Mon. 682 Mon. 684	2, 638. 6 1, 733. 6
Mon. 652	48 59 56.55 101 51 22.51	89 57 31 269 56 11	Mon. 651 Mon. 653	3, 069. 7 1, 507. 9	Mon. 684	48 59 58.38 100 54 42.34	90 00 40 270 02 26	Mon. 683 Mon. 685	1, 733. 6 2, 107. 4
Mon. 653	48 59 56.60 101 50 08.32	89 57 07 269 54 10	Mon. 652 Mon. 654	1, 507. 9 1, 869. 9	Mon. 685	48 59 58.32 100 52 58.66	90 03 44 270 02 44	Mon. 684 Mon. 686	2, 107. 4 2, 137. 6
Mon. 654	48 59 56, 69 101 48 36, 33	89 55 20 269 54 14	Mon. 653 Mon. 655	1, 869. 9 1, 919. 7	Mon. 686	48 59 58.25 100 51 13.50	90 04 04 270 01 21	Mon. 685 Mon. 687	2, 137. 6 2, 697. 4
Mon. 655	48 59 56.78 101 47 01.89	89 55 26 269 53 44	Mon. 654 Mon. 656	1, 919. 7 2, 195. 4	Mon. 687	48 59 58, 20 100 49 00, 80	90 03 01 270 01 16	Mon. 686 Mon. 688	
Mon. 656	48 59 56, 90 101 45 13, 88	89 55 06 269 53 43	Mon. 655 Mon. 657	2, 195. 4 2, 092. 1	Mon. 688	48 59 58.14 100 46 47.15	90 02 57 270 01 34	Mon. 687 Mon. 689	2, 716. 6 1, 952. 8
Mon. 657	48 59 57.01 101 43 30.96	89 55 01 269 53 55	Mon. 656 Mon. 658		Mon. 689	48 59 58.10 100 45 11.08	90 02 47 270 01 42	Mon. 688 Mon. 690	1, 952. 8 1, 956. 4
Mon. 658	48 59 57.11 101 41 52.80	89 55 09 269 53 42	Mon. 657 Mon. 659		Mon. 690	48 59 58.06 100 43 34.83	90 02 55 270 01 47	Mon. 689 Mon. 691	1, 956. 4 3, 074. 4
Mon. 659	48 59 57, 21 101 40 21, 36	89 54 51 269 53 38	Mon. 658 Mon. 660		Mon. 691	48 59 57.98 100 41 03.57	90 03 41 270 01 29	Mon. 690 Mon. 692	3, 074. 4 3, 074. 5
Mon. 660	48 59 57.31 101 38 49.07	89 54 48 269 53 32	Mon. 659 Mon. 661		Mon. 692	48 59 57.91 100 38 32.32	90 03 23 270 01 17	Mon. 691 Mon. 693	3, 074. 5 2, 164. 7
Mon. 661	48 59 57.43 101 36 59.88	89 54 55 269 53 44	Mon. 660 Mon. 662		Mon. 693	48 59 57.87 100 36 45.82	90 02 37 270 01 32	Mon. 692 Mon. 694	2, 164. 7 2, 153. 2
Mon. 662	48 59 57.55 101 35 15.73	89 55 03 269 53 04	Mon. 661 Mon. 663		Mon. 694	48 59 57.83 100 34 59.89	90 02 52 270 01 33	Mon. 693 Mon. 695	2, 153. 2 1, 942. 3
Mon. 663	48 59 57.67 101 33 29.08	89 54 24 269 52 56	Mon. 662 Mon. 664		Mon. 695	48 59 57.79 100 33 24,33	90 02 45 270 01 17	Mon. 694 Mon. 696	1, 942. 3 2, 230. 1
Mon. 664	48 59 57.80 101 31 44.39	89 54 15 269 53 15	Mon. 663 Mon. 665		Mon. 696	48 59 57.75 100 31 34.62	90 02 40 270 01 40	Mon. 695 Mon. 697	2, 230. 1 1, 006. 9
Mon. 665	48 59 57.90 101 30 20.50	89 54 19 269 53 10	Mon. 664 Mon. 666		Mon. 697	48 59 57.73 100 30 45.08	90 02 18 270 01 04	Mon. 696 Mon. 698	1,006.9 3,079.5
Mon. 666	48 59 58.01 101 28 54.00	89 54 15 269 58 56	Mon. 665 Mon. 667	1, 758. 3 1, 859. 4	Mon. 698	48 59 57.67 100 28 13.58	90 02 59 269 59 46	Mon. 697 Mon. 699	3, 079. 5 2, 990. 7

Station	Latitude and longitude	Azimuth	To station	Distance (meters)	Station	Latitude and longitude	Azimuth	To station	Distance (meters)
Mon. 699	6 , ,, 48 59 57.65 100 25 46.44	90 01 37 270 01 47	Mon. 698 Mon. 700	2, 990. 7 1, 765. 1	Mon. 729	0 / // 48 59 57, 90 99 30 33, 12	0 / // 89 55 34 269 54 21	Mon. 728 Mon. 730	2, 275. 1 2, 063. 0
Mon. 700	48 59 57.61 100 24 19.61	90 02 52 270 01 25	Mon. 699 Mon. 701	1, 765. 1 2, 853. 5	Mon. 730	48 59 57.99 99 28 51.62	89 55 38 269 54 27	Mon. 729 Mon. 731	2, 063. 0 2, 066. 4
Mon. 701	48 59 57.55 100 21 59.22	90 03 11 270 01 39	Mon. 700 Mon. 702	2, 853. 5 1, 111. 1	Mon. 731	48 59 58, 09 99 27 09, 96	89 55 44 269 54 12	Mon. 730 Mon. 732	2, 066. 4 2, 111. 3
Mon. 702	48 59 57.53 100 21 04.56	90 02 21 269 59 18	Mon. 701 Mon. 703	1, 111. 1 1, 550. 1	Mon. 732	48 59 58, 19 99 25 26, 10	89 55 30 269 54 19	Mon. 731 Mon. 733	2, 111. 3 2, 187. 5
Mon. 703	48 59 57.53 100 19 48.30	90 00 16 269 59 26	Mon. 702 Mon. 704	1, 550. 1 1, 826. 3	Mon. 733	48 59 58.29 99 23 38.48	89 55 40 269 54 27	Mon. 732 Mon. 734	2, 187. 5 2, 330. 6
Mon. 704	48 59 57.53 100 18 18.45	90 00 34 270 00 48	Mon. 703 Mon. 705	1, 826. 3 3, 195. 6	Mon. 734	48 59 58.40 99 21 43.82	89 55 53 269 54 31	Mon. 733 Mon. 735	2, 330. 6 2, 514. 0
Mon. 705	48 59 57.48 100 15 41.24	90 02 47 270 01 18	Mon. 704 Mon. 706	3, 195. 6 1, 374. 4	Mon. 735	48 59 58.51 99 19 40.14	89 56 04 269 42 14	Mon. 734 Mon. 736	2, 514. 0 492. 9
Mon. 706	48 59 57.45 100 14 33.62	90 02 09 269 59 25	Mon. 705 Mon. 707	1, 374. 4 3, 360. 5	Mon. 736	48 59 58.59 99 19 15.89	89 42 33 269 53 34	Mon. 735 Mon. 737	492. 9 1, 838. 2
Mon. 707	48 59 57.44 100 11 48.29	90 01 30 270 00 14	Mon. 706 Mon. 708	3, 360. 5 1, 635. 3	Mon. 737	48 59 58.69 99 17 45.45	89 54 43 269 53 40	Mon. 736 Mon. 738	1, 838. 2 1, 796. 7
Mon. 708	48 59 57. 43 100 10 27. 84	90 01 15 270 00 20	Mon. 707 Mon. 709	1, 635. 3 2, 727. 0	Mon. 738	48 59 58.79 99 16 17.06	89 54 47 269 54 06	Mon. 737 Mon. 739	
Mon. 709	48 59 57.40 100 08 13.68	90 02 02 270 00 29	Mon. 708 Mon. 710	2, 727. 0 2, 034. 8	Mon. 739	48 59 58.88 99 14 46.96	89 55 14 269 53 56	Mon. 738 Mon. 740	1, 831. 3 1, 571. 7
Mon. 710	48 59 57.38 100 06 33.58	90 01 45 270 00 19	Mon. 709 Mon. 711	2, 034. 8 3, 079. 2	Mon. 740	48 59 58.96 99 13 29.64	89 54 55 269 55 09	Mon. 739 Mon. 741	1, 571. 7 1, 605. 0
Mon. 711	48 59 57.34 100 04 02.09	90 02 13 270 00 23	Mon. 710 Mon. 711-A	3, 079. 2 1, 105. 2	Mon. 741	48 59 59.03 99 12 10.68	89 56 08 269 55 01	Mon. 740 Mon. 742	1, 605. 0 1, 832. 4
Mon. 711-A	48 59 57, 33 100 03 07, 72	90 01 04 270 01 04	Mon. 711 Mon. 711-B	1, 105. 2 30. 21	Mon. 742	48 59 59.11 99 10 40.53	89 56 09 269 53 13	Mon. 741 Mon. 743	1, 832, 4 1, 174, 6
Mon. 711-B	48 59 57.33 100 03 06.23	90 01 05 270 01 05	Mon. 711-A Mon. 712	30. 21 1, 782. 3	Mon. 743	48 59 59.18 99 09 42.75	89 53 57 269 52 56	Mon. 742 Mon. 744	1, 174. 6 2, 660. 1
Mon. 712	48 59 57.30 100 01 38.55	90 02 11 270 01 42	Mon. 711-B Mon. 713	1, 782, 3 2, 261, 7	Mon. 744	48 59 59.33 99 07 31,88	89 54 35 269 52 54	Mon. 743 Mon. 745	2, 660. 1 2, 249. 5
Mon. 713	48 59 57.25 99 59 47.28	90 03 06 270 00 31	Mon. 712 Mon. 714	2, 261. 7 1, 417. 8	Mon. 745	48 59 59.47 99 05 41,21	89 54 18 269 53 59	Mon. 744 Mon. 746	2, 249. 5 1, 745. 5
Mon. 714	48 59 57.24 99 58 37.53	90 01 24 270 00 34	Mon. 713 Mon. 715	1, 417. 8 3, 345. 4	Mon. 746	48 59 59.56 99 04 15.34	89 55 04 269 54 05	Mon. 745 Mon. 747	1, 745. 5 1, 745. 7
Mon. 715	48 59 57.19 99 55 52.95	90 02 38 270 00 56	Mon. 714 Mon. 716	3, 345. 4 1, 950. 1	Mon. 747	48 59 59.64 99 02 59.29	89 55 02 269 55 03	Mon. 746 Mon. 748	1, 545. 7 229. 2
Mon. 716	48 59 57.16 99 54 17.01	90 02 08 270 01 03	Mon. 715 Mon. 717	1, 950. 1 2, 326. 2	Mon. 748	48 59 59.65 99 02 48.02	89 55 12 269 53 18	Mon. 747 Mon. 749	229. 2 1, 611. 9
Mon. 717	48 59 57.12 99 52 22,56	90 02 30 270 01 37	Mon. 716 Mon. 718	2, 326. 2 2, 062. 3	Mon. 749	48 59 59.74 99 01 28.71	89 54 18 269 54 20	Mon. 748 Mon. 750	1, 611. 9 1, 082. 8
Mon. 718	48 59 57.08 99 50 41.11	90 02 53 270 00 44	Mon. 717 Mon. 719	2, 062. 3 1, 959. 2	Mon. 750	48 59 59.80 99 00 35.44	89 55 00 269 55 01	Mon. 749 Mon. 751	1, 082. 8 586. 9
Mon. 719	48 59 57.05 99 49 04.72	90 01 57 270 01 15	Mon. 718 Mon. 720		Mon. 751	48 59 59.82 99 00 06.57	89 55 23 269 53 57	Mon. 750	586. 9
Mon. 720	48 59 56.99 99 46 43.14	90 03 02 269 54 55	Mon. 719 Mon. 721	2, 877. 9 1, 618. 7	Mon. 752	48 59 59.91 98 58 47.15	89 54 57 269 51 03	Mon. 751 Mon. 753	1,614.3
Mon, 721	48 59 57.06 99 45 23.50	89 55 55 269 54 49	Mon. 720 Mon. 722	1, 618. 7 1, 562. 3	Mon. 753	49 00 00.04 98 57 27.78	89 52 03 269 54 55	Mon. 752 Mon. 754	1, 613. 4
Mon. 722	48 59 57.13 99 44 06.64	89 55 47 269 54 07	Mon. 721 Mon. 723	1, 562. 3 2, 705. 7	Mon. 754	49 00 00.11 98 56 08.37	89 55 55 269 53 57	Mon. 753 Mon. 755	1,614.1
Mon. 723	48 59 57.26 99 41 53,53	89 55 48 269 54 09	Mon. 722 Mon. 724	2, 705. 7 2, 932. 2	Mon. 755	49 00 00. 19 98 54 49. 10	89 54 57	Mon. 754 Mon. 756	1,611.3
Mon. 724	48 59 57.40 99 39 29.27	89 55 58 269 54 25	Mon. 723 Mon. 725	2, 932. 2 2, 934. 4	Mon. 756	49 00 00. 23 98 53 29. 83	269 56 59 89 57 59 269 57 59	Mon. 755 Mon. 757	1,611.1
Mon. 725	48 59 57.53 99 37 04.90	89 56 14 269 54 25	Mon. 724 Mon. 726	2, 934. 4 2, 409. 3	Mon. 757	49 00 00. 25 98 52 10. 33	89 58 59	Mon. 756 Mon. 758	1, 615. 9
Mon. 726	48 59 57.64 99 35 06.37	89 55 54 269 54 34	Mon. 725	2, 409. 3 1, 817. 1	Mon. 758	49 00 00. 27 98 50 50. 85	269 58 11 89 59 11 260 57 20	Mon. 757 Mon. 759	1, 615, 5 1, 615, 5
Mon. 727	48 59 57.72 99 33 36.98	89 55 42 269 54 40	Mon. 726	1, 817. 1 1, 817. 1 1, 462. 1	Mon. 759	49 00 00.30	269 57 30 89 58 30	Mon. 758 Mon. 760	1, 615. 5 1, 615. 5
Mon. 728	48 59 57.79	89 55 34 269 54 10	Mon. 727 Mon. 729	1, 462, 1	Mon. 760	98 49 31.38 49 00 00.32 98 48 12.00	269 58 20 89 59 20 269 57 28	Mon. 759	1, 613. 3 1, 613. 3

BOUNDARY MONUMENTS—GEORGIA STRAIT TO LAKE OF THE WOODS—Continued

Station	Latitude and longitude	Azimuth	To station	Distance (meters)	Station	Latitude and longitude	Azimuth	To station	Distance (meters)
Mon. 761	o ' '' 49 00 00.35 98 46 52.58	9 58 28 269 57 14	Mon. 760 Mon. 762	1, 614. 5 1, 550. 3	Mon. 793	o , ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	0 / // 89 56 10 269 53 43	Mon. 792 Mon. 794	1, 607. 0 1, 612. 8
Mon. 762	49 00 00, 38 98 45 36, 31	89 58 12 269 57 37	Mon. 761 Mon. 763	1, 550. 3 1, 680. 6	Mon. 794	49 00 01.45 98 03 15.51	89 54 43 269 56 37	Mon. 793 Mon. 795	1, 612. 8 1, 642. 4
Mon. 763	49 00 00.42 98 44 13.62	89 58 40 269 57 12	Mon. 762 Mon. 764	1, 680. 6 1, 611. 4	Mon. 795	49 00 01, 49 98 01 54, 71	89 57 38 269 53 38	Mon. 794 Mon. 796	1, 642, 4 1, 581, 7
Mon. 764	49 00 00.45 98 42 54.35	89 58 12 269 58 00	Mon. 763 Mon. 765	1, 611. 4 1, 510. 2	Mon. 796	49 00 01, 58 98 00 36, 90	89 54 37 269 58 23	Mon. 795 Mon. 797	1, 581. 7 1, 601. 1
Mon. 765	49 00 00.47 98 41 40.05	89 58 56 269 57 57	Mon. 764 Mon. 766	1, 510. 2 1, 767. 7	Mon. 797	49 00 01.60 97 59 18.12	89 59 22 269 59 00	Mon. 796 Mon. 798	1, 601. 1 1, 620. 1
Mon. 766	49 00 00.50 98 40 13.08	89 59 03 269 58 38	Mon. 765 Mon. 767	1, 767. 7 1, 568. 1	Mon. 798	49 00 01, 60 97 57 58, 42	90 00 00 269 55 18	Mon. 797 Mon. 799	1, 620. 1 1, 654. 6
Mon. 767	49 00 00.51 98 38 55.93	89 59 36 269 56 19	Mon. 766 Mon. 768	1, 568. 1 1, 609. 4	Mon. 799	49 00 01, 67 97 56 37, 01	89 56 19 269 57 46	Mon. 798 Mon. 800	1, 654. 6 1, 571. 1
Mon. 768	49 00 00.56 98 37 36.75	89 57 18 269 57 17	Mon. 767 Mon. 769	1, 609. 4 1, 612. 2	Mon. 800	49 00 01.69 97 55 19.72	89 58 45 269 56 44	Mon. 799 Mon. 801	1, 571. 1 1, 616. 7
Mon. 769	49 00 00.60 98 36 17.43	89 58 17 269 58 51	Mon. 768 Mon. 770	1, 612. 2 1, 614. 6	Mon. 801	49 00 01, 74 97 54 00, 18	89 57 44 269 58 00	Mon. 800 Mon. 802	1, 616. 7 1, 615. 4
Mon. 770	49 00 00, 61 98 34 58, 00	89 59 51 269 58 21	Mon. 769 Mon. 771	1, 614, 6 1, 614, 5	Mon. 802	49 00 01.76 97 52 40.70	89 59 00 269 57 22	Mon. 801 Mon. 803	1, 615. 4 1, 602, 3
Mon. 771	49 00 00.63 98 33 38.57	89 59 21 269 56 40	Mon. 770 Mon. 772	1, 614. 5 1, 615. 9	Mon. 803	49 00 01.79 97 51 21.87	89 58 22 269 57 36	Mon. 802 Mon. 804	1, 602. 3 1, 624. 3
Mon. 772	49 00 00.67 98 32 19.07	89 57 40 269 58 36	Mon. 771 Mon. 773	1, 615. 9 1, 612. 0	Mon. 804	49 00 01, 82 97 50 01, 94	89 58 36 269 56 20	Mon. 803 Mon. 805	1, 624. 7 1, 457. 6
Mon. 773	49 00 00.68 98 30 59.76	89 59 36 269 58 06	Mon. 772 Mon. 774	1, 612. 0 1, 632. 7	Mon. 805	49 00 01, 86 97 48 50, 23	89 57 14 269 57 58	Mon. 804 Mon. 806	1, 457. 6 1, 767.
Mon. 774	49 00 00.71 98 29 39.44	89 59 06 269 58 05	Mon. 773 Mon. 775	1, 632. 7 1, 594. 4	Mon. 806	49 00 01.89 97 47 23,27	89 59 03 269 56 56	Mon. 805 Mon. 807	1, 767. 4 1, 610.
Mon. 775	49 00 00.73 98 28 21.00	89 59 04 269 57 37	Mon. 774 Mon. 776	1, 594. 4 1, 593. 0	Mon. 807	49 00 01, 93 97 46 04, 04	89 57 56 269 57 26	Mon. 806 Mon. 808	1, 610. 1, 703.
Mon. 776	49 00 00.76 98 27 02.62	89 58 36 269 58 34	Mon. 775 Mon. 777	1, 593. 0 1, 612. 3	Mon. 808	49 00 01.96 97 44 40.23	89 58 29 269 57 37	Mon. 807 Mon. 809	1, 703. 1 1, 521.
Mon. 777	49 00 00.77 98 25 43.30	89 59 34 269 56 35	Mon. 776 Mon. 778	1, 612. 3 1, 615. 3	Mon. 809	49 00 01.99 97 43 25.36	89 58 33 269 56 21	Mon. 808 Mon. 810	1, 521. 5 1, 611.
Ion, 778	49 00 00, 82 98 24 23, 83	89 57 35 269 58 41	Mon. 777 Mon. 779	1, 615. 3 1, 611. 7	Mon. 810	49 00 02 04 97 42 06 09	89 57 21 269 59 23	Mon. 809 Mon. 811	1, 611. 3 1, 598. 8
Mon. 779	49 00 00. 83 98 23 04. 53	89 59 41 269 57 03	Mon. 778 Mon. 780	1, 611. 7 1, 612. 1	Mon. 811	49 00 02 04 97 40 47, 43	90 00 23 270 01 17	Mon. 810 Mon. 812	1, 598. 1 1, 615.
Ion. 780	49 00 00, 86 98 21 45, 22	89 58 03 269 58 01	Mon. 779 Mon. 781	1, 612. 1 1, 612. 5	Mon. 812	49 00 02 01 97 39 27, 96	90 02 17 269 59 30	Mon. 811 Mon. 813	1, 615. 3 1, 614.
Mon. 781	49 00 00.89 98 20 25.89	89 59 01 269 56 53	Mon. 780 Mon. 782	1, 612. 5 1, 616. 8	Mon. 813	49 00 02 01 97 38 08 53	90 00 30 270 02 16	Mon. 812 Mon. 814	1, 614. 6 1, 614. 6
Ion. 782	49 00 00.93 98 19 06.35	89 57 53 269 55 16	Mon. 781 Mon. 783	1, 616. 8 1, 611. 5	Mon. 814	49 00 01.97 97 36 49.12	90 03 16 270 00 14	Mon. 813 Mon. 815	1, 614. 0 1, 613. 3
Ion, 783	49 00 00.99 98 17 47.07	89 56 16 270 00 54	Mon. 782 Mon. 784	1, 611. 5 1, 614. 4	Mon. 815	49 00 01, 96 97 35 29, 75	90 01 14 270 01 03	Mon. 814 Mon. 816	1, 613. 5 1, 611.
Aon. 784	49 00 00.97 98 16 27.64	90 01 54 269 59 42	Mon. 783 Mon. 785	1, 614. 4 1, 412. 9	Mon. 816	49 00 01.93 97 34 10.46	90 02 03 270 00 33	Mon. 815 Mon. 817	1, 611. 7 1, 614. 0
Mon. 785	49 00 00.97 98 15 18.13	90 00 35 269 56 42	Mon. 784 Mon. 786	1, 412. 9 658. 4	Mon. 817	49 00 01.92 97 32 51.06	90 01 33 270 01 04	Mon. 816 Mon. 818	1, 614. 0 1, 611.
Mon. 786	49 00 00.99 98 14 45.74	89 57 07 270 00 05	Mon. 785 Mon. 787	658. 4 2, 618. 7	Mon. 818	49 00 01.89 97 31 31.78	90 02 04 270 00 25	Mon. 817 Mon. 819	1, 611. 4 1, 611. (
Mon. 787	49 00 00.96 98 12 36.90	90 01 42 270 03 02	Mon. 786 Mon. 788	2, 618. 7 1, 745. 3	Mon. 819	49 00 01.88 97 30 12.52	90 01 25 270 00 33	Mon. 818 Mon. 820	1, 611. (1, 610. (
Mon. 788	49 00 00.91 98 11 11.04	90 04 07 269 49 30	Mon. 787 Mon. 789	1, 745. 3 1, 610. 1	Mon. 820	49 00 01.86 97 28 53.28	90 01 33 270 00 48	Mon. 819 Mon. 821	1, 610. 6 1, 610. 3
Mon. 789	49 00 01.06 98 09 51.83	89 50 30 269 54 48	Mon. 788 Mon. 790	1, 610. 1 1, 610. 7	Mon. 821	49 00 01.84 97 27 34.06	90 01 48 270 00 49	Mon. 820 Mon. 822	1, 610. 3 1, 612. 1
Aon. 790	49 00 01.13 98 08 32.59	89 55 48 269 54 30	Mon. 789 Mon. 791	1, 610. 7 1, 614. 2	Mon. 822	49 00 01.82 97 26 14.74	90 01 49 270 00 13	Mon. 821 Mon. 823	1, 612. 1 1, 612. 3
Mon. 791	49 00 01. 20 98 07 13. 17	89 55 30 269 53 42	Mon. 790 Mon. 792	1, 614. 2 1, 610. 8	Mon. 823	49 00 01, 81 97 24 55, 42	90 01 13 270 01 09	Mon. 822 Mon. 824	1, 612. 3 1, 613. 3
Mon. 792	49 00 01. 29 98 05 53. 92	89 54 42 269 55 10	Mon. 791 Mon. 793	1, 610. 8 1, 607. 0	Mon. 824	49 00 01, 79 97 23 36, 05	90 02 09 270 03 25	Mon. 823 Mon. 825	1, 613. 2 1, 612. 3

Station	Latitude and longitude	Azimuth	To station	Distance (meters)	Station	Latitude and longitude	Azimuth	To station	Distance (meters)
Mon. 825	97 22 16, 73	90 04 25 269 57 27	Mon. 824 Mon. 826	1, 612. 3 1, 612. 0	Mon. 854	0 / // 49 00 00.71 96 45 16.07	0 / // 90 02 29 270 00 59	Mon. 853 Mon. 855	1, 612. 1 1, 615. 3
Mon. 826	49 00 01.76 97 20 57.42	89 58 27 270 00 36	Mon. 825 Mon. 827	1, 612. 0 1, 609. 8	Mon. 855	49 00 00.68 96 43 56.60	90 01 59 270 01 10	Mon. 854 Mon. 856	1, 615. 3 1, 606. 3
Mon. 827	49 00 01.74 97 19 38.22	90 01 36 269 56 29	Mon. 826 Mon. 828	1, 609. 8 1, 609. 8	Mon. 856	49 00 00.66 96 42 37.56	90 02 10 270 00 16	Mon. 855 Mon. 857	
Mon. 828	49 00 01.79 97 18 19.02	89 57 29 270 03 54	Mon. 827 Mon. 829	1, 609. 8 1, 609. 8	Mon. 857	49 00 00.65 96 41 17.91	90 01 16 270 01 53	Mon. 856 Mon. 858	1000
Mon. 829	49 00 01.72 97 16 59.82	90 04 53 270 00 14	Mon. 828 Mon. 830	1, 609. 8 1, 610. 1	Mon. 858	49 00 00.61 96 39 58.37	90 02 53 270 00 56	Mon. 857 Mon. 859	1, 616. 1 1, 605.
Mon. 830	49 00 01.71 97 15 40.61	90 01 14 270 00 13	Mon. 829 Mon. 831	1, 610. 1 1, 610. 7	Mon. 859	49 00 00, 59 96 38 39, 39	90 01 55 270 01 06	Mon. 858 Mon. 860	T. C. W. C. C. C.
Mon. 831	49 00 01.70 97 14 21.36	90 01 13 270 01 13	Mon. 830 Mon. 832	1, 610. 7 116. 1	Mon. 860	49 00 00.56 96 37 20.17	90 02 06 269 59 41	Mon. 859 Mon. 861	1, 610. 1 1, 616. 0
Mon. 832	49 00 01.70 97 14 15.65	90 01 17 270 03 05	Mon. 831 Mon. 832-A	116. 1 199. 6	Mon. 861	49 00 00.56 96 36 00.67	90 00 41 270 01 30	Mon. 860 Mon. 862	
Mon. 832-A	49 00 01.69 97 14 05.83	90 03 12 270 03 12	Mon. 832 Mon. 833	199. 6 1, 296. 3	Mon. 862	49 00 00.53 96 34 41.26	90 02 30 270 00 32	Mon. 861 Mon. 863	1, 614. 1 1, 616. 7
Mon. 833	49 00 01.65 97 13 02.05	90 04 00 270 01 58	Mon. 832-A Mon. 833-A	1, 296. 3 715. 1	Mon. 863	49 00 00.51 96 33 21.72	90 01 32 269 56 10	Mon. 862 Mon. 864	1000000
Mon. 833–A	49 00 01.63 97 12 26.88	90 02 24 270 02 24	Mon. 833 Mon. 833-B	715. 1 65. 7	Mon. 864	49 00 00, 57 96 32 02, 37	89 57 10	Mon. 863 Mon. 865	1, 612. 8
Mon. 833–B	49 00 01.63 97 12 23.64	90 02 27 270 02 27	Mon. 833-A Mon. 834	65. 7 831. 0	Mon. 865	49 00 00. 50 96 30 43. 35	270 03 48 90 04 48 270 03 54	Mon. 864 Mon. 866	1,606.3
Mon. 834	49 00 01.61 97 11 42.76	90 02 58 270 03 32	Mon. 833-B Mon. 835	831. 0 1, 582. 8	Mon. 866	49 00 00. 43 96 29 23. 16	90 04 54 270 01 05	Mon. 865 Mon. 867	
Mon. 835	49 00 01.55 97 10 24.89	90 04 31 270 02 20	Mon. 834 Mon. 836	1, 582. 8 1, 642. 9	Mon. 867	49 00 00. 41 96 27 58. 14	90 02 09 270 01 30	Mon. 866 Mon. 868	
Mon. 836	49 00 01.51 97 09 04.06	90 03 21 270 02 41	Mon. 835 Mon. 837	1, 642. 9 1, 612. 3	Mon. 868	49 00 00.38 96 26 44.56	90 02 26 270 01 34	Mon. 867 Mon. 869	The state of the s
Mon. 837	49 00 01.46 97 07 44.74	90 03 41 270 00 58	Mon. 836 Mon. 838	1, 612. 3 1, 613. 2	Mon. 869	49 00 00.35 96 25 19.59	90 02 38	Mon. 868 Mon. 870	
Mon. 838	49 00 01.44 97 06 25.37	90 01 58 270 05 15	Mon. 837 Mon. 839	1, 613. 2 1, 612. 9	Mon. 870	49 00 00. 32 96 24 06. 08	90 02 16	Mon. 869	1, 494.
Mon. 839	49 00 01.35 97 05 06.02	90 06 15 270 03 18	Mon. 838 Mon. 840	1, 612. 9	Mon. 871	49 00 00. 28 96 22 41. 04	90 02 46	Mon. 871 Mon. 870 Mon. 872	1, 728. 4
Mon. 840	49 00 01.29 97 03 46.72	90 04 18 270 02 27	Mon. 839 Mon. 841	1, 611. 9	Mon. 872	49 00 00, 26	90 02 17	Mon. 871 Mon. 873	1, 492.
Mon. 841	49 00 01.25	90 03 26	Mon. 840	1, 612. 3	Mon. 873	96 21 27, 62 49 00 00, 24	270 00 53 90 01 57	Mon. 872 Mon. 874	1,729.2
Mon. 842	97 02 27.39 49 00 01.20	90 03 31	Mon. 841	1, 613. 8	Mon. 874	96 20 02, 54 49 00 00, 22	270 00 17 90 01 13	Mon. 873 Mon. 875	
Mon. 843	97 01 08.00 49 00 01.23	269 57 55 89 58 55	Mon. 842	1, 613. 1	Mon, 875	96 18 48, 95 49 00 00, 19	270 01 23 90 02 27	Mon. 874 Mon. 874	
Mon. 844	96 59 48.64 49 00 01.12	90 07 44	Mon. 843	1, 613. 1 1, 613. 1	Mon. 876	96 17 23. 92 49 00 00. 17	270 00 50 90 01 46	Mon. 875	
Mon. 845	96 58 29.28 49 00 01.08	270 02 05 90 03 05	Mon. 845 Mon. 844	1, 612. 2 1, 612. 2	Mon. 877	96 16 10.32 49 00 00.12	270 02 41 90 03 45	Mon. 876	1, 730. 7 1, 730. 7
Mon. 846	96 57 09.96 49 00 01.03	270 02 25 90 03 25	Mon. 845	1, 613. 3 1, 613. 3	Mon. 878	96 14 45.17 49 00 00.11	270 00 28 90 01 24	Mon. 878 Mon. 877	1, 497. 0
Mon. 847	96 55 50, 59 49 00 01, 00	270 01 38 90 02 38	Mon. 846	1, 611. 8 1, 611. 8	Mon. 879	96 13 31.52 49 00 00.06	270 02 16 90 03 20	Mon. 879	1, 727. 4
Mon. 848	96 54 31. 29 49 00 00. 97	90 02 44	Mon. 848 Mon. 847	1, 612. 9 1, 612. 9	Mon. 880	96 12 06.54 49 00 00.05	270 00 36 90 01 36	Mon. 880 Mon. 879	1, 611. 6
Mon, 849	96 53 11.94 49 00 00.91	270 03 05 90 04 05	Mon. 848	1, 612. 0 1, 612. 0	Mon. 881	96 10 47. 25 49 00 00. 02	270 01 19 90 02 19	Mon. 881 Mon. 880	1, 615. 8 1, 615. 8
Mon. 850	96 51 52.63 49 00 00.88	270 01 51 90 02 51	Mon. 849	1, 612. 7 1, 612. 7	Mon. 882	96 09 27. 76 48 59 59. 99	270 01 20 90 02 20	Mon. 882	1, 611.
Mon, 851	96 50 33. 29 49 00 00. 80	270 04 11 90 05 11	Mon. 851	1, 610. 3	Mon. 883	96 08 08.49 48 59 59.97	270 00 49 90 01 48	Mon. 882	1, 608. 9
Mon, 852	96 49 14.07 49 00 00.73	90 05 11 270 04 20 90 05 20	Mon. 852 Mon. 851	1, 613. 0		96 06 49.34	270 02 25	Mon. 884	1, 608. 9 1, 610. 0
	96 47 54.71	269 59 09	Mon. 853	1, 613. 0 1, 612. 4	Mon. 884	48 59 59.93 96 05 30.14	90 03 25 270 00 19	Mon. 883 Mon. 885	1, 607. 2
Mon. 853	49 00 00.74 96 46 35.38	90 00 09 270 01 29	Mon. 852 Mon. 854	1, 612. 4 1, 612. 2	Mon. 885	48 59 59.92 96 04 11.07	90 01 19 270 01 30	Mon. 884 Mon. 886	1, 607. 2 1, 607. 8

BOUNDARY MONUMENTS—GEORGIA STRAIT TO LAKE OF THE WOODS—Continued

Station	Latitude and longitude	Azimuth	To station	Distance (meters)	Station	Latitude and longitude	Azimuth	To station	Distance (meters
Mon. 886	6 / // 48 59 59 89 96 02 51 96	90 02 30 270 00 25	Mon. 885 Mon. 887	1, 607. 8 1, 612. 3	Mon. 909	6 / // 48 59 56 46 95 22 30 38	90 08 06 270 07 15	Mon. 908 Mon. 910	1, 463. 1, 757.
Mon. 887		90 01 25 270 01 05	Mon. 886 Mon. 888	1, 612.3 1, 566.8	Mon. 910	48 59 56.33 95 21 03.90	90 08 20 270 07 48	Mon. 909 Mon. 911	1, 757. 1, 657.
Mon. 888	48 59 59.85 96 00 15.56	90 02 03 270 06 03	Mon. 887 Mon. 889	1, 566. 8 2, 126. 6	Mon. 911	48 59 56, 20 95 19 42, 35	90 08 49 270 07 09	Mon. 910 Mon. 912	1, 657. 3, 176.
Mon. 889	48 59 59.72 95 58 30.93	90 07 22 270 06 12	Mon. 888 Mon. 890	2, 126. 6 2, 126. 0	Mon. 912	48 59 55, 96 95 17 06, 10	90 09 07 269 57 01	Mon. 911 T. P., Buffalo Bay (Lake of the Woods).	3, 176. 9, 664.
Mon. 890	48 59 59.58 95 56 46.34	90 07 31 270 08 47	Mon. 889 Mon. 891	2, 126. 0 1, 748. 7	T. P., Buffalo	48 59 55, 96	90 02 59	the Woods).	9, 664.
Mon. 891	48 59 59.42 95 55 20.30	90 09 52 270 06 34	Mon. 890 Mon. 892	1,748.7 2,888.9	Bay (Lake of the Woods).	95 09 10.65	179 58 53	Mon. 913	20, 213.
Mon, 892	48 59 59, 22 95 52 58, 17	90 08 21 270 06 39	Mon. 891 Mon. 893	2, 888. 9 2, 049. 8	Mon. 913	49 10 50, 28 95 09 10, 97	359 58 53	T. P., Buffalo Bay (Lake of the Woods).	20, 213.
Mon. 893	48 59 59.08 95 51 17.32	90 07 55 270 07 19	Mon. 892 Mon. 894	2, 049, 8 2, 678, 7	Mon. 914	49 11 47, 47	179 58 53 359 58 53	Mon. 913	1, 766. 1, 766.
Mon, 894	48 59 58.88 95 49 05.54	90 08 58 270 06 42	Mon. 893 Mon. 895	2, 678. 7 2, 572. 2	Mon. 915	95 09 11.00	179 58 53 359 58 53	Mon. 915	1, 834.
Mon. 895	48 59 58.69 95 46 58.99	90 08 17 270 06 42	Mon. 894 Mon. 896	2, 572, 2 2, 588, 2	Mon. 916	95 09 11, 03 49 13 50, 59	179 58 53 359 58 53	Mon. 914 Mon. 916	1, 969.
Mon. 896	48 59 58.51 95 44 51.66	90 08 18 270 07 07	Mon. 895 Mon. 897	2, 588. 2 3, 018. 0	Mon. 917	95 09 11,06	179 58 53 359 58 53	Mon. 917 Mon. 916	1, 826. 1, 826.
Mon. 897	48 59 58.28 95 42 23.18	90 08 59 270 07 25	Mon. 896 Mon. 898	3, 018. 0 3, 020. 4	Mon. 918	95 09 11.09 49 16 10.74	179 58 53 359 58 53	Mon. 918 Mon. 917	2, 503. 2, 503.
Mon. 898	95 39 54, 58	90 09 17 270 11 06	Mon. 897 Mon. 899	3, 020. 4 417. 9	Mon. 919	95 09 11.13	179 58 53 359 58 53	Mon. 919 Mon. 918	2, 062.
Mon. 899	95 39 34.02	90 11 21 270 05 31	Mon. 898 Mon. 900	417. 9 1, 430. 6	Mon. 920	95 09 11, 16 49 18 25, 81	179 58 53 359 58 53	Mon. 920 Mon. 919	2, 110. 2, 110.
Mon. 900	48 59 57.92 95 38 23.64	90 06 24 270 05 27	Mon. 899 Mon. 901	1, 430. 6 1, 431. 2	Mon. 921	95 09 11. 20 49 19 24. 20	179 58 53 359 58 53	Mon. 921 Mon. 920	1, 803. 1, 803.
Mon. 901	95 37 13, 22	90 06 20 270 07 32	Mon. 900 Mon. 902	1, 431. 2 2, 602. 0	Mon. 922	95 09 11. 23 49 20 51. 18	179 58 53 359 58 53	Mon. 922 Mon. 921	2 687
Mon, 902	95 35 05.21	90 09 09 270 07 27	Mon. 901 Mon. 903	2, 602. 0 2, 596. 8	Mon. 923	95 09 11. 27 49 21 48. 85	179 58 53 359 58 53	Mon. 923 Mon. 922	1, 781.
Mon. 903	95 32 57.45	90 09 04 270 07 44	Mon. 902 Mon. 904	2, 596. 8 2, 417. 0	Mon. 924	95 09 11.30 49 22 13.60	179 58 53 359 58 53	Mon. 924 Mon. 923	764.
Mon. 904	95 30 58, 54	90 09 14 270 07 36	Mon. 903 Mon. 905	2, 417. 0 2, 419. 2	Mon. 925	95 09 11, 31 49 22 39, 26	179 58 53 359 58 53	Mon. 925 Mon. 924	792. 792.
Mon. 905	95 28 59, 52	90 09 06 270 07 16	Mon. 904 Mon. 906	2, 419. 2 2, 387. 7		95 09 11.32	179 58 53	Mon. 924 T. P. 1, N. W. Angle Inlet, Lake of the	768.
Mon. 906	95 27 02, 05	90 08 45 270 07 12	Mon. 905 Mon. 907	2, 387. 7 1, 923. 2	T. P. 1,7 N. W.	49 23 04.14	359 58 53	Woods. Mon. 925	768.
Mon, 907	95 25 27.43	90 08 24 270 07 25	Mon. 906 Mon. 908	1, 923. 2 2, 135. 2	Angle Inlet, Lake of the Woods.	95 09 11, 34	89 58 31 269 58 31	Ref. Mon. 2 Ref. Mon. 1	386, 465,
Mon. 908	48 59 56, 57 95 23 42, 38	90 08 44 270 07 12	Mon. 907 Mon. 909	2, 135. 2 1, 463. 5					

⁷ The geographic coordinates used by the two Governments in the treaty of 1925 to define the location of this point are latitude 49°23′04″.49, longitude 95°09′11″.61. These coordinates were based on the original North American datum which, since the treaty of 1925, has been superseded by the North American datum of 1927, the geodetic datum on which all geographic positions of this section of the International Boundary Line are based.

GEOGRAPHIC POSITIONS OF MARKS AND MONUMENTS RANGING AND REFERENCING THE INTERNATIONAL BOUNDARY FROM THE GULF OF GEORGIA (GEORGIA STRAIT) TO THE NORTHWESTERNMOST POINT OF LAKE OF THE WOODS

Range Marks and Monuments	Latitude and longitude	Azimuth	Distance (meters)	To Range Marks and Monuments	
WEST SHORE POINT ROBERTS	0 / //	0 / //			
Offshore range mark ¹ ranging the course of the boundary westward through Georgia Strait from Monument 0 (zero).	49 00 08.10 123 06 39.52	270 04 40 270 04 40	1, 579. 8 1, 674. 1	Monument 0 (zero). Shore range mark, west shore Point Roberts.	
Shore range mark ² ranging the course of the boundary through Georgia Strait westward from Monument 0 (zero).	49 00 08.02 123 05 17.16	90 05 40 90 06 268 02	1, 674. 1 94. 30 4. 15	Offshore range mark, west shore Point Roberts. Monument 0 (zero). Monument 1.	
WEST SIDE BOUNDARY BAY					
Shore range mark! ranging the course of the boundary eastward from Monument 4 to Monument 5.	49 00 08.11 123 02 02.07	89 53 43 269 53 43 269 53 43	75. 11 1, 095. 1 20, 337. 0	Monument 4. Offshore range mark, west side Boundary Bay. Monument 5.	
Offshore range mark ranging the course of the boundary eastward from Monument 4 to Monument 5.	49 00 08.18 123 01 08.19	89 54 23 89 54 23 269 54 23	1, 170. 2 1, 095. 1 19, 241. 9	Monument 4. Shore range mark, west side Boundary Bay. Monument 5.	
EAST SIDE BOUNDARY BAY					
Offshore range \max^1 ranging the course of the boundary westward from Monument 5 to Monument 4.	49 00 08.21 122 46 50.14	90 05 11 270 05 11 270 05 11	18, 610. 2 1, 801. 9 1, 807. 4	Monument 4. Monument 5. Shore range mark, east shore Boundary Bay.	
Shore range mark ³ ranging the course of the boundary westward from Monument ⁵ to Monument ⁴ .	49 00 08.11 122 45 21.21	90 06 18 90 06 18 90 06 18	20, 417. 6 1, 807. 4 5, 50	Monument 4. Offshore range mark, east side Boundary Bay. Monument 5.	
LAKE OF THE WOODS		30 00 18	0.00	Transfer of	
Reference Monument 1 (east reference)	49 23 04.15 95 08 48,28	89 58 50 89 58 50	465. 1 851. 7	Turning point 1, Northwest Angle Inlet, Lake of the Woods. Reference Monument 2.	
Reference Monument 2 (west reference)	49 23 04.13 95 09 30.50	269 58 20	386.6	Turning point 1, Northwest Angle Inlet, Lake of the Woods.	
	The continue of the continue o	269 58 20	851.7	Reference Monument 1.	

This range mark, being exactly on the boundary, is also a boundary mark.
 This range mark is 0.155 meter south of the boundary.
 This range mark is 0.013 meter south of the boundary.

We certify that the foregoing is a true and accurate description and definition of the International Boundary Line between the United States of America and the Dominion of Canada from the Gulf of Georgia (Georgia Strait) to the Northwesternmost Point of Lake of the Woods, as reestablished by the Commissioners and as marked by them on the quadruplicate sets of fifty-nine accurate modern maps submitted with this report, in accordance with the provisions of Articles VI and VII of the Treaty between the United States and Great Britain signed at Washington April 11, 1908, and of Articles I, II, and IV of the Treaty between the United States and His Britannic Majesty in respect of the Dominion of Canada, signed at Washington February 24, 1925.

Washington, October 27, 1937. His Britannic Majesty's Commissioner.

United States Commissioner.

CONCLUSION

It is to be noted that with the submission of this report the terms of the treaty between the two Governments, signed at Washington April 11, 1908, have been fully carried out. The boundary between the United States and the Dominion of Canada from the Atlantic Ocean to the Pacific Ocean is now effectively marked throughout upon the ground by durable monuments and marks, laid down upon accurate modern charts or maps, and described in terms of a geodetic datum common to the two countries in interest. Its present state of effective demarcation and the provisions for continuous maintenance made by the two Governments in the treaty signed February 24, 1925, make it reasonably certain that a complete reestablishment of any portion of this boundary line will never again be necessary.

The reestablishment of the boundary from Georgia Strait to Lake of the Woods, described in this report, was begun by His Britannic Majesty's Commissioner W. F. King and United States Commissioners O. H. Tittmann and Charles D. Walcott in 1901. In conjunction with work on other parts of the International Boundary it was continued, following resignations and deaths, successively by Commissioners E. C. Barnard, E. Lester Jones, and James H. Van Wagenen for the United States, and by Commissioners J. J. McArthur and J. D. Craig for His Britannic Majesty. The work was completed by the present Commissioners, Thomas Riggs for the United

States, and Noel J. Ogilvie for His Britannic Majesty.

The preparation of this report was begun by Commissioners James H. Van Wagenen and Noel J. Ogilvie. It is with sorrow that we have to record the untimely death on May 17, 1935, of Mr. Van Wagenen, who for twenty-five years ably served the International Boundary Commission, as Topographic Engineer, Engineer to the Commission, and, from 1929 to his death, as Commissioner. We wish to bear wit-

ness to his excellent qualities as a public servant.

In accomplishing the results set forth herein the Commissioners have had the close cooperation and assistance of other departments and agencies of the two Governments. They refer particularly to the joint work of the Geodetic Survey of Canada and the United States Coast and Geodetic Survey in establishing the first-order control for the boundary triangulation; to the excellent work of the United States Geological Survey in printing the boundary maps; and to the many courtesies extended by the customs and immigration officials of both countries during the progress of the field work.

The Commissioners also desire to express their appreciation of the efficient and conscientious services of all their assistants who have taken part in the work. They are particularly indebted to Mr. Jesse Hill, Engineer to the United States Section of the Commission; to Mr. J. A. Pounder, D. L. S., Engineer to the Canadian Section of the Commission; to Mr. J. G. Hefty and Mr. Frank H. Brundage, Topographic

Engineers of the United States Section of the Commission; and to Mr. G. T. Prinsep, D. L. S., and Mr. D. F. Chisholm of the Canadian Section of the Commission. The competent and painstaking work done by these men in the field and in the office is worthy of the highest commendation.

It is most gratifying to state that throughout the course of the work of carrying out the provisions of the boundary treaties the most cordial relations have existed between the Commissioners and between their assistants in both countries, and that their duties have been performed in a spirit of hearty cooperation.

Washington, October 27, 1937.

His Britannic Majesty's Commissioner.

United States Commissioner.

APPENDIX I

HISTORICAL SKETCH

This historical sketch is presented in order to show to some extent how and why the section of the International Boundary between the United States and Canada from Georgia Strait to Lake of the Woods has been adopted as such by the two countries.

The historical background of all the boundary between the United States and Canada has its beginning in the earliest discoveries, explorations, and settlements of the North American Continent by European nations. As soon as Columbus returned from his first voyage and reported the existence of islands and a continent to the west, partitioning of the newly discovered territory between the European nations was begun. In 1493 Pope Alexander VI issued a bull defining a line of separation of the spheres of influence of the Kingdoms of Spain and Portugal. The following year these two countries agreed by treaty upon a different line, somewhere near the present meridian of 60 degrees. All territories east of this line were to belong to Portugal, while all those west of it were to fall within the Spanish sphere. This partitioning, however, was not recognized by England and France and it soon disappeared. But partitioning of the newly discovered continent did not cease. Claims to territory by discovery, exploration, and settlement were set up by Portugal, Spain, France, England, and Holland, and in the northwest by Russia, with consequent overlapping boundaries in a country of which the geography was almost wholly unknown.

At the time the independence of the United States was recognized, the claims of European countries to different portions of the eastern part of the North American Continent were fairly well recognized although the actual boundaries separating them had not yet been laid down upon the ground. The possessions of the United States were quite clearly set forth in the Treaty of Paris, September 3, 1783, but the actual boundaries were as yet undetermined.

Originally the United States possessions extended west as far as the Mississippi River and south to latitude 32°. To the west and south was Spanish territory. Thus the mouth of the great river was under foreign control, as Spain possessed both banks at that time.

The free navigation of the Mississippi was a matter of vital concern to the United States, whose western line of settlements depended upon the river as a highway to the markets and whose products and imports must pass through its mouth. By treaty with Spain in 1795 the right was secured to deposit merchandise and effects of United States citizens at New Orleans. Article XXII of this treaty, which has to do with right of deposit is in part as follows:

* * his Catholic Majesty will permit the Citizens of the United States for the space of three years from this time to deposit their merchandise and effects in the Port of New Orleans,

and to export them from thence without paying any other duty than a fair price for the hire of the stores, and his Majesty promises either to continue this permission * * *, or if he should not agree to continue it there, he will assign to them on another part of the banks of the Mississippi an equivalent establishment.

Therefore, when it was rumored that Spain had ceded Louisiana to France,¹ fears were at once aroused lest the French should exercise a more exclusive and vigorous policy than had the Spaniards. Following this rumor, came the announcement that the Spanish governor had proclaimed that the right of deposit no longer existed. This produced an outburst of intense indignation from the Americans, and remonstrance came from the settlers and planters on lands tributary to the Mississippi. Their inference was that a policy of exclusion was to be the order, which would mean the loss of navigation rights along the Mississippi, the extinction of American commerce, and the abandonment of flourishing communities already there established. When the actual fact of the retrocession of Louisiana from Spain to France in the Treaty of San Ildefonso in 1800 became known, it only increased the previous ill feeling caused by the rumor.

War between France and Great Britain was imminent. The United States therefore determined to press negotiations upon France at once. It was suggested that if France declined to cede New Orleans to the United States, then sufficient territory should be sought upon which to establish a large commercial town on the bank of the river; or if unable to procure complete jurisdiction over any convenient spot whatsoever, the envoys were instructed to secure a right of deposit with the privilege of holding real estate for commercial purposes. The exigency seemed to require the best effort and the best talent, and to that end James Monroe was selected to cooperate with Robert Livingston, the United States Minister to

Napoleon's court.

Napoleon, now confronted with the certainty of a gigantic war with Great Britain, knew that colonies far distant across the seas must be protected by sufficient naval forces and at great cost. Great Britain was a great naval power while France in this respect was far inferior. It required but little reflection for Napoleon to appreciate the disastrous consequences if immediate action by him should not be adopted as to Louisiana. He therefore authorized the sale of Louisiana, and for \$15,000,000 the territory was ceded to the United States by the treaties ratified and proclaimed October 21, 1803.

At the time the treaty for the cession of Louisiana to the United States was concluded, the Spaniards still remained in possession of the country. The Spanish Government had already protested against the transfer of Louisiana to the United States as being contrary to the engagements previously made by France, of which, however, no proof was shown; and some disposition was at first manifested on the part of the Spanish authorities at New Orleans, and in the Provinces of Mexico adjacent, to dispute the entrance of the Americans. This opposition was, however, soon abandoned.

¹ The Louisiana Territory was originally a French possession. New Orleans was founded as a French settlement in 1718. France ceded the territory to Spain in 1762. Spain took actual possession in 1769 and remained in possession by title until the secret Treaty of San Ildefonso in 1800 by which she receded the territory to France.

The limits of the Louisiana Territory had never been definitely set forth. On the south and the west was Spanish territory; on the north was British territory. As to whether the Louisiana Territory extended west of the summit of the Rocky Mountains is a question on which authorities are not in accord, but it seems to have been quite generally understood that it did extend that far. Negotiations for the adjustment of the lines which were to separate their respective territories were commenced by the United States and Spain at Madrid in 1804. The results of these negotiations have here no further interest except as to the western limits of the Louisiana Territory which will be touched on later.

The northern limits of the Louisiana Territory now became a question between Great Britain and the United States, and negotiations toward a settlement of the question were soon begun.

Before giving an account of these negotiations it would be well to set forth briefly the status of Great Britain's possessions to the north.

The precise lines of boundary which divided the territories formerly belonging to the Crowns of England and France in America seem never to have been distinctly defined. The voyages of discovery by the English and by the French to the east coast of North America and their endeavors to form settlements on the new continent had been nearly contemporaneous; and as both nations indefinitely laid claims to extensive dominions, of which neither had the power of taking actual possession, it was inevitable that the claims of the two nations should become incompatible.

Before the cession of Canada to Great Britain by France in 1763, French explorers, traders, and trappers had explored the country and extended their operations westward from the settlements on the St. Lawrence River through the Great Lakes and beyond, as far as what is now the Dakotas and Manitoba. Pierre de La Vérendrye is even credited with reaching the foothills of the Rocky Mountains. Outstanding among these French explorers were: Groseilliers and Radisson, the adventurous brothers-in-law who began their wandering adventures in 1654 and who later were largely responsible for the organization of the Hudson's Bay Company in 1670; Daniel Greysolon, Sieur Dulhut; Jacques de Noyon, who pursued a search for the "Western Sea"; Lieutenant La Noüe; Sieur de La Vérendrye and his three sons, who so persistently followed the search for the "Western Sea" from 1731 to 1749; St. Pierre; and La Corne.

The detailed history of the activities of these adventurous spirits, although fascinating reading, cannot be included in this short sketch. It is sufficient to state that they established a canoe route from the St. Lawrence through the Ottawa River and the Great Lakes and connecting waterways as far west as Lake of the Woods, Lake Winnipeg, and the Red River. They established trading posts along the route, developed an extensive and profitable fur trade with the Indians, and added immeasurably to the geographic knowledge of the country.

After the cession of Canada to Great Britain in 1763, explorations chiefly in the interests of trapping and trading with the Indians under the auspices of the two great fur companies, the Hudson's Bay Company and the North West Company, were carried farther westward by expeditions headed by English-speaking employees of the

two companies. The occupancy of the country by the fur companies followed these explorations.

The Hudson's Bay Company not only enjoyed the sole privileges of trade and commerce under its charter, but also had the privilege of government. The charter, granted by Charles II in the year 1670, reads in part as follows:

* * * AND WHEREAS the said Undertakers, for their further Encouragement in the said Design, have humbly besought Us to incorporate them, and grant unto them, and their Successors, the sole Trade and Commerce of all those Seas, Streights, Bays, Rivers, Lakes, Creeks, and Sounds, in whatsoever Latitude they shall be, that lie within the entrance of the Streights commonly called Hudson's Streights, together with all the Lands, Countries and Territories, upon the Coasts and Confines of the Seas, Streights, Bays, Lakes, Rivers, Creeks, and Sounds, aforesaid, which are not now actually possessed by any of our Subjects, or by the Subjects of any other Christian Prince or State; * * * We give, grant, and confirm, unto the said Governor and Company, and their Successors, the sole Trade and Commerce of all those Seas, * * * with the Fishing of all Sorts of Fish, Whales, Sturgeons, and all other Royal Fishes, in the Seas, Bays, Inlets, and Rivers within the Premisses, and the Fish therein taken, together with the Royalty of the Sea upon the Coasts within the Limits aforesaid, and all Mines Royal, as well discovered as not discovered, of Gold, Silver, Gems, and precious Stones, to be found or discovered within the Territories, Limits, and Places aforesaid * * * AND FURTHER [we create] the Said Governor and Company for the Time being, and their Successors, the true and absolute Lords and Proprietors of the same Territory, Limits, and Places aforesaid.

Without quoting further, the charter granted to the company all the powers of government, both civil and criminal according to the laws of England, the right to employ armed force, to appoint commanders, and to erect forts. All these rights and powers granted to the company by the charter were held until 1869, when a large part of them were ceded to the Canadian Government on agreed terms.

From this it will be seen that the Hudson's Bay Company was a most important commercial and political factor in the development of the western frontiers and was consequently a strong influence upon the final agreement as to the location of the International Boundary west of Lake of the Woods.

At the time the Hudson's Bay Company was organized, 1670, Canada was in the possession of France. Therefore, the possessions of the Hudson's Bay Company were involved in the several disputes and wars between Great Britain and France regarding territorial possessions prior to the cession of Canada to England. Consequently, attempts had been made to define the boundaries of the Hudson's Bay Company's possessions in the Treaty of Ryswick in 1697 and again in the Treaty of Utrecht in 1713.

The Treaty of Ryswick of 1697 provided for the appointment of commissioners to determine the boundary between the possessions of France and those of Great Britain in the area around Hudson Bay but apparently without definite result.

The Treaty of Utrecht of 1713 provided for the appointment of commissioners for the same purpose. In 1714 the Hudson's Bay Company made representations to the Lords of Trade regarding the area in which it might trade, urging that the boundary be fixed as follows: "* * from the said lake (Mistassini) a line to run southwestward into 49 degrees north latitude * * * and that that latitude be the limit; that the French do not come to the north of it nor the English to the south

of it." The British commissioners under the Treaty of Utrecht were instructed to endeavor to get the limits claimed by the Hudson's Bay Company but that "the said boundaries be understood to regard the trade of the Hudson's Bay Company only; that His Majesty does not thereby recede from the right to any lands in America, not comprized within the said boundaries and that no pretention be thereby given to the French to claim any tracts of land in America, southward or southwest of the said boundaries."

Although the commissioners under the Treaty of Utrecht failed to reach any agreement, certain British geographers of the time adopted the contention that the 49th parallel should be the southern boundary of the Hudson's Bay Company's territories and so stated it on their maps. It seems probable that this is the origin of the erroneous impression which came to be generally accepted that the commissioners under the Treaty of Utrecht had fixed the 49th parallel as the southern boundary of British territory.

When negotiations between the Government of the United States and that of Great Britain were undertaken respecting the northern boundary of Louisiana, the United States claimed that the line of the 49th degree of north latitude was the northern boundary, on the grounds that this parallel had supposedly been adopted and definitely settled by commissioners appointed under the Treaty of Utrecht in 1713 as the dividing line between the French possessions of Western Canada and Louisiana on the south and the British territories of the Hudson's Bay Company on the north, and that since this treaty had been specifically confirmed in the treaty of 1763 by which Canada and that part of Louisiana east of the Mississippi were ceded to Great Britain, the remainder of Louisiana continued as before, bounded on the north by the 49th parallel.

Greenhow says in regard to this claim: 2

This conclusion would be undeniable if the premises on which it is founded were correct. The tenth article of the treaty of Utrecht does certainly stipulate that commissaries should be appointed by the governments of Great Britain and France respectively, to determine the line of separation between their possessions in the northern part of America above specified; and there is reason to believe that persons were commissioned for that object; but there is no evidence which can be admitted as establishing the fact that a line running along the 49th parallel of latitude, or any other line, was ever adopted, or even proposed, by those commissaries, or by their governments, as the limit of any part of the French possessions on the north and of the British Hudson's Bay territories on the south.

It is true that, on some maps of Northern America, published in the middle of the last [18th] century, a line drawn along the 49th parallel does appear as a part of the boundary between the French possessions and the Hudson's Bay territories, as settled according to the treaty of Utrecht: but, on other maps, which are deservedly held in higher estimation, a different line, following the course of the Highlands encircling Hudson's Bay, [drainage] is presented as the limit of the Hudson's Bay territory, agreeably to the same treaty; and, in other maps again, enjoying equal, if not greater, consideration, as having been published under the immediate direction of the British government, no line separating those British possessions from Louisiana or Canada is to be seen. * * *

The belief, nevertheless, that the 49th parallel of latitude was fixed, by commissaries [of Great Britain and France] appointed agreeably to the provisions of the treaty of Utrecht, as the

² Greenhow; Oregon and California.—Boston, 1844.

northern limit of Louisiana and Western Canada, has been hitherto universally entertained without suspicion in the United States, and has formed the basis of most important treaties.

During the negotiations between the United States and Great Britain respecting this boundary, no attempt was made by Great Britain to dispute the assertions of the United States concerning this supposed 49th parallel boundary line, and eventually that line was agreed upon by the treaty, as far west as "The Stony Mountains", as related in appendix II of this report.

The development of claims to territory west of the Stony, or Rocky, Mountains which influenced the final location of the boundary from the summit of the Rocky Mountains to the Pacific Ocean has its own distinctive historical background.

The earliest explorations of the North Pacific coast were predominantly Spanish. This was possibly due to the fact that Spain early took possession of and colonized the Pacific coast of northern South America and of the narrow southern part of North America and thus established ports on the Pacific from which to operate, while the other European nations, without such bases of operation, were compelled to make the long voyage around Cape Horn to reach the North Pacific.

Bartolome Ferrelo probably was the first explorer to sight the Pacific coast north of latitude 42°. He started out under Juan Rodriguez Cabrillo on an expedition sent by the Viceroy of Mexico "to examine the western coast of California as far north as possible and to seek for rich countries and passages toward the Atlantic." He succeeded to the command of the expedition upon the death of Cabrillo, from accident and disease, in the winter of 1542–43. Continuing the work of his predecessor, Ferrelo reached a point on the coast in latitude 43° in March 1543. In June 1579 Sir Francis Drake, an Englishman, in quest of a northern passage to the Atlantic, sighted the coast somewhere between latitudes 42° and 48°. In 1592 the Greek pilot, Juan de Fuca, in the employ of Spain, sailed from Acapulco, Mexico, and probably entered Puget Sound through the strait that now bears his In 1602 the Viceroy of Mexico, acting under orders from the Spanish King, sent three ships under the command of Sebastian Vizcaino to make a survey of the west This expedition was conducted in a very efficient manner and a careful survey was made of the coast as far north as latitude 43°. Upon the information gathered by this survey were founded the first approximately correct maps of that coast.

Then followed a period of about 170 years during which this part of the west coast of North America seems to have been forgotten or at least neglected by the civilized world. Following this period the Spaniards, operating from Mexico, were again the first to take up the exploration of the coast, this time with a decided purpose of possession.

The first of these exploring expeditions was conducted by Juan Perez in 1774, sailing under the directions of the Viceroy of Mexico with instructions to sail northward to the 60th degree of latitude and then to survey the coasts of America southward, taking possession for the King of Spain of every place at which he might land. He sailed northward to about latitude 54° where he sighted land and a high promontory which he named Cape Santa Margareta (now Cape Knox, on the north end of Graham Island). Then proceeding southward along the coast he entered a deep bay in what is now Vancouver Island, in about latitude 49°30′, where he remained for

some time trading with the natives. This bay, which he named San Lorenzo, was visited four years later by the English captain, James Cook, and named St. George's Bay, or Nootka Sound. Perez returned to Mexico within the year.

In 1775 Bruno Heceta, with Perez as ensign, in the ship Santiago, accompanied by the small schooner Sonora in command of Lieutenant Juan Francisco de la Bodega y Quadra, set out from Monterey under instructions from the Viceroy of Mexico to explore the coast as far north as latitude 65°. Sailing northward, they anchored in a small roadstead in latitude 41°10′ where they took possession of the country in the name of the King of Spain. From there they continued north and again sighted land in latitude 48°27′. They then examined the coast southward to latitude 47°20′. Near here seven men sent ashore in a small boat were massacred by the natives.

Going northward again, the two vessels were separated in a storm. Heceta then headed back for Monterey. On his way southward he sighted land in about 50° of latitude, again near the 48th parallel, and in latitude 46°17′ where he came to an opening in the shore from which came so strong a current that he was unable to enter it. This was doubtless the Columbia River.

Bodega, on the other hand, continued northward with the intention of reaching the 65th parallel according to instructions. In latitude 56° he sighted a lofty snow-capped mountain which he called San Jacinto (now Mount Edgecumbe). He went ashore near here and took possession of the country with the usual formalities. He continued his voyage up the coast as far as the 58th parallel before he started homeward.

In 1779 Bodega was back on the northwest coast with Ignacio Arteago and two ships. On this voyage, while in search of a passage to the Atlantic, they entered a great bay (the present Prince William Sound) containing many islands, and on the western side of the largest island (now Montague Island), they found a good harbor where they cast anchor and took possession of the region for the King of Spain. They gave the harbor the name of Port Santiago. The expedition soon returned to Mexico without having accomplished much in the way of new discoveries.

In the meantime, the coast had again been visited by an English navigator. In 1776 Captain Cook was instructed by the British Government to proceed to the Pacific coast of North America in about latitude 45° and then sail northward along the coast to latitude 65°, where he was to begin "search for such rivers or inlets as might be of considerable extent, and pointing toward Hudson's or Baffin's Bay." Should he find a passage of that description he was to endeavor to sail through it; if, however, he was satisfied there was no such passage sufficient for the purposes of navigation, he was to repair to the Russian establishments in Kamchatka and to explore the seas north of them in further search of a northeast passage from the Pacific Ocean to the Atlantic or North Sea.

Accordingly, he sailed from England in July 1776 in the ship *Resolution*, accompanied by Captain Charles Clerke in the ship *Discovery*. After spending more than a year in the South Pacific he finally reached his main objective on the west coast in 1778. He first saw land in the vicinity of latitude 44°. He did not again see the coast until he sighted a promontory in latitude 48° which he called Cape Flattery.

Cook attempted to find the strait through which Juan de Fuca had sailed in 1592, but concluded from his observations that no such opening existed. He cruised farther northward along the coast and entered the bay that Perez had entered four years before and named Port San Lorenzo. He sailed up the bay about 10 miles and anchored in a commodious harbor (Friendly Cove), where he refitted his vessels and traded with the natives.

Sailing northward from this bay Cook sighted land in about latitude 55° and made a careful examination of the coast from that point to latitude 57°, where he sighted the cone-shaped lofty mountain peak which Bodega had named Mount San Jacinto. Cook called it Mount Edgecumbe, the name it now bears. Continuing, he sighted a wide opening in the coast which he named Cross Sound and sighted a high mountain which he named Mount Fairweather. He also sighted Mount St. Elias. He entered and named Prince William Sound and also entered what is now known as Cook Inlet, which at first seemed to promise him a passage to the Arctic Sea. He sailed through Bering Sea and on through Bering Strait to latitude 70°41′, where he found his passage barred by a wall of ice rising 12 feet above the water and extending as far as the eye could reach. The farthest point visible on the American shore (on the extreme northwestern part of Alaska) he called Icy Cape. Altogether, Cook made an almost continuous survey of the northwest coast of the continent, and the report of his expedition was a material addition to geographic knowledge.

Up to this time there seems to have been but little or no effort made by the exploring expeditions, either the Spanish or the English, to settle or colonize the coasts they explored or to establish and carry on a fur trade with the Indians; but during the next decade such efforts were begun by both the Spanish and the English and shortly afterward by citizens of the United States. In the meantime, almost unknown to the rest of the European nations, until the voyage of Captain Cook, the Russians had been exploring the Alaskan coast from the north and the west and had been establishing settlements for carrying on fur trade with the Indians.

Some adventurous English captains, without license from the British Government and sailing under the Portuguese flag, traded along the coast. Among them were James Hanna, who visited Nootka Sound and traded with the Indians in 1785, and James Hearne, who made a similar voyage in 1786.

In 1786 La Perouse, a distinguished French navigator, visited this coast. Sent out by the French Government in 1785 to explore the Pacific coast north of latitude 55°, he spent considerable time in 1786 in the bay at the foot of Mount Fairweather. This bay he named Port des Français, now Lituya Bay. From there he sailed southward to the Queen Charlotte Islands, which he suspected to be separated from the mainland, although he did not prove it.

In the same year, 1786, an association of British merchants, resident in the East Indies, was organized under the name of the East India Company with the view of opening a trade to the northwest coast of America for the purpose of supplying the Chinese market with furs. To this end they secured a license and began operations. They sent out Captains Lowrie and Guise in two small vessels from Bombay and Captains Meares and Tipping in two smaller vessels from Calcutta. Lowrie and Guise went to Nootka Sound and thence northwest along the coast to Prince

William Sound and returned. Meares and Tipping sailed to the Aleutian Islands and thence to Prince William Sound. Tipping and his vessel were probably lost. Meares spent the winter of 1786–87 in Prince William Sound, where more than half his crew died from want and scurvy.

Captains Portlock and Dixon, in command of the ships King George and Queen Charlotte, owned by the King George's Sound Company and sailing under a license granted by the South Sea Company, visited the coast in 1786 and 1787. Dixon sailed to the eastward, sighted Mount San Jacinto (Mount Edgecumbe) and visited the inlet on the south side of the mountain, which had been called Port Remedios, but to which he gave the name Norfolk Sound. He also explored the entrance which now bears his name and decided that the land to the south was an island, to which he gave the name Queen Charlotte Island (now Graham Island, of the Queen Charlotte group).

In 1787 two other fur-trading vessels of the King George's Sound Company, the *Princess Royal*, commanded by Captain Duncan, and the *Prince of Wales*, under Captain Colnett, reached the northwest coast. Duncan is credited with definitely ascertaining that the Queen Charlotte Islands are separated from the mainland.

Captain Berkeley, an Englishman, sailing and trading in the *Imperial Eagle* under the flag of the Austrian East India Company in 1787, noted a wide entrance in the coast between latitudes 48° and 49° which was doubtless the same inlet the old Greek pilot Juan de Fuca reported having discovered in 1592. Berkeley did not explore the passage but sailed southwest along that portion of the coast which had not been visited by vessels since Cook's voyage 10 years before. The crew of a boat which he sent ashore were murdered by the Indians in much the same manner and near the same place where the Spaniards of Bodega's crew were massacred in 1775. Berkeley named the island just north of this place Destruction Island, which name it now bears. Bodega had named it Isla de Dolores.

In 1788 two vessels, the Felice and the Iphigenia, sailed from the Portuguese port of Macao, China, on a trading expedition to the northwest coast. They were under the direction of John Meares and William Douglas. Meares was a lieutenant retired from the British Navy, whose former voyage has already been mentioned, and who published an elaborate narrative of his expeditions. The vessels were ostensibly commanded by Portuguese captains and sailed under the Portuguese flag. This expedition is of special interest as the circumstances connected with it led to the first dispute and the first treaty between civilized nations relative to this part of the world. The dispute reached grave and ominous proportions before it was finally settled by treaties or conventions, and the conventions themselves had a far reaching effect, as through them Great Britain based a claim to the acquirement of rights of possession from Spain.

The two vessels sailed to Nootka Sound, where the construction of a small vessel was begun. Meares, desiring to make an exploring and trading trip while the ship-building was in progress, arranged with the Indian chief Maquinna for land upon which to erect a house to accommodate the men engaged in constructing the ship. The house was finished and a cannon placed to command the cove and Nootka

village. Captain Douglas left in the *Iphigenia* on a trading trip to the north and Lieutenant Meares sailed south in the *Felice*.

Meares on his southward voyage entered the opening previously sighted and reported by Berkeley, in latitude 48° 39′. He sent a boat up the inlet for some distance. Upon its return the crew reported that they had proceeded some 30 leagues to a point where the inlet appeared to be some 15 leagues across, and that they had a skirmish with the natives in which some of the men had been injured. Meares gave the inlet the name "Straits of Juan de Fuca."

Meares continued south along the coast and searched for an opening shown on the Spanish charts as River San Roque at about latitude 46°, which had been reported by Heceta in 1775. Near this latitude he sighted a promontory and a small bay, but on attempting to enter the bay encountered shoal waters and breakers ahead of the ship, and so failing to find a channel was compelled to withdraw. He named the promontory Cape Disappointment and the bay Deception Bay. He decided that no River San Roque existed as laid down on the Spanish charts and returned to Nootka Sound. On the way back he visited two large bays situated a little northwest of Juan de Fuca Strait, which were called by the natives Clyoquot and Nitenat. He named these bays Port Cox and Port Effingham.

Shortly after Meares returned to Nootka, Captain Douglas arrived from Cook's River (Cook Inlet) with the ship *Iphigenia* loaded with furs. Plans were made to take the furs in the *Felice* to Macao and for the *Iphigenia* and the *Northwest America*, the new vessel which by this time had been completed, to sail to the Sandwich Islands for the winter.

Before their departure, however, two American vessels arrived, the Columbia, in command of John Kendrick, and the Washington, in command of Robert Gray. These ships had sailed from Boston under the American flag and with American papers. The vessels left Boston together in the summer of 1787. After reaching the Pacific they were separated in a violent gale. The Washington continued northward toward Nootka Sound, the rendezvous agreed upon, and after sighting land several times in about latitude 46°, entered and anchored in a harbor which Gray thought was probably the mouth of the "Great River of the West." The historian Greenhow states that this was probably the mouth of the Columbia River. Differing therefrom, the historian Bancroft states that it was doubtless Tillamook Bay.

At first the natives were friendly, exchanging berries and skins for iron implements, but before the ship left, the men who were sent ashore, although received in the most friendly manner, were later attacked. One of the crew was killed and others were seriously wounded before the boat could regain the vessel. The natives could be kept from boarding the ship only by use of the swivel gun. Gray named this anchorage Murderers Harbor. From there he sailed northward along the coast, failing, however, to note the entrance to Juan de Fuca Strait, and arrived at Nootka Sound in September 1788, where he was aided in entering the harbor by boats from the Felice and the Iphigenia.

The Columbia, from which Gray had been separated by the storm, had put in for repairs at the harbor of the Isle San Juan de Fernandez, off the coast of Chile. Here Kendrick was treated very kindly and assisted in every way in refitting his

vessel by the commandant of the Spanish garrison, Don Blas Gonzalez. After repairs were made, Kendrick continued his voyage and arrived at Nootka Sound a week behind Gray.

Shortly after the arrival of the *Columbia*, Meares left in the *Felice* for China, and in the latter part of October the *Iphigenia* and the *Northwest America* sailed for the Sandwich Islands. The *Columbia* and *Washington* wintered at Nootka, Kendrick and Gray carrying on trade with the Indians.

The Spanish Government became considerably alarmed upon learning of the appearance in the Pacific of a trading vessel flying the American flag and was so displeased with Commandant Gonzalez, for the hospitable treatment he accorded Captain Kendrick, that he was cashiered for remissness.

However, the chief danger to Spanish sovereignty on the Pacific coast appeared to be from the encroachment of the Russians from the north. From the narrative of Cook's expeditions and other recently published works, enough had been learned of the Russian commerce and establishments on the northwest coast to cause the Spaniards to seek first-hand information. In 1788 the Viceroy of Mexico sent out two vessels, the *Princesa* under Estevan Jose Martinez and the schooner *San Carlos* under Gonzalo Lopez de Haro, on an expedition of inquiry, to make an examination of the Russian establishments and posts on the Pacific coast of America, and after the completion of this, to explore the coast southward to California, and particularly to such places convenient for the establishment of Spanish colonies.

On his return Martinez reported eight Russian establishments, all situated east of Prince William Sound; also that two Russian vessels had been sent to found a settlement at Nootka Sound. When this report reached Madrid, remonstrance against such encroachments were addressed by Charles IV, the Spanish sovereign, to Catherine II, the Empress of Russia. The Empress' reply was that orders had been given her subjects to make no settlements in the country belonging to other nations.

Early in 1789, pursuant to the aggressive policy adopted by the Spanish Government, the Viceroy of Mexico again sent out Martinez and Haro, this time to take possession of Nootka in the name of the Spanish sovereign, and directed them "should any Russian or British vessels appear at Nootka, to receive them civilly but at the same time to declare the paramount rights of His Catholic Majesty to that place and the adjacent coasts."

Martinez and Haro arrived at Nootka on May 5, 1789, with well-manned and well-equipped vessels. They found the *Iphigenia* at anchor in Friendly Cove and the *Columbia* at Mawhinna, a few miles farther up. The *Iphigenia* and the *Northwest America* had arrived on April 20 from the Sandwich Islands, where they had wintered. The *Northwest America* had sailed on a trading expedition on April 28 and thus was absent when Martinez arrived.

Martinez immediately notified the commanders of the *Iphigenia* and the *Columbia* that he intended to maintain possession of Nootka as a Spanish port and demanded that they show their papers. As the *Iphigenia* was badly in need of supplies and equipment, her commander prevailed upon Martinez to furnish the necessary articles and to take in payment therefor bills drawn on the Portuguese

merchant Juan Cavallo, whose name appeared on the ship's papers as owner. This, however, was no concession on the part of Martinez, for a few days later he seized the vessel with her cargo and placed her Portuguese captain, Viana, and her supercargo, Douglas, under arrest, giving as excuse that their papers were defective. In order to effect their release and the restoration of the vessel and cargo they were compelled to sign an agreement to pay the full value of the vessel and cargo upon demand should the Viceroy of Mexico declare the seizure lawful. The *Iphigenia*, upon her release, lost no time in getting away from Nootka and eventually arrived in Macao with a valuable cargo of furs. Shortly after the *Iphigenia*'s departure from Nootka, the *Northwest America* returned from her trading expedition along the coast with more than 200 sea-otter skins. She was immediately seized by Martinez.

In the meantime, Meares, upon reaching Macao in the Felice, found that John Cavallo, the registered owner, had become bankrupt. Following the bankruptcy the real owners or creditors and the King George's Sound Company entered into agreements to unite their interests, and pursuant thereto the Felice was sold and the Argonaut purchased. The Argonaut, under Captain Colnett, and the Princess Royal, under Captain Hudson, under licenses from the East India Company and the South Sea Company, were thereupon dispatched to form a permanent settlement on the northwest coast of America, to be under the direction of Captain Colnett. The Princess Royal arrived at Nootka just a few days after the seizure of the Northwest America.

Martinez, on being informed by Captain Hudson of Cavallo's bankruptcy, announced that he would hold the *Northwest America* for the amount of the bills drawn by the commander of the *Iphigenia*, and she was immediately equipped and sent out on a trading expedition under one of the mates of the *Columbia*.

The officers and crew of the *Princess Royal* had been received and treated with courtesy and respect by Martinez, but when Captain Colnett arrived in the *Argonaut* a little later he was not so fortunate. Although Captain Colnett had been informed by the officers of the *Northwest America* and the *Columbia* of what had happened at Nootka, he was persuaded by Martinez to enter the sound and accepted an invitation on board Martinez's ship to exhibit his papers. During the interview Colnett informed Martinez of his intention to take possession of Nootka and erect a fort under the British flag. Martinez's reply to this was that the place was already occupied by Spanish forces in the name of His Catholic Majesty. This was followed up by the immediate arrest and confinement of Colnett and the seizure of the *Argonaut*, and eventually by the seizure of the *Princess Royal*.

After her cargo was transferred to the Spanish ships, the Argonaut, manned by a Spanish crew, with Colnett and his men on board as prisoners, was sent to San Blas, Mexico, where she arrived on August 16, 1789. Colnett and his men were kept prisoners for some months but were eventually released and the Argonaut and the Princess Royal were restored under the condition that the ships were not to enter any place on the Spanish-American coast for the purpose of settlement or trade with the natives.

Upon his release Colnett refitted the Argonaut at San Blas and with the survivors of his crew sailed for Nootka to take possession of the Princess Royal. Arriving at Nootka, he found the place deserted, Martinez having sailed for Mexico sometime in November. Colnett continued on to Macao, China, where he arrived in the latter part of 1790. The Princess Royal was later returned to him by Lieutenant Quimper under whose command she had been employed in the service of Spain for more than two years. On one of the trips made by Quimper in the Princess Royal he entered Juan de Fuca Strait and examined the shores for a hundred miles.

The officers and crew of the *Northwest America*, which had been seized and held for security of debt, and some of the men from the *Argonaut* and *Princess Royal* had been sent to China as passengers on the *Columbia*, payment for their passage and wages being made out of the otter skins taken from the *Princess Royal* by Martinez.

The incidents just described created a serious controversy between the Governments of Great Britain and Spain, even though the ships seized had been restored and Spain had expressed a willingness to make reparations for the seizures. The matter was finally adjusted by the convention known as the Nootka Treaty, signed October 28, 1790, which reads as follows:

ARTICLE I. The buildings and tracts of land situated on the northwest coast of the continent of North America, or on the islands adjacent to that continent, of which the subjects of his Britannic majesty were dispossessed about the month of April, 1789, by a Spanish officer, shall be restored to the said British subjects.

ARTICLE II. A just reparation shall be made, according to the nature of the case, for all acts of violence or hostility which may have been committed subsequent to the month of April, 1789, by the subjects of either of the contracting parties against the subjects of the other; and, in case any of the said respective subjects shall, since the same period, have been forcibly dispossessed of their lands, buildings, vessels, merchandise, and other property, whatever, on the said continent, or on the seas and islands adjacent, they shall be reestablished in the possession thereof, or a just compensation shall be made to them for the losses which they have sustained.

ARTICLE III. In order to strengthen the bonds of friendship and to preserve in future a perfect harmony and good understanding, between the two contracting parties, it is agreed that their respective subjects shall not be disturbed or molested, either in navigating, or carrying on their fisheries, in the Pacific Ocean or in the South Seas, or in landing on the coasts of those seas in places not already occupied, for the purpose of carrying on their commerce with the natives of the country, or of making settlements there; the whole subject, nevertheless, to the restrictions specified in the three following articles.

ARTICLE IV. His Britannic majesty engages to take the most effectual measures to prevent the navigation and the fishery of his subjects in the Pacific Ocean or in the South Seas from being made a pretext for illicit trade with the Spanish settlements; and, with this view, it is moreover expressly stipulated that British subjects shall not navigate, or carry on their fishery, in the said seas, within the space of ten sea leagues from any part of the coasts already occupied by Spain.

ARTICLE V. As well in the places which are to be restored to the British subjects, by virtue of the first article, as in all other parts of the northwestern coasts of North America, or of the islands adjacent, situate to the north of the parts of the said coast already occupied by Spain, wherever the subjects of either of the two powers shall have made settlements since the month of April, 1789, or shall hereafter make any, the subjects of the other shall have free access, and shall carry on their trade without any disturbance or molestation.

ARTICLE VI. With respect to the eastern and western coasts of South America, and to the islands adjacent, no settlement shall be formed hereafter by the respective subjects in such

parts of those coasts as are situated to the south of those parts of the same coasts, and of the islands adjacent, which are already occupied by Spain: provided, that the said respective subjects shall retain the liberty of landing on the coasts and islands so situated for the purpose of their fishery, and of erecting thereon huts and other temporary buildings serving only for those purposes.

ARTICLE VII. In all cases of complaint or infraction of the articles of the present convention, the officers of either party, without permitting themselves to commit any violence or act of force, shall be bound to make an exact report of the affair and of its circumstances to their

respective courts, who shall terminate such differences in an amicable manner.

In addition to the 7 articles quoted there was a secret article attached to the convention, which provided that the 6th article should remain in force only as long as no other "establishment shall be formed by any other power" on the said coasts.

Great Britain later appointed Captain George Vancouver and Spain appointed Captain Juan Francisco de la Bodega y Quadra as commissioners to carry out the second article of this convention. They were to meet at Nootka and determine what lands and buildings were to be returned to the British claimants. Vancouver sailed from England in January 1791 in the *Discovery*, accompanied by the *Chatham* under the command of Lieutenant Broughton. Instructions for his conduct as commissioner followed him in the storeship *Dadalus*.

Vancouver and Bodega failed to arrive at an agreement respecting the settlement of claims and the repossession of land. Thereupon, the two Governments entered into a second convention signed February 12, 1793, which set forth the amount of the indemnity which Spain should pay. A third convention was signed January 11, 1794, which provided for the restoration of the land British subjects had been dispossessed of, and the mutual withdrawal from "the said Port of Nootka". The method of procedure was fully set forth in the convention, leaving nothing to the judgment of the commissioners authorized to carry it out. The formal procedure of restoration was carried out at Nootka on March 28, 1795, by Thomas Pearce, First Lieutenant in His Majesty's Marine Forces, for Great Britain, and Brigadier General Jose Manuel de Alva for Spain. During the summer of 1795 the Spanish forces evacuated Nootka in accordance with the terms of the convention. Neither the Spanish nor the English occupied the Port of Nootka thereafter.

The existence of the second and third conventions was unknown in the United States until after the question of boundary had been settled by the Oregon Treaty in 1846.

Going back to the activities of American traders: In the spring and summer of 1789, Captain Gray in the Washington traded along the coast north and south of Nootka. On one of these trading expeditions he made an exploration of the whole east coast of the Queen Charlotte Islands, and on a subsequent cruise entered Juan de Fuca Strait and sailed up the inlet for 50 miles in an east-southeast direction, noting that the width of the strait at that distance from the Pacific was about 5 leagues.

On his way back to Nootka with the Washington, Gray met the Columbia just starting for Canton, China, with the crew of the Northwest America aboard. Gray and Kendrick transferred commands; Gray proceeded to China in the Columbia and Kendrick with the Washington remained on the Pacific coast. Gray landed

the passengers and disposed of the furs in China and then sailed for Boston, where he arrived August 10, 1790, having carried the flag of the United States around the world for the first time.

After parting with Gray, Kendrick sailed through Juan de Fuca Strait, trading with the natives, and returned to the Pacific through a northern passage.

In September 1790, four United States ships sailed from Boston and one from New York for trade on the Pacific coast. Among them were the brig *Hope*, in command of Captain Ingraham, and the *Columbia* in command of Captain Gray. Gray arrived at Clyoquot, just north of the entrance to Juan de Fuca Strait, in June 1791 and proceeded thence to the east coast of the Queen Charlotte Islands where he remained until September examining the coasts of the islands and the mainland between latitudes 54° and 56°, and trading with the natives. He entered an inlet in latitude 54°23′ (probably the present Portland Canal), which he explored for a hundred miles to the northeast without reaching its termination.

Gray returned to Clyoquot and built a fortified habitation which he called Fort Defiance, in which he lived until the following spring. During the winter he built a small vessel, the *Adventure*, which in April sailed to Queen Charlotte Sound under the command of Haswell, first mate of the *Columbia*.

Vancouver and Broughton reached the Pacific coast in the spring of 1792. In addition to his duties as commissioner under the provisions of the Nootka Treaty, Vancouver had been instructed to examine the Pacific shores of the American Continent between the 35th and 60th parallels of latitude. They were off Cape Mendocino on the northern California coast in April 1792, and from there cruised northward, examining the coast for any bays or inlets. They noted the discoloration of the water in Deception Bay, named by Meares in 1789 and reported by him to be in latitude 46°10′. Like Meares, they found shoal water and breakers and did not enter the bay. Continuing northward, Vancouver and Broughton met the Columbia in command of Gray on April 29. Gray informed Vancouver that he also had been off the mouth of a river in latitude 46°10′ but that the current and breakers had prevented his entering it.

Gray had sailed from Fort Defiance early in April and on his way southward had entered a well-sheltered bay which he named Bulfinch Harbor (now Grays Harbor). Here he remained three days trading with the natives. Continuing southward to Deception Bay, he succeeded in crossing the bar between breakers on May 11, 1792, and found himself to be in a large fresh-water river which he named Columbia in honor of his ship. In the course of the next few days he proceeded up the river some 20 miles and on May 20 recrossed the bar into the Pacific. From the mouth of the Columbia, Gray sailed to the east coast of the Queen Charlotte Islands where his ship struck and was badly damaged. After some difficulty he succeeded in getting his ship to Nootka for repairs. Here he communicated his discovery of the Columbia River to Captain Ingraham of the brig *Hope* from Boston, and to Captain Bodega y Quadra, the Spanish Commissioner. He also furnished Bodega y Quadra a chart of Bulfinch Harbor and the mouth of the Columbia.

Vancouver and Broughton after parting with Gray entered Juan de Fuca Strait and made extensive explorations. They explored and named Port Discovery, Admiralty Inlet, Hood Canal, Puget Sound, and Possession Sound.

Returning to Juan de Fuca Strait, Vancouver and Broughton continued explorations of the inland waters to the northward. They unexpectedly encountered the Spanish schooners Sutil and Mexicana commanded by Galiano and Valdez. After exchanging information the British and Spanish commanders continued explorations jointly for some weeks to the northward. Vancouver and Broughton eventually reached Queen Charlotte Sound through inland passages and on August 10 emerged into the Pacific and sailed to Nootka. At Nootka Vancouver and the Spanish Commissioner Bodega together compared the notes and charts of the voyages of the English and Spanish through Juan de Fuca Strait and the inland waterways, and agreed to call the great island around which they had sailed the Island of Quadra and Vancouver. Having both received their instructions for conduct as commissioners under the Nootka Treaty they also conferred upon the manner in which the terms of the treaty were to be carried out, but without agreement at the time.

Vancouver then went to Bulfinch Harbor and the Columbia River with the intention of making a thorough examination of each. His ship was unable to cross the bar at the entrance to the Columbia, but Broughton in the *Chatham* succeeded in crossing and went some 12 miles up the river and anchored, and from there explored the river by cutter and launch for some 90 to 100 miles, or as far as Vancouver's Point. Vancouver and Broughton then cruised south along the coast as far as Monterey and thence to the Sandwich Islands for the winter. Vancouver spent the two following summers, 1793 and 1794, in further exploration and charting of the northwest coast. These explorations extended from San Diego in latitude 33° to the Alaska peninsula and Cook Inlet in latitude 60°. Vancouver then concluded that his task was completed and returned to England.

Russia continued her explorations and settlements along the northwest coast. Although her most important operations were north of the 56th parallel, in 1812, Count Romanzoff, by permission of the Governor of California, established a post on the California coast near Bodega Bay just north of San Francisco, ostensibly for the purpose of forming an agricultural establishment for furnishing supplies to the northern posts. The settlement was abandoned in 1841, having been sold to John A. Sutter, the discoverer of gold in California, for \$30,000.

EXPLORATIONS OF THE INTERIOR

In 1788 the North West Company, owned and operated by British citizens, established the trading post Fort Chipewyan on the southwest shore of Athabaska Lake in latitude 59°, about midway between Hudson Bay and the Pacific Ocean. In 1792 a party in charge of Alexander Mackenzie left Fort Chipewyan, ascended Peace River, and wintered in the foothills of the Rocky Mountains. Early in June the following year they continued the ascent of Peace River to its source, crossed the watershed to the Fraser River, and descended it for some 250 miles. Then, abandoning canoes, they traveled westward some 200 miles and reached the west coast on July 22, 1793, at the mouth of an inlet in latitude 52°20′ which Vancouver had surveyed a few weeks earlier and named Cascade Canal (Cascade Inlet). Mac-

kenzie's party had thus accomplished the first passage across the continent in northern latitudes, almost exactly 300 years after the voyage of discovery by Columbus. Their purpose accomplished, the party retraced their way to Fort Chipewyan.

As has been noted, the Louisiana Purchase in 1803 extended the territory of the United States westward from the Mississippi River to the Rocky Mountains. For the purpose of exploring this acquired territory and finding a practicable route to the Pacific Ocean, Captains Meriwether Lewis and William Clark were commissioned by President Jefferson in 1803 "to explore the River Missouri and its principal branches to their sources, and then to seek and trace to its termination in the Pacific some stream which might offer the most direct and practicable water communication across the continent for the purpose of commerce." On May 14, 1804, Lewis and Clark started up the Missouri River with a party of 28 men. By the end of November they had covered about 1,600 miles and gone as far as latitude 47°21' where they passed the winter among the Mandan Indians. Early in April 1805 they resumed their journey and continued the ascent of the Missouri; they reached the Great Falls of the Missouri in July.

Above the falls they found the river divided into three main branches which they named the Jefferson, the Gallatin, and the Madison. The Jefferson was followed to its source in the southwestern part of the present State of Montana. The party then proceeded overland across the Rocky Mountains and northward to the waters of the southern tributary of the Columbia, now known as Snake River. Embarking on these waters they descended to the mouth of the Columbia which they reached on November 15, 1805.

The party passed the winter at what they called Fort Clatsop, a dwelling they constructed on the south bank near the mouth of the river. In March 1806 they started on their return journey. They followed the Columbia and its tributaries to where they had embarked on them the previous season and then crossed the Rocky Mountains. In preparing for the overland journey the party was divided. Captain Lewis, with a number of men, explored the Bitterroot and Marias Rivers on his way east, while Captain Clark, with his men, went south to the Jefferson, descended it to the mouth of the Gallatin, then crossed a divide to the Yellowstone and descended it to its mouth where he was soon joined by Lewis. Together they then descended the Missouri to St. Louis, where they arrived September 23, 1806.

In the meantime the British fur-trading companies were pushing westward. In 1805 the North West Company assigned to Simon Fraser the task of extending the operations of the company into the territory explored by Mackenzie. Late in that year he ascended the Peace River and built Rocky Mountain House at the eastern extremity of the portage across the Rocky Mountains.

In 1806 Fraser and John Stewart continued along Mackenzie's route to the junction of the Stewart River with the Fraser, ascended the Fraser to what is now called Stewart Lake, and established Fort James. They also began the erection of Fort Fraser on Fraser Lake. In 1807 they built Fort George on the Fraser River at the mouth of the Stewart, and in 1808 they explored the Fraser to tidewater.

In 1808 a United States association called the Missouri Fur Company established posts in the upper Mississippi and Missouri country and beyond the Rocky Moun-

tains. Mr. Henry of this company in 1808 established the first trading post on the waters of the Columbia on a branch of the Lewis (Snake) River. This post was abandoned in 1810 on account of Indian depredations and difficulty of access.

In 1810 Captain Smith of the American ship *Albatross* built a house and planted a garden at Oak Point on the south bank of the Columbia River 49 miles above its

mouth, but abandoned them the same year.

In 1810 John Jacob Astor, a citizen of the United States, organized the Pacific Fur Company which sent out a party from New York in the ship *Tonquin* to establish a trading post on the Columbia River near its mouth, and a little later dispatched another party overland for the same purpose. The party on the *Tonquin* entered the mouth of the Columbia in March 1811, landed on the south bank of the river about 10 miles from its mouth, at the point named Fort George by Broughton in 1792, and proceeded to erect a trading post which they christened Astoria. The detachment sent overland, delayed by mishaps, did not reach Astoria until January 1812.

In the meantime the North West Company had founded trading posts on the Kootenai and Flathead Rivers, tributaries of the Columbia, and in 1811 David Thompson of that company descended the northern branch of the Columbia and the main stream to Astoria, where he arrived in July. His party were the first white men to traverse the northern branch of the river. A party of Astorians accompanied David Thompson on his return up the river and established a trading post at the mouth of the Okanogan on the northern or main branch of the Columbia, some five or six hundred miles by river from the ocean. The following year, 1812, the Astorians established a trading post on the Spokane River, a tributary entering the Columbia approximately 100 miles above the Okanogan.

In 1813 the post at Astoria learned of the declaration of war by the United States against Great Britain, and therefore that the arrival of ships from the United States was not to be expected. A little later the post was visited by two representatives of the North West Company with a party of men who brought accounts of the early successes of Great Britain in the war. The officers of the Pacific Fur Company at Astoria rightly concluded that unless help came soon the company must be dissolved. Accordingly, in October 1813, no help having arrived and the likelihood of capture by the British appearing imminent, an agreement was made with the representatives of the North West Company by which all the establishments, furs, and stocks of goods in the Columbia River valley were sold to the North West Company for \$58,000. After this agreement had been signed and while the process of transfer was going on, the British warship Raccoon appeared at the mouth of the river and demanded the surrender of the post. This was formally complied with and then Captain Black of the Raccoon learned that the contents of the post had already become the property of British subjects by purchase. After the formalities of surrender the name of the post was changed back to Fort George.

The Treaty of Ghent, which terminated the war of 1812, stipulated that "All Territory, places, and possessions whatsoever, taken by either party from the other during the war, or which may be taken after signing this treaty, excepting only

the islands hereinafter mentioned [in the Bay of Fundy], shall be restored without delay * * *." Under this clause of the treaty, Astoria (Fort George) was formally restored to the United States on October 6, 1818.

Thus by the year 1818 both Great Britain and the United States had acquired on the Pacific Coast conflicting interests and claims overlying the already overlapping original claims of Spain and Russia, which had been based on discovery and occupation.

It was in 1818 that the United States and Great Britain finally agreed by treaty upon the boundary from Lake of the Woods to the "Stony Mountains" and at the same time, in article III of that treaty, agreed upon joint occupancy of "any country that may be claimed by either party on the northwest coast of America, westward of the Stony Mountains" without prejudice to the claims of either party or "the claims of any other Power or State."

During the period of "joint occupancy" provided for in the treaty of 1818,

much happened to affect the final location of this boundary.

The negotiations begun between the United States and Spain after the Louisiana Purchase, looking toward the settlement of their common boundaries, finally culminated in the treaty of 1819 by which Spain, for a consideration, ceded to the United States East and West Florida and all her rights to territory north of latitude 42° as far as the Pacific Ocean. Also, Russia relinquished by treaties with both the United States and Great Britain all her rights and claims to territory south of latitude 54°40′.

The Hudson's Bay Company took over the North West Company, greatly expanded the fur trade, exercised all the rights of commerce and government authorized by its charter, and became the chief advocate of Great Britain's territorial claims west of the Rocky Mountains.

The fertility of the Columbia River valley and its tributary valleys, the wealth of the forests, and the mild climate of the territory became known in the East, and a stream of American immigration set in. By 1841 the American settlers in the "Oregon territory" (as it had come to be known) had reached such numbers as to make some form of civil government necessary, and two years later, 1843, they organized a provisional government in the name of the United States. The American immigration continued to increase yearly, until in 1845 there were 3,000 actual settlers in this region, making the final settlement of the boundary question imperative.

A compromise of the conflicting claims was finally effected, and the boundary was agreed upon in the treaty between the United States and Great Britain signed June 15, 1846.

³ The use of the name "Oregon" for this region is credited to Jonathan Carver in 1766 and also to Major Robert Rogers in 1767. It finally came to be generally applied to the area lying between the Rocky Mountains and the Pacific Ocean and extending indefinitely northward from the 42d parallel of latitude. Later it was applied to a narrower area including the drainage of the Columbia River, and after the treaty of 1846 to the area of what is now the states of Oregon, Washington, Idaho, and western Montana and Wyoming.

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APPENDIX II

THE BOUNDARY TREATIES

The Provisional Treaty of Peace between the United States and Great Britain, concluded November 30, 1782, and the Definitive Treaty of Peace between the United States and Great Britain, concluded September 3, 1783, both provided in identical terms, in the second article of each treaty, that the northern boundary of the United States should run "Thence through the said Lake [Lake of the Woods] to the most Northwestern Point thereof, and from thence on a due West Course to the River Mississippi." The Mississippi was recognized as the western boundary of the United States in the next words of the two treaties: "Thence by a Line to be drawn along the Middle of the said River Mississippi until it shall intersect the Northernmost Part of the thirty first Degree of North Latitude." The text ¹ of article II reads as follows:

DEFINITIVE TREATY OF PEACE

(Signed September 3, 1783; ratifications exchanged May 12, 1784)

* * * * * * *

ARTICLE II

And that all Disputes which might arise in future on the Subject of the Boundaries of the said United States, may be prevented, it is hereby agreed and declared, that the following are and shall be their Boundaries, Viz. From the North West Angle of Nova Scotia, viz. That Angle which is formed by a Line drawn due North from the Source of Saint Croix River to the Highlands[,] along the said Highlands which divide those Rivers that empty themselves into the River St. Lawrence, from those which fall into the Atlantic Ocean, to the Northwestern-most Head of Connecticut River: Thence down along the middle of that River to the forty fifth Degree of North Latitude; From thence by a Line due West on said Latitude until it strikes the River Iroquois or Cataraquy; Thence along the middle of said River into Lake Ontario; through the Middle of said Lake until it strikes the Communication by Water between that Lake & Lake Erie; Thence along the middle of said Communication into Lake Erie; through the middle of said Lake, until it arrives at the Water Communication between that Lake & Lake Huron; Thence along the middle of said Water-Communication into the Lake Huron, thence through the middle of said Lake to the Water Communication between that Lake and Lake Superior, thence through Lake Superior Northward of the Isles Royal & Phelipeaux to the Long Lake; Thence through the Middle of said Long-Lake, and the Water Communication between it & the Lake of the Woods, to the said Lake of the Woods; Thence through the said Lake to the most Northwestern Point thereof, and from thence on a due West Course to the River Mississippi, Thence by a Line to be drawn along the Middle of the said River Mississippi until it shall intersect the Northernmost Part of the thirty first Degree of North Latitude. South, by a Line to be drawn due East from the Determination of the Line last mentioned, in the Latitude of thirty one Degrees North of the Equator to the middle of the River Apalachicola or Catahouche. Thence along the middle thereof to its Junction with the Flint River; Thence strait to the Head of St. Mary's River, and thence down along the middle of St Mary's River to the Atlantic Ocean. East, by a Line to be drawn along the Middle of the River St Croix, from its Mouth in the Bay of Fundy to its Source; and from its Source directly North to the aforesaid Highlands, which divide the

¹ The text of the treaties has been taken from Treaties and other International Acts of the United States of America, vols. 2–5, edited by Hunter Miller, Department of State, Washington; 1931–1937. This differs from other published texts only in unimportant details of punctuation, capitalization, division into paragraphs, and order of precedence.

Rivers that fall into the Atlantic Ocean, from those which fall into the River St. Lawrence; comprehending all Islands within twenty Leagues of any Part of the Shores of the United States, & lying between Lines to be drawn due East from the Points where the aforesaid Boundaries between Nova Scotia on the one Part and East Florida on the other, shall respectively touch the Bay of Fundy and the Atlantic Ocean, excepting such Islands as now are or heretofore have been within the Limits of the said Province of Nova Scotia.

It was supposed by the framers of the treaties that the source of the Mississippi was far enough north for a due west line drawn from the most northwestern point of Lake of the Woods to intersect that river. Knowledge to the contrary was possibly in the possession of trappers and fur traders operating in the region, but if so, such knowledge had not been set down on published maps, and the famous Mitchell map, which was one of the maps used by the framers of the treaties, while it does not delineate the source of the Mississippi, carries the following note: "The head of the Mississippi is not yet known. It is supposed to arise about the 50th degree of latitude."

It was not long until doubts arose in regard to the Mississippi's rising so far north and the uncertainty finds expression in article IV of the Jay Treaty concluded November 19, 1794, which reads:

THE JAY TREATY. TREATY OF AMITY, COMMERCE, AND NAVIGATION

(Concluded November 19, 1794; ratifications exchanged October 28, 1795)

ARTICLE IV

Whereas it is uncertain whether the River Mississippi extends so far to the Northward as to be intersected by a Line to be drawn due West from the Lake of the woods in the manner mentioned in the Treaty of Peace between His Majesty and the United States, it is agreed, that measures shall be taken in Concert between His Majesty's Government in America, and the Government of the United States, for making a joint Survey of the said River, from one Degree of Latitude below the falls of St Anthony, to the principal Source or Sources of the said River, and also of the parts adjacent thereto, And that if on the result of such Survey it should appear that the said River would not be intersected by such a Line as is above mentioned; The two Parties will thereupon proceed by amicable negotiation to regulate the Boundary Line in that quarter as well as all other Points to be adjusted between the said Parties, according to Justice and mutual Convenience, and in Conformity, to the Intent of the said Treaty.

The joint surveys provided for in the treaty were never made; but David Thompson, geographer for the North West Company (a fur-trading company) visited the source of the Mississippi in 1798 and made latitude observations which placed it far south of Lake of the Woods.

The fifth article of a convention regarding boundaries, negotiated by Lord Hawkesbury and Rufus King on May 12, 1803, provided, that in view of the uncertainty as to the extent of the Mississippi northward, the boundary should be the "shortest line" that could be drawn "between the northwest point of the Lake of the Woods and the nearest source of the River Mississippi."

This convention was never ratified. Before it was acted upon by the United States Senate the treaty between the United States and France of April 30, 1803, for the cession of Louisiana was confirmed.

The territory of Louisiana acquired by this treaty and by the convention of the same date extended the possessions of the United States westward beyond the Mississippi River and eliminated the question as to the source of the Mississippi by introducing the question of a territorial delimitation between the possessions of Great Britain and the Louisiana territory.

While it is generally conceded that the Louisiana territory extended westward to the Rocky Mountains, authorities are not in accord as to whether it extended west of the Rocky Mountains; but there were other grounds on which the United States claimed territory to the west thereof.

At the same time, the British Government had equally valid claims to territory west of the Rocky Mountains. These claims of the two Governments are set forth in the Historical Sketch (appendix I, p. 178) in this report and are relevant here insomuch as they overlapped and thus were subjects of diplomatic negotiations between the two Governments for many years—to be precise, until the treaty of 1846 was concluded.

After the conclusion of the Louisiana treaty, the United States Senate advised that the Hawkesbury-King convention relating to boundaries should be ratified without the fifth article. The British Government declined to accept such an amendment. Thus the question of the boundary westward from Lake of the Woods remained unsettled and was in suspense until 1807 when another endeavor was made to adjust it.

On the 31st of December 1806, the commercial articles of the Jay Treaty being about to expire, Messrs. Monroe and Pinkney, as Commissioners of the United States, with Lords Holland and Aukland as British Commissioners, signed a treaty of amity and commerce. After this treaty was concluded the British Commissioners proposed certain additional and explanatory articles, the fifth of which provided that the forty-ninth parallel of north latitude should form the boundary westward from Lake of the Woods "as far as the territories of the United States extend in that quarter", provided that nothing in the article should be construed "to extend to the northwest coast of America or to the territories belonging to or claimed by either party, on the continent of America to the westward of the Stony Mountains." The United States Commissioners objected to the words "as far as the territories of the United States extend in that quarter", and proposed to omit them. The British Commissioners in turn proposed to substitute the words, "as far as their said respective territories extend in that quarter", and to this proposal the United States Commissioners assented. The proviso in regard to territories west of the Stony Mountains was accepted in the form in which it was proposed. The Government of the United States, however, expressed a desire for the omission of the proviso on the ground that it was unnecessary and could have "little other effect than as an offensive intimation to Spain" that the claims of the United States extended "to the Pacific Ocean." However "reasonable" such claims might be "compared with those of others," it was, said Mr. Madison, Secretary of State, impolitic especially at that time, to strengthen Spanish jealousies of the United States. These articles relating to boundaries, however, were not concluded, as President Jefferson refused to submit the treaty itself to the United States Senate on account of objections to the articles relating to amity and commerce.

The question of this boundary next came up during the negotiations at Ghent leading up to the treaty of 1814. The United States plenipotentiaries proposed, in respect of this boundary, the article agreed on by the Commissioners of the United States and Great Britain in 1807. The British plenipotentiaries offered in turn the article first proposed by Lords Holland and Aukland, with an additional paragraph providing for free access by British subjects through the territory of the United States to the Mississippi, and for the free navigation of that river. The substance of an article so far as it related to the boundary line, was finally agreed upon; but the United States plenipotentiaries would not accede to the paragraph relating to the Mississippi, and the whole article was finally omitted from the treaty.

The treaty as finally ratified did not refer to the section of the boundary under discussion other than to provide for the establishment of the Northwesternmost

Point of Lake of the Woods in article VII which reads as follows:

TREATY OF PEACE AND AMITY (TREATY OF GHENT)

(Signed at Ghent December 24, 1814; ratifications exchanged February 17, 1815)

ARTICLE VII

It is further agreed that the said two last mentioned Commissioners after they shall have executed the duties assigned to them in the preceding Article, shall be, and they are hereby, authorized upon their oaths impartially to fix and determine according to the true intent of the said Treaty of Peace of one thousand seven hundred and eighty three, that part of the boundary between the dominions of the two Powers, which extends from the water communication between Lake Huron and Lake Superior to the most North Western point of the Lake of the Woods;—to decide to which of the two Parties the several Islands lying in the Lakes, water communications, and Rivers forming the said boundary do respectively belong in conformity with the true intent of the said Treaty of Peace of one thousand seven hundred and eighty three, and to cause such parts of the said boundary as require it to be surveyed and marked. The said Commissioners shall by a Report or declaration under their hands and seals, designate the boundary aforesaid, state their decision on the points thus referred to them, and particularize the Latitude and Longitude of the most North Western point of the Lake of the Woods, and of such other parts of the said boundary as they may deem proper. And both parties agree to consider such designation and decision as final and conclusive. And in the event of the said two Commissioners differing, or both or either of them refusing, declining, or wilfully omitting to act, such reports, declarations or statements shall be made by them or either of them, and such reference to a friendly Sovereign or State shall be made in all respects as in the latter part of the fourth Article is contained, and in as full a manner as if the same was herein repeated.

No further attempt to settle this boundary was made until the negotiations were under way which resulted in the conclusion of the convention between the United States and Great Britain of October 20, 1818. In these negotiations the United States plenipotentiaries proposed that the line should follow the 49th parallel of north latitude due west to the Pacific Ocean and they set forth their claims to this line by the Louisiana purchase as far as the Rocky Mountains and by the rights of discovery, exploration, and settlement west of the Rocky Mountains. An agreement was readily reached as to the portion of the line east of the Rocky Mountains, but the British plenipotentiaries set up counterclaims to the territory west of the Rocky Mountains. They did not make any formal proposal for a boundary, but intimated, however, that the Columbia River was the most convenient line that could be adopted, and that they would not agree to any arrangement that would not give

them a harbor at the mouth of the Columbia in common with the United States. At the fifth conference the British plenipotentiaries proposed an article to the effect that the country west of the Rocky Mountains lying between the 45th and 49th parallels of latitude should be open to the trade and commerce of both parties without prejudice to the claims of possession by either of them. The United States plenipotentiaries declined to accept the proposal as first made, but in the end an agreement along similar lines was reached which is embodied in article III of the convention.

The agreement adopting the boundary east of the Rocky Mountains is set forth in article II of the convention adopted October 20, 1818, and reads as follows:

Convention of 1818

(Signed October 20, 1818; ratifications exchanged January 30, 1819)

ARTICLE II

It is agreed that a Line drawn from the most North Western Point of the Lake of the Woods, along the forty Ninth Parallel of North Latitude, or, if the said Point shall not be in the Forty Ninth Parallel of North Latitude, then that a Line drawn from the said Point due North or South as the Case may be, until the said Line shall intersect the said Parallel of North Latitude, and from the Point of such Intersection due West along and with the said Parallel shall be the Line of Demarcation between the Territories of the United States, and those of His Britannic Majesty, and that the said Line shall form the Northern Boundary of the said Territories of the United States, and the Southern Boundary of the Territories of His Britannic Majesty, from the Lake of the Woods to the Stony Mountains.

ARTICLE III

It is agreed, that any Country that may be claimed by either Party on the North West Coast of America, Westward of the Stony Mountains, shall, together with it's Harbours, Bays, and Creeks, and the Navigation of all Rivers within the same, be free and open, for the term of ten Years from the date of the Signature of the present Convention, to the Vessels, Citizens, and Subjects of the Two Powers: it being well understood, that this Agreement is not to be construed to the Prejudice of any Claim, which either of the Two High Contracting Parties may have to any part of the said Country, nor shall it be taken to affect the Claims of any other Power or State to any part of the said Country; the only Object of The High Contracting Parties, in that respect, being to prevent disputes and differences amongst Themselves.

It will be noted from the wording of article II that the latitude of the most northwestern point of Lake of the Woods was not known by the framers of the treaty. And it will be further noted that the line extends "from the Lake of the Woods to the Stony Mountains." These points are of interest as will appear later when we find the line described in the treaty of 1842 as running south from the most northwestern point of Lake of the Woods to the 49th parallel and find "Rocky Mountains" substituted for "Stony Mountains," and finally, in the treaty of 1908, find a further change to "Summit of the Rocky Mountains," as the terminus of this section of the boundary.

By the treaty concluded February 22, 1819, between the United States and Spain, the United States acquired all of Spain's territorial rights in the Pacific northwest. This left Russia, Great Britain, and the United States as the contestants for territorial possession. Russia's claims to the Alaskan peninsula were well established

and were not contested; but the southern limit of her claims was not definite and was a subject of controversy. Emperor Paul of Russia having named 55° of north latitude as the southern limit of certain commercial privileges to his Russian-American Company in 1799, the United States, at least, supposed that latitude to be the southern limit of Russia's claims. This supposition was upset however by the ukase of 1821 by which the Emperior of Russia assumed to exclude all foreigners from carrying on commerce and from navigating and fishing within a hundred Italian miles of the coast from Bering Strait down to the 51st parallel of north latitude. This ukase was necessarily founded upon and carried with it an assertion of title to all territory north of the 51st parallel. Both Great Britain and the United States protested against it. Russia accepted these protests in a friendly spirit and it was agreed that an effort should be made to settle the territorial claims of the parties by negotiation. The negotiations between the United States and Great Britain failed of results and the final outcome was that the United States and Great Britain carried on separate negotiations with Russia. These separate negotiations resulted in the treaty of 1824 between the United States and Russia, in which the southern boundary of Russia's claims was designated as 54°40′ of north latitude, and the convention of 1825 between Great Britain and Russia, in which the boundary line between the possessions of Great Britain and of Russia were delimited with the same southern limit of 54°40'.

By these treaties Russia left it to the United States and Great Britain to settle between themselves their rival claims to territory south of 54°40' of north latitude. In 1826, following suggestions from the British Government, negotiations were resumed between the United States and Great Britain. During these negotiations the British plenipotentiaries adhered substantially to the line of the Columbia River, offering the United States, north of that line, a small detached territory "bounded on the west by the ocean, on the north by Fuca's Straits, on the east by the entrance of Admiralty Inlet and the peninsula between that and Hoods Inlet, and on the south by a line drawn thence to Gray's Harbor on the ocean." The United States, while not announcing the 49th parallel as the most southern line that would be accepted, adhered to that line as a basis of negotiation. Failing to reach a settlement the negotiators concluded a convention on August 6, 1827. indefinitely extending the joint occupation provided for in article III of the treaty of 1818, which article was now nearing its 10-year limit. The convention was duly ratified and ratifications were exchanged April 2, 1828. The pertinent articles of the convention, viz, I, II, and III, read as follows:

Convention Continuing in Force Article III of the Convention of October 20, 1818

(Signed August 6, 1827; ratifications exchanged April 2, 1828)

ARTICLE I

All the Provisions of the Third Article of the Convention concluded between the United States of America, and His Majesty The King of the United Kingdom of Great Britain and

Ireland, on the Twentieth of October 1818, shall be, and they are hereby, further indefinitely extended and continued in force, in the same manner as if all the Provisions of the said Article were herein specifically recited.

ARTICLE II

It shall be competent, however, to either of the Contracting Parties, in case either should think fit, at any time after the Twentieth of October 1828, on giving due notice of Twelve Months to the other Contracting Party, to annul and abrogate this Convention: and it shall, in such case, be accordingly entirely annulled and abrogated, after the expiration of the said term of notice

ARTICLE III

Nothing contained in this Convention, or in the Third Article of the Convention of the Twentieth of October 1818, hereby continued in force, shall be construed to impair, or in any manner affect, the Claims which either of the Contracting Parties may have to any part of the Country Westward of the Stoney or Rocky Mountains.

The continuance of the joint occupation proved to be inconvenient and irritating, and as time went on and the fertile valleys began to be settled, friction developed to a dangerous degree.

The Webster-Ashburton Treaty, concluded on August 9, 1842, failed to adjust the dispute, though it settled other boundary questions that had long been subjects of controversy. It did, however, redefine the boundary from the most northwestern point of Lake of the Woods to the Rocky Mountains. The latitude and longitude of the most northwestern point of Lake of the Woods had been determined by official surveys in 1825 ² and were made use of in the language of the treaty. The term "Rocky Mountains" was used in this treaty in the place of the "Stony Mountains" of the treaty of 1818. The portion of the second article of the Webster-Ashburton Treaty of 1842 which refers to this boundary reads as follows:

* * * from which the Commissioners traced the line to the most northwestern point of the Lake of the Woods;—thence, along the said line to the said most northwestern point, being in latitude 49°23′55″ north, and in longitude 95°14′38″ west from the Observatory at Greenwich; thence, according to existing treaties, due south to its intersection with the 49th parallel of north latitude, and along that parallel to the Rocky Mountains. * * *

Returning to the negotiations concerning the boundary west of the Rocky Mountains: Following the treaty of 1842, efforts were made by the British Minister at Washington to renew negotiations but without results.

On May 2, 1843, the American settlers in the "Oregon Territory" (the name by which this country had come to be known), set up a provisional government at a meeting held at Champoeg. The English Parliament had extended the colonial jurisdiction and civil laws of Canada to all British subjects on the Pacific coast. Thus there were two governments exercising jurisdiction in the same territory.

In 1844 negotiations were again renewed by Mr. Richard Pakenham who had then become Minister to Washington. These negotiations were interrupted by the death of Mr. Upshur, then Secretary of State. After the lapse of several months the negotiations were resumed by Mr. John C. Calhoun who succeeded Mr. Upshur as Secretary of State. The proposals submitted by Mr. Calhoun on the part of the United States and by Mr. Pakenham on the part of Great Britain were substantially the same as those discussed in London in 1827. Mr. Calhoun, however, offered the

² See location of most northwestern point of Lake of the Woods, p. 137.

49th parallel as an ultimatum. In January 1845, no agreement seemed possible, and Mr. Pakenham proposed submitting the dispute to arbitration. This proposal was declined by Mr. Calhoun. Meanwhile the controversy was becoming acute and the conditions in the territory becoming more intolerable. A movement had been made in Congress to erect a territorial government without defining the territorial limits over which its jurisdiction should extend. In May 1844 the Democratic Presidential Convention adopted a declaration popularly interpreted as meaning "fifty-four forty or fight," to the effect that the title of the United States "to the whole of the territory of Oregon" was "clear and unquestionable", and that "no part of the same ought to be ceded to England, or any other power."

President Polk, in his inaugural address in March 1845, repeated the declaration in "the very same words with marks of quotation." The declaration aroused

indignation in England, and war seemed imminent.

President Polk, in consideration of the acts of his predecessors and the seriousness of the situation, deemed it to be his duty to make another effort to settle matters. Accordingly Mr. Buchanan, Secretary of State under President Polk, on July 12, 1845, presented proposals of settlement to Mr. Pakenham who rejected them without referring them to his Government. Mr. Buchanan then withdrew the proposals which had been rejected. President Polk, in his annual message to Congress in December 1845, recommended that the notice required by the treaty of 1827 for the termination of the joint occupation be given.

Mr. Pakenham's rejection of Mr. Buchanan's proposals without reference was not approved by the British Government, and Mr. Pakenham urged a renewal of the proposals. The renewal was refused by the President. Mr. Pakenham then urged that the question be submitted to arbitration. This was definitely rejected by Mr. Buchanan on the 3d of January 1846 on the ground that it assumed that the title to a portion of the territory was valid, and thus took for granted "the very question in dispute." Mr. Pakenham then offered to refer to arbitration the question of title in either of the two powers to the whole of the territory; this in turn was declined by Mr. Buchanan.

On February 26, 1846, Mr. Buchanan took the matter up by letter with Mr. McLane, the American Minister, who was specially charged with the discussion of the question in London. Mr. McLane conferred personally with Lord Aberdeen with the result that new instructions were sent to Mr. Pakenham.

On April 27 the President approved a joint resolution of Congress by which he was authorized "at his discretion" to give the requisite notice to terminate the joint occupation under the treaty of 1827. Notice of abrogation of the treaty was conveyed to Lord Aberdeen by Mr. McLane on May 22, 1846.

On the 6th of June 1846 Mr. Pakenham presented to Mr. Buchanan a draft of a treaty. Before authorizing the Secretary of State to sign it, the President submitted this draft to the Senate. After three days' deliberation, the Senate by a vote of 37 to 12 advised the acceptance of the treaty as submitted. On June 15, 1846, the treaty was signed without the alteration of a single word. It was resubmitted to the Senate which gave its "advice and consent" by a vote of 41 to 14. The

ratification of the treaty brought to a close the long drawn-out dispute as to territorial rights of possession.

Other minor questions relative principally to property claims remained to be adjusted, and later, questions as to the definite location of the water boundary through Georgia, Haro, and Juan de Fuca Straits became the subject of further negotiations and conventions; but this report is not directly concerned with them.

The text of the treaty is as follows:

THE OREGON TREATY. TREATY ESTABLISHING THE BOUNDARY IN THE TERRITORY ON THE NORTHWEST COAST OF AMERICA LYING WESTWARD OF THE ROCKY MOUNTAINS

(Signed June 15, 1846; ratifications exchanged July 17, 1846)

The United States of America and Her Majesty the Queen of the United Kingdom of Great Britain and Ireland, deeming it to be desirable for the future welfare of both countries that the state of doubt and uncertainty which has hitherto prevailed respecting the sovereignty and government of the Territory on the northwest coast of America lying westward of the Rocky or Stony Mountains, should be finally terminated by an amicable compromise of the rights mutually asserted by the two Parties over the said Territory, have respectively named Plenipotentiaries to treat and agree concerning the terms of such settlement, that is to say: the President of the United States of America, has, on his part, furnished with Full Powers, James Buchanan, Secretary of State of the United States, and Her Majesty the Queen of the United Kingdom of Great Britain and Ireland, has, on her part, appointed the Right Honorable Richard Pakenham, a Member of Her Majesty's most honorable Privy Council, and Her Majesty's Envoy Extraordinary and Minister Plenipotentiary to the United States; who, after having communicated to each other their respective full Powers found in good and due form have agreed upon and concluded the following articles:

ARTICLE I

From the point on the forty-ninth parallel of north latitude where the boundary laid down in existing treaties and conventions between the United States and Great Britain terminates, the line of boundary between the territories of the United States and those of Her Britannic Majesty shall be continued westward along the said forty-ninth parallel of north latitude to the middle of the channel which separates the continent from Vancouver's Island; and thence southerly through the middle of the said channel, and of Fuca's Straits to the Pacific Ocean; provided, however, that the navigation of the whole of the said channel and Straits south of the forty ninth parallel of north latitude remain free and open to both Parties.

ARTICLE II

From the point at which the forty-ninth parallel of north latitude shall be found to intersect the great northern branch of the Columbia River, the navigation of the said branch shall be free and open to the Hudson's Bay Company and to all British subjects trading with the same, to the point where the said branch meets the main stream of the Columbia, and thence down the said main stream to the Ocean, with free access into and through the said River or Rivers, it being understood that all the usual portages along the line thus described shall in like manner be free and open. In navigating the said River or Rivers, British subjects with their goods and produce, shall be treated on the same footing as citizens of the United States; it being however always understood that nothing in this article shall be construed as preventing, or intended to prevent, the Government of the United States from making any regulations respecting the navigation of the said river or rivers, not inconsistent with the present treaty

ARTICLE III

In the future appropriation of the territory, south of the forty-ninth parallel of north latitude, as provided in the first article of this Treaty, the possessory rights of the Hudson's Bay Company and of all British subjects who may be already in the occupation of land or other property, lawfully acquired within the said Territory, shall be respected

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ARTICLE IV

The farms, lands, and other property of every description belonging to the Puget's Sound Agricultural Company on the north side of the Columbia River, shall be confirmed to the said Company. In case however the situation of those farms and lands should be considered by the United States to be of public and political importance, and the United States' Government should signify a desire to obtain possession of the whole, or of any part thereof, the property so required shall be transferred to the said Government, at a proper valuation, to be agreed upon between the Parties.

ARTICLE V

The present Treaty shall be ratified by the President of the United States, by and with the advice and consent of the Senate thereof, and by Her Britannic Majesty; and the ratifications shall be exchanged at London, at the expiration of six months from the date hereof, or sooner if possible

In witness whereof, the respective Plenipotentiaries have signed the same, and have affixed

thereto the seals of their arms.

Done at Washington the fifteenth day of June, in the year of our Lord one thousand eight hundred and forty-six.

[SEAL]

James Buchanan Richard Pakenham

After the treaty of 1846 no further treaties or conventions pertaining to the boundary from the eastern shore of Georgia Strait to the Northwesternmost Point of Lake of the Woods were negotiated until 1908. The investigations, correspondence, concurrent action, and negotiations leading up to the treaty of 1908 are briefly treated in this appendix. The text of the treaty is given in the body of this report, pages 1 to 10.

The boundary as defined in the treaty of 1846 was laid down and marked upon the ground by a joint Commission in 1858 to 1862, as described in appendix III. Across the Cascade and Rocky Mountains, however, the boundary was not marked continuously, and in some instances the marks were long distances apart. In the course of time these marks became obscure and difficult to find, and meanwhile the settlement and development of the adjacent territory created demands

for a more adequate marking than had originally been made.

As early as 1892 the Province of British Columbia called the attention of the Dominion Government to the necessity for a better definition of its southern boundary line to meet modern conditions, and in 1899 the attention of the Department of State of the United States was called to the fact that there were long intervals between monuments on the boundary west of the summit of the Rocky Mountains that had never been surveyed in any way. The discovery of minerals and the location of mineral claims in the border country led in 1900 to representations by the Province of British Columbia to the Dominion Government and by residents of the State of Washington to the United States Government, of the immediate necessity for a more thorough demarcation of the boundary on the ground. representations were followed by correspondence between the two Governments which brought about an examination of the boundary line west of the summit of the Rocky Mountains by Canadian and United States engineers in 1901-2. The reports of these engineers to their Governments showed the reliability of the work done by the original Commissioners, that the locations of the original marks were recoverable, and that all that remained to be done in order to render the marking thoroughly effective for the requirements of the present and the future was the replacement of the old monuments by more permanent ones and the interpolation of intermediate monuments at convenient points along the existent established boundary.

This required no new convention, and the two Governments promptly arrived at an understanding to the effect that they would concurrently undertake the work. Representatives, later recognized as commissioners, to carry on the work were nominated by the two Governments: Dr. O. H. Tittmann and Dr. C. D. Walcott by and for the United States, and Dr. W. F. King by and for His Britannic Majesty for Canada. The formal notices of the appointments of these representatives or commissioners are given in the text of this report, page 16. The final notes of the correspondence through which this understanding was reached are listed as follows:

Department of State of the United States; April 3, 1902 (No. 2410).

British Embassy, Lord Pauncefote; April 7, 1902 (No. 95).

British Embassy, Arthur S. Raikes; August 9, 1902 (No. 200).

Department of State of the United States; August 12, 1902 (No. 2513).

Extract from the Privy Council of the Dominion of Canada; October 14, 1902.

British Embassy, Michael H. Herbert; October 23, 1902 (No. 264).

These notes are to be found in the departmental files at Washington and Ottawa. The work of resurveying and remonumenting this section of the boundary was carried out through concurrent action by these Commissioners during the years 1903 to 1908. During this period the need for more effectively marking the entire boundary from the Atlantic to the Pacific Ocean, which had already been recognized, became increasingly apparent to the two Governments, and negotiations were carried on which resulted in the adoption of the treaty of April 11, 1908,³ providing for "the more complete definition and demarcation of the international boundary between the United States and the Dominion of Canada."

The joint surveys carried on under the provisions of the treaty of 1908 along this and other sections of the boundary revealed the need for the clarification of several questions regarding the boundary and the need for continuous maintenance to keep the markings effective. The discussion of these needs led up to the treaty of February 24, 1925, the text of which is given on page 11.

For a more detailed account of the negotiations leading up to the treaties discussed in the foregoing paragraphs the reader is referred to "History and Digest of the International Arbitrations to which the United States has been a Party", vol. I, by John Bassett Moore; and the notes of Chandler P. Anderson on the "Northern Boundary of the United States", which have been closely followed herein but abbreviated. Other references are noted in the publications just mentioned.

³ For text of treaty, see p. 1.

APPENDIX III

ORIGINAL SURVEYS AND DEMARCATION

BOUNDARY WEST OF THE SUMMIT OF THE ROCKY MOUNTAINS

After the adoption of the boundary west of the Rocky Mountains by the treaty of 1846, almost exactly ten years elapsed before any steps were taken to survey and mark the line upon the ground. In the meantime, the Territory of Oregon was organized by an act of Congress on August 4, 1848, and the Territory of Washington was organized from the northern portion of the Oregon Territory by an act of Congress on March 2, 1853. In 1849 Vancouver Island was constituted a British Colony. In 1855 gold was discovered on the Columbia River at the mouth of the Pend-d'Oreille (Clark Fork) near the 49th parallel. The country on both sides of the border was rapidly being settled and it became increasingly urgent that the boundary line should be located on the ground and marked.

In 1856 Congress passed an act, approved August 11, to provide for the demarcation of the boundary between Washington Territory and the possessions of Great Britain in accordance with the provisions of article I of the treaty of 1846. At that time the Territory of Washington extended along the 49th parallel eastward to the summit of the Rocky Mountains. The act of Congress carried an appropriation for the work and provided for a Commissioner, a chief astronomer, and a surveyor on the part of the United States to unite and act with similar officers to be appointed by Her Britannic Majesty, to survey and monument the boundary.

The Commission was promptly organized on the part of the United States and on February 14, 1857, Archibald Campbell was appointed Commissioner, which position he held until the completion of the work in 1869.

Great Britain assented to the proposal for a joint commission and appointed Capt. James Charles Prevost, R. N., as first Commissioner, and Capt. George Henry Richards, R. N., as second Commissioner with powers to act as Commissioner only in the event of the death of Captain Prevost.

Commissioners Campbell and Prevost held their first meeting on June 27, 1857, on board H. M. S. Satellite, Captain Prevost's ship, in Esquimalt Harbor. The respective commissions of all the officials were exhibited, read, and found in due form. Captain Prevost's commission, however, did not extend to the whole line, his instructions reading, "so much of the boundary between Her Majesty's possessions in North America and the territories of the United States as is comprised between the continent of America and Vancouver's Island."

A second meeting of the Commissioners was held three weeks later, but as the second British Commissioner, Captain Richards, who was to act as chief astronomer, had not yet arrived, it was decided that nothing could be done at the time in regard to the water boundary.

Accordingly, the United States Commissioner turned his attention to the land boundary. He began operations with his party on the 49th parallel at Point Roberts on the eastern shore of Georgia Strait, and carried on work independently during the remainder of the year 1857 and the spring of 1858. His further relations with Captain Prevost concerning the water boundary terminated in disagreement and consequently in failure to establish that boundary. (See report—International Boundary Commission—Forty-ninth Parallel to the Pacific Ocean; 1921.)

On February 3, 1858, Capt. John Summerfield Hawkins, Royal Engineers, was appointed Commissioner by Queen Victoria "for the purpose of ascertaining and marking out, in conjunction with a Commissioner on the part of the United States of America, the line of Boundary under the Treaty between Gr. Britain and the United States of the 15th of June, 1846, from the point where the Boundary laid down in previously existing Treaties and Conventions terminates to the point at which the 49th parallel of North Latitude strikes the eastern shore of the Channel which separates the continent from Vancouver's Island." Captain Hawkins reached Esquimalt, Vancouver Island, about the middle of June 1858. Soon thereafter he began work in conjunction with the United States parties already in the field.

The survey and demarcation executed by Commissioners Campbell and Hawkins extended from the western shore of Point Roberts on Georgia Strait to the summit (crest of the watershed) of the Rocky Mountains. The commission of Mr. Campbell was limited to the boundary between Washington Territory and the possessions of Great Britain. The summit of the Rocky Mountains was the eastern limit of Washington Territory. The commission of Captain Hawkins, as just noted was "from the point where the Boundary laid down in previously existing Treaties and Conventions terminates to the point"—etc. The instructions issued to Captain Hawkins by his Government refer to this point in the following language: "* and all that you will have to do will be to continue to mark out the line along that parallel till it reaches the point 'where the boundary laid down in existing Treaties and Conventions between Great Britain and the United States terminates.' That point is as you will see by the second article of the Treaty of October 20, 1818, herewith transmitted to you, the 'Stony' or 'Rocky' Mountains; and it would seem from the wording of that article that the point is to be found on the eastern base of those mountains.'

It will be readily seen that joint operations could not be carried farther east than the summit of the Rocky Mountains. Near the conclusion of the work Commissioner Hawkins in writing to his Secretary of State for Foreign Affairs, under date of December 31, 1861, says in regard to this terminus of the work:

In concluding this subject, I have to observe that when terminating the labours of the Commission on the Crest or Watershed of the Rocky Mountains, I did not overlook that my original instructions in despatch No. 2 of the 30th March 1858 informed that from the wording of the second article of the treaty of October 20th, 1818, it would seem that the point "where the Boundary laid down in existing treaties and conventions between Great Britian and the United States terminates" is to be found on the eastern base of the mountains. I learned however from the instructions of the U. S. Commissioner that the Act of Congress of the 11th August 1856 under which he was appointed limited the proceedings of the U. S. Commission to the demarcation of the line of Boundary "which forms the Boundary line between Washington Territory and the British Possessions" and Mr Campbell gave me to understand that the northern boundary of

Washington Territory ended on the crest of the Rocky Mountains. I considered, therefore, that any work performed by the British Commission beyond that point would have no joint official character; and apart from the serious loss of time which must have been incurred in executing it, a joint agreement as to the point at the base of the Mountains at which the Boundary under the Convention of 20th October, 1818, might be assumed to terminate would have been necessary, into Which the U. S. Commissioner was not prepared to enter.

Since the termination of the survey by Commissioners Campbell and Hawkins at the summit of the Rocky Mountains, the summit has been quite uniformly used to designate the dividing point between the sections of the boundary lying east and

lying west of the Rocky Mountains.

The available records of the joint survey made under Commissioners Campbell and Hawkins are not as complete as might be desired. We find that after the field work was completed, Commissioner Campbell had a manuscript report of the work prepared and submitted it to the Department of State in Washington. This report was not published, and the manuscript has been lost from view for many years. When the Northern Boundary Commission was created, in 1872, Archibald Campbell was appointed United States Commissioner for that boundary survey. At the outset of that work he found it desirable to consult the records of the "Northwestern Boundary Survey" upon which he had previously been engaged. Accordingly he wrote the following letter, which is now on file in the Department of State in Washington:

U. S. NORTHERN BOUNDARY COMMISSION
Washington, D. C., June 27, 1872.

SIR:

In preparing for the duties of the boundary commission it would be of the greatest assistance to have the use of the records, notebooks, and other papers of the Northwest Boundary Commission, deposited by me in the Department at the close of the work in October, 1869.

I have therefore the honor to request that you allow me to withdraw these records and papers

temporarily. Before leaving for the field they will be returned to the Department.

I have the honor to be, very respectfully, your obedient servant,

Archibald Campbell, Commissioner, Northern Boundary Survey.

Hon. Chas. Hale, Acting Secretary of State.

This letter is endorsed: "Papers, etc., herein referred to sent to Mr. Campbell 27th June." The most diligent search and inquiry has failed to find further trace of the report.

There are, however, manuscript records, memoranda, notes, correspondence, maps, etc., of the survey in the possession of the Department of State at Washington from which much information regarding the progress and the methods of the survey can be drawn.

These records and maps are described in considerable detail in the history of the establishment, survey, and marking of this portion of the boundary, with a summary of results, prepared by Marcus Baker of the United States Geological Survey in the year 1900, from an examination of the available records "memoranda, notes, sketches, pictures, correspondence, and the memories of men still living", and published as Bulletin No. 174 of the United States Geological Survey, under the title of "Survey of the Northwestern Boundary of the United States, 1857–1861."

By a strange coincidence, the British records of the survey were also lost from view for many years. When questions began to arise as to the markings of the

boundary upon the ground, about 1890 and later, diligent search was made in London for the records, but without avail. In 1898, Dr. Otto Klotz, Astronomer for the Dominion Government, discovered the missing records, quite by accident, at the Royal Observatory at Greenwich. He states:

Such was the situation [referring to the loss of the records] when the writer was sent by the Dominion Government to London and Petrograd on a special mission, in which was included the obtaining of information regarding the records and final report of the survey. All of the Government offices in London were visited in which there was the faintest likelihood that the records might be stored, but all to no avail, and no one seemed to be able to give any assistance. Before leaving England, however, the writer, as Astronomer for the Dominion Government, naturally paid a visit to the Royal Observatory at Greenwich. By chance his eye caught the initials B. N. A. on some boxes on the top of the library shelves—letters at once interpreted as possibly standing for British North America. The boxes were taken down, the dust of years removed, and in them lay the long-lost records of the international survey of the forty-ninth parallel. ¹

The British records descriptive of the survey are now to be found in the British "Foreign Office Correspondence" and, in addition to the jointly signed final report, consist principally of the letters and periodic reports of Captain Hawkins to his Government.

The boundary as laid down from the surveys of the Joint Commission is shown on seven maps and an index map. These maps are dated May 7, 1869, and are signed by the Commissioners and surveyors of the respective Governments. One duplicate original set of maps is on file in the Department of State in Washington. The original signed set is deposited with the British Government.

This set of maps was adopted on behalf of the two Governments by Sir Edward Thornton, the British Minister at Washington, and Hamilton Fish, Secretary of State, on February 24, 1870, by joining in the following written declaration:

ADOPTION OF OFFICIAL MAPS

DECLARATION APPROVING AND ADOPTING THE MAPS PREPARED BY THE JOINT COMMISSION OF THE NORTHWEST BOUNDARY FOR SURVEYING AND MARKING THE BOUNDARIES BETWEEN THE BRITISH POSSESSIONS AND THE UNITED STATES ALONG THE 49TH PARALLEL OF NORTH LATITUDE, UNDER THE FIRST ARTICLE OF THE TREATY OF 15TH JUNE, 1846

Signed at Washington February 24th, 1870

The undersigned Hamilton Fish, Secretary of State of the United States, and Edward Thornton, Esquire, Her Britannic Majesty's Envoy Extraordinary and Minister Plenipotentiary to the United States, duly authorized by their respective Governments, having met together:

The set of maps, seven in number, which have been prepared by the Commissioners appointed by the two Powers to survey and mark out the Boundary between their respective Territories under the first article of the Treaty concluded between them at Washington on the 15th of June, 1846, having been produced;

And it appearing that they do correctly indicate the said Boundary from the point where the Boundary laid down in Treaties and Conventions prior to June 15th, 1846, terminates Westward on the 49th Parallel of North Latitude to the Eastern shore of the Gulf of Georgia, which Boundary has been defined by the Commissioners by marks upon the ground;

The Undersigned, without prejudice to the rights of their respective Governments as to the settlement and the determination of the remainder of the said Boundary, hereby declare that the said maps certified and authenticated under the signatures of Archibald Campbell, Esquire, the Commissioner of the United States, and of Colonel John Summerfield Hawkins, Her Britannic Majesty's Commissioner, and of which duplicate copies similarly certified and authenticated

¹ The History of the Forty-ninth Parallel Survey West of the Rocky Mountains, by Otto Klotz. The Geographic Review, vol. III, no. 5 (May 1917).

are in the possession of the Government of Her Britannic Majesty have been duly examined and considered, and, as well as the marks by which the Boundary to the Eastern shore of the Gulf of Georgia has been defined upon the ground, are approved, agreed to, and adopted by both Governments.

In witness whereof the respective Plenipotentiaries have signed the same and have affixed

thereto their respective seals.

Done at Washington the twenty-fourth day of February, in the year of our Lord, one thousand eight hundred and seventy.

[SEAL]

Hamilton Fish Edwd. Thornton

From the records thus briefly described, the procedure and results of the survey have been abstracted with sufficient detail to permit of a faithful retracement of the entire boundary as ascertained, laid down, and marked by the original Commission.

An outline of the procedure and results of the survey to acquaint the reader with the basic facts upon which the resurvey and demarcation described in this report is dependent seems here in order.

CONFERENCES AND AGREEMENTS OF THE COMMISSIONERS OF 1857-1869

The first meeting of the Joint Commission for determining and marking the land boundary west of the Rocky Mountains was held at the United States Boundary Commission camp at Semiahmoo, August 13, 1858. At this meeting the credentials of the Commissioners were examined and found satisfactory, and certain agreements were entered into regarding the methods of carrying on the proposed work. These agreements as quoted from the British Foreign Office records are as follows:

The Commissioners agreed that that part of the Boundary should be first determined which lies between the point where the 49th parallel of North Latitude strikes the shore of Semiahmoo Bay, and the Cascade Mountains, and that such determination of the Boundary be commenced at the point fixed by Captn. G. H. Richards, R. N. the British second Commissioner for the determination of the Water Boundary—under the Treaty of June 15th 1846 and Lieutenant J. G. Parke, United States Topographical Engineers and Chief Astronomer, on the shore of

Semiahmoo Bay.

After discussing plans for determining and marking the line, as far eastward as the Cascade Mountains, it was concluded to be inexpedient at the present time in consequence of the great expense, consumption of time, and the impracticable nature of the Country, to mark the whole Boundary by cutting a track through the dense forest. It was therefore agreed to ascertain points on the line by the determination of astronomical points at convenient intervals on or near the Boundary; and to mark such Astronomical Stations or points fixed on the Parallel forming the Boundary, by cutting a track of not less than 20 feet in width on each side for the distance of half a mile or more according to circumstances. Further that the Boundary be determined and similarly marked where it crosses streams of any size, permanent trails, or any striking natural features of the Country. In the vicinity of settlements on or near the line, it is deemed advisable to cut the track for a greater distance, and to mark it in a manner to be determined hereafter.

These agreements are signed by both Commissioners.

The second meeting of the Joint Commission was held at Semiahmoo, April 16 to 23, 1859. The minutes of this meeting record that plans for joint operations were fully discussed and that various proposals were submitted by each Commissioner, but there was a failure of agreement in all but two of the items. The United States Commissioner refused to sign the minutes. The drafted minutes so far as they relate to discussions and agreements read as follows:

1. Plans for the prosecution of the joint operations of the Commission during the present season were fully discussed.

2. The British Commission proposed that the arrangement, recorded in the Protocol, signed on the 14th August, 1858, that it being "inexpedient at the present time in consequence of the great expense, consumption of time, and the impracticable nature of the Country to mark the whole Boundary by cutting a track through the dense forest. It was therefore agreed to ascertain points on the line by the determination of astronomical points at convenient intervals, on or near the Boundary—and to mark such Astronomical stations, or points fixed on the parallel forming the Boundary, by cutting a track of not less than twenty feet in width on each side for the distance of half a mile or more according to circumstances," be revised. He proposed that in accessible forest land cuttings of the width of 20 feet or thereabouts be made throughout, and the Parallel laid out and marked at intervals of about one mile by suitable Monuments; the Boundary line being admitted to lie evenly between such marked points, as in such limited distance the curve of the Parallel would be practicably inappreciable: and that in rugged or mountainous districts through which portions of the Boundary may run, and which are physically inaccessible, or impenetrable, or which are practically so to the extent of making their beneficial occupation improbable and the labour and expense of minutely marking the Boundary therein consequently unnecessary; as many prominent or accessible points as may be possible or necessary, be determined by survey between the adjacent Astronomical stations and marked by beacons, cairns, or

lasting monuments of some suitable description.
3. The United States Commissioner seeing no good reason to change the conclusion arrived at by the joint Commission on the 13th August, 1858 that it is "inexpedient at the present time in consequence of the great expense, consumption of time, and the impracticable nature of the Country to mark the whole Boundary, by cutting a track through the dense forest" and considering the remainder of the proposition of the British Commissioner as already met by the agreement of the joint Commission to determine and mark out the Boundary "where it crosses streams of any size, permanent trails, or any striking natural features of the country," declined to adopt

the proposition.

4. The British Commissioner announced his intention to proceed with the demarcation of the Boundary, between Semiahmoo Bay and the Cascade Mountains, in the manner above proposed by him, to such an extent as circumstances would permit; as delay in doing so might involve the loss of the present season for such purpose, and the inconvenient postponement of the work in view of the probable removal of the two Commissions from this part of the Country; and as this portion of the operations would thus be undertaken solely by the British Commission, that he should report his proceedings to the British Government for their further instructions in such cases

5. The British Commissioner subsequently requested the United States Commissioner to continue the cutting of the Boundary from Semiahmoo Bay, which had been commenced by his parties, to some further distance inland in extension of the arrangement recorded in the Protocol of the 14th August 1858 "To cut the track for a greater distance in the vicinity of settlements on or near the line," so as to meet the proposed cutting of the British Commission proceeding westward from Sumass; which point the United States Commissioner reserved for further

consideration.

6. A proposition made by the British Commissioner respecting the nature and provision of suitable monuments for marking and preserving the Boundary in all accessible portions of it, was not fully discussed, and no decision upon it was arrived at, in consequence of the United States Commissioner having declined to proceed with the demarcation of the Boundary line throughout. To a further suggestion by the British Commissioner, that he should be authorized to procure at the expense of the joint Commission a sufficient number of iron monuments to define the portion of Boundary he had announced his intention of marking out this season, the United States Commissioner declined to accede.

7. The Commissions agreed that the determination of such astronomical points on or near the Boundary as are still required to complete the series between Semiahmoo and the western slopes of the Cascade Mountains at Chilukweyuk be undertaken by the British Commission; and that the determination of astronomical points at convenient intervals in continuation of the series eastward from Chilukweyuk towards the Columbia River be continued by both Commissions. It was also agreed that the principle on which points be taken up by the astronomical parties of the two Commissions be that of occupying them alternately, subject to such modifications by

the executive officers as may be mutually agreed upon by them

8. The elements assumed for the figure of the Earth (Bessel's) and the nature of the computations for the length of the ordinates for connecting tangents with the parallel were

agreed upon.

9. The British Commissioner proposed the consideration of the astronomical results at such points as have already been observed by the two Commissions, with a view to their being finally adopted if found to be satisfactory.

10. The United States Commissioner proposed, before the adoption of those points, that the joint Commission adopt the three following points on the 49th Parallel, viz: 1st. The point where the Parallel intersects the Continent on the Western face of Point Roberts; 2nd. The point where the Parallel intersects the eastern face of Point Roberts; 3rd. The point where the

Parallel intersects the eastern shore of Semiahmoo Bay.

11. The British Commissioner declined entering upon the present consideration of the portion of the Boundary, between the eastern shore of Semiahmoo Bay and the western face of Point Roberts, in view of the circumstances which occurred between the British Water Boundary and the United States Commissioners prior to this question having been brought under his notice. He further stated that the points in question are most satisfactorily determined by astronomical operations, and that the postponement of their final adoption ought to have no effect on the course of proceedings eastward of Semiahmoo.

12. While circumstances exist which prevent the British Commissioner adopting these points, the United States Commissioner declined to adopt the points submitted for consideration

by the British Commissioner.

Consequent upon failure to reach full accord at this conference, each Commissioner carried on work more or less independently during the interval between this and the next conference.

The third conference was held at Harney Depot, Washington Territory, on November 6 to 8, 1860. The items of discussion and agreement recorded in the minutes of this meeting are as follows:

1. The operations of the British and United States Commissions from the western terminus of the Land Boundary at Point Roberts to the eastern terminus at the summit of the Rocky Mountains were mutually explained; and the future course of operations in the field was

2. The Commissioners agreed that the portion of the Boundary extending from the western terminus at Point Roberts to the western slope of the Cascade Mountains be marked by iron monuments at suitable intervals. That the portion extending from the crossing of the Boundary at the Similkameen river eastward towards the Columbia river be marked by stone beacons, exclusive of the intervals which from their rugged and mountainous nature may render such minute marking of the Boundary unnecessary. That the portion of accessible ground in the valley at the eastern crossing of the Kootenay River be also marked by stone beacons—and that

the space between the Kishenehu and Flathead Rivers be marked in a similar manner.

The Commissioners agreed that the points on the Boundary ascertained by the two Commissions by the determination of astronomical points at convenient intervals be acknowledged; subject to the future mutual examination of the astronomical observations and of their results, on the final completion of the field operations.

We find no record of other formal joint conferences of the Commissioners held during their field operations. There are, however, records of informal conferences between the officers of the two sections of the Commission regarding details of the work, and in the end, the separate and independent operations of the two sections were mutually accepted by the Commissioners.

The field work of the United States parties seems to have been completed some time during the season of 1861, that of the British section sometime early in 1862; the exact dates do not appear. After the close of field work the British Commissioner returned to London and maintained offices there until the completion of the necessary office work. Likewise the United States Commissioner maintained an office in Washington.

During the time the office work was being completed there appear to have been no joint meetings of the Commission. The chief astronomer to the British Commissioner, Capt. R. W. Haig, however, spent some time with the United States Commission in Washington in the latter part of 1862, and about four months again in 1863, conferring in regard to the drawing of the final joint maps of the survey.

The fourth and final joint conference of the Commissioners was held in Washington, May 4 to 7, 1869. At this meeting the work of the Joint Commission was brought to a close.

The text of the minutes of this meeting as submitted by Colonel Hawkins to his Government are here given in full:

Washington, D. C., 1869.

Meetings of the Commission on the part of Great Britain to ascertain and mark out so much of the line of Boundary between the British Possessions and the United States described in the First Article of the Treaty between Her Britannic Majesty and the United States of America dated 15th June 1846 as lies between the Rocky or Stony Mountains and the Eastern shore of the Channel which separates the Continent of North America from Vancouver's Island, and the Commission on the part of the United States to carry into effect the first Article of the Treaty aforesaid, held at the office of the United States Boundary Commission, Washington, District of Columbia, U. S. on the 4th, 5th, 6th, and 7th May 1869.

John Summerfield Hawkins, Colonel Rl. Engrs. Her Majesty's Commissioner for ascertaining and marking out the line of Boundary from the point on the Forty-ninth Parallel of North Latitude where the Boundary laid down in existing Treaties and Conventions between Great Britain and the United States terminates, to the point at which the Forty-ninth Parallel of North Latitude strikes the eastern shore of the Channel which separates the Continent from

Vancouver's Island.
Samuel Anderson, Lieut: Royal Engineers, Secretary to the British Commission.

Archibald Campbell, Commissioner on the part of the United States to carry into effect the first Article of the Treaty of the 15th June 1846 between the United States and Great Britain.

John G. Parke, Major U. S. Engineers and Brevet Major General U. S. A.—Chief Astronomer and Surveyor on the part of the United States to carry into effect the first Article of the Treaty as aforesaid.

William J. Warren—Secretary to the United States Commission.

Robert Wolseley Haig, Captain Royal Artillery, Chief Astronomer to the British Commission—was unable to attend the meetings of the joint Commission on account of serious illness.

1. The astronomical and geodetical determinations of the several astronomical stations, and of the points on the Forty-ninth Parallel of North Latitude by which the Boundary has been defined between its western terminus at Point Roberts in West Longitude 123°3′53" and its eastern terminus on the watershed of the Rocky Mountains in west longitude 114°3′28′ agreed upon and exchanged in May 1863 between Captain R. W. Haig, R. A. Chief Astronomer of the British Commission and G. Clinton Gardner, Assistant Astronomer and Surveyor to the United States Commission having been carefully compared and corrected are finally adopted; and lists of them are countersigned (2) and hereunto attached.

2. The two sets of seven Maps prepared severally by the respective Commissions upon the above named data on a scale of 1:120,000 having been carefully compared and countersigned, are hereby declared to represent so much of the Boundary described in the First Article of the Treaty between Her Britannic Majesty and the United States of America dated 15th June 1846 as is comprised between the intersection of the watershed of the Rocky Mountains by the Forty-ninth Parallel of North Latitude in west longitude 114°3′28″ and the point at which the 49th parallel of north latitude strikes the Eastern shore of the Channel which separates the Continent from Vancouver's Island in West Longitude 123°3′53″.

3. It is agreed by the Commissioners that, between any two successive defined points, marked on the ground shown on the maps, and set forth in the accompanying lists, the line of Boundary above described is to be understood to be a right or straight line; and that this rule is to apply throughout the entire Boundary without regard to the distances between the consecutive points or to the course of the parallel in such intervals.

J. S. HAWKINS, Colonel Rl. Engrs., H. B. M. Commissioner, 7th May, 1869.

ARCHIBALD CAMPBELL, U. S. Commissioner, de. de. de. May 7th, 1869.

FINAL REPORT OF THE BRITISH COMMISSIONER

Immediately following the Washington conference of the Commissioners, of May 7, 1869, Colonel Hawkins made a brief final report to his Government in which he recapitulated the work of the Commission. He accompanied the report with copies of the minutes of the conferences of the Commissioners (which have already been quoted herein) and the two tables of geodetic coordinates which had been agreed to and signed by himself and Commissioner Campbell. The full text² of the report followed by the two signed tables is here given:

> H. M. BOUNDARY COMMISSION. Washington, U. S. 10th May, 1869.

My Lord,—In compliance with your instructions conveyed to me by Mr. Hammond on the 22nd February, I left Barbados on the 9th and arrived at New York on the 21st April. Lieut: S. Anderson, R. E., Secretary to the Boundary Commission, arrived on the same night and joined me on the following morning. We proceeded to Washington on the 23rd April; and having reported our arrival to Her Majesty's Minister on the morning of the 24th, I put myself into immediate communication with Mr. A. Campbell, the United States Commissioner.

2. I have now the honor to inform your Lordship that on the afternoon of the 7th instant our labours were brought to a conclusion, which will I hope be quite satisfactory to you and Her Majesty's Government, and meet with the Approval of Her Majesty. Several days were occupied in the careful comparison of the astronomical determinations, and of the Maps, &c., and formal meetings of the joint Commission were held on 4th, 5th, 6th and 7th May. A protocol authenticating the points by which the land Boundary has been defined upon the ground, and the maps severally prepared by the two Commissions was agreed upon; and it and the maps were countersigned by Mr. Campbell and myself on the 7th instant. The protocol is herewith enclosed, with the two lists of astronomical determinations alluded to in its first clause; together with the originals of the two protocols adopted on the 14th August, 1858, and 8th November, 1860, Copies of which were sent to the Foreign Office with my letters, Nos. 3 and 14 dated 28th March, 1859, and 28th March, 1861, and of the minutes of the proceedings of the joint Commission in April 1859 on which occasion no agreement was arrived at as reported in my letter No: 6 of the 31st May 1859. The maps require some trifling corrections of detail and the addition of some names common to the two sets; and upon their completion I have desired Lieut: Anderson to convey them to the Foreign Office, to be disposed of as your Lordship may see fit to direct.

3. The detailed reports made by me during the progress of the work contain minute information both as to our operations and the nature of the country traversed by the Land Boundary; but upon reporting the execution of so much of the Treaty of the 15th June, 1846, as was comprised in my Commission it may be as well to recapitulate in brief terms the nature and

results of those operations.

4. Between the extreme east and west points, upon the watershed of the Rocky Mountains and the eastern shore of the Channel which separates the Continent of North America from Vancouver's Island in West Longitude 114°3′34′′ and 123°3′53′′, the exact length of the Boundary upon the 49th Parallel of North Latitude is 409½ miles. The position of the Parallel was determined from 28 astronomical stations, 11 of which were established by the British Commission, 14 by the American Commission and 3 were observed from by both. Another station was fixed by the British Commission, at Schweltza Lake, but it was rejected for the reasons given in paragraphs 11 and 16 of my Report No: 9 of the 21st May 1860 and again referred to in letter No: 24 dated 31st December 1861 though our after experience of the most accurate instrumental observations in that mountainous country now leads to the conclusion that the result at Schweltza was quite as trustworthy as any of the others. It is however not included in our final determina-tions. I believe the observations of the two Commissions to have been made with the utmost attainable precision, which is most conclusively shown by the computations; but upon connecting 5 of the stations by the demarcation of a continuous line of Boundary in the 60 miles between Similkameen and Statapoosten stations, we were greatly disappointed by the discovery of

² The quotations from Foreign Office Correspondence, including the report of Colonel Hawkins and the signed tables here referred to, follow the text of the Canadian Department of the Interior's publication entitled "Certain Correspondence of the Foreign Office and of the Hudson's Bay Company, Copied from Original Documents, London, 1898", Government Printing Bureau, Ottawa, 1899.

somewhat large discrepancies between all the determinations of the accuracy of which we had previously been quite satisfied, and which can only be attributed to prevading [sic] physical causes affecting the Instrumental observations which were quite beyond our control. By agreement these discrepancies were adjusted by the U. S. Commission, by the verification of the work of the British Commission and the adoption of a mean parallel between the determinations alluded to which probably approximates very nearly to the true 49th parallel; but as this test was not practicable in any other cases, the astronomical determinations have in them been necessarily adhered to.

5. The actual demarcation was affected [sic] as follows:—The western extremity of the Boundary is marked by a substantial Granite obelisk in West Longitude 123°3′53", which stands upon a steep cliff on the western face of the prolmontory [sic] of Point Roberts, about 160 feet above the The several faces of the obelisk are inscribed as follows—on the north face with the names of Her Majesty's water and Land Boundary Commissioners, Captn. J. C. Prevost and G. H. Richards, R. N., and Lieut: Colonel J. S. Hawkins, R. E., on the South face with the name of the American Commissioner Archibald Campbell,—on the West face with the designation and date of the Treaty, viz: Treaty of Washington, 15th June, 1846,—and on the east face with the Latitude and Longitude, and the year of erection, viz: Latitude 49°0′0″ N., Longitude 123°3′53″ W, Erected 1861. For 44% miles eastward there are 42 iron pillars placed at points on the Boundary which the officer to whom the duty was entrusted thought most suitable and convenient. One pillar stands on the eastern face of Point Roberts, 2 miles 704 yards from the obelisk, and there are two intermediate pillars in the interval at average distances apart of somewhat more than ¾ mile. A pillar on the west shore of Semiahmoo Bay is 12 m:1177 yards: from that on Point Roberts on the opposite side of the Bay; and thence in 29% miles to the easternmost pillar the average distance apart is about 1380 yds. varying between one mile 1245 yds., and 198 yds., on the opposite banks of the Sumass River. These pillars all stand in a continuous cutting through the forest or in intervening patches of swamp and Prairie. From the easternmost iron pillar to the right or west bank of the Similkameen River, in 107% miles, the Boundary is defined in the vicinity of 9 astronomical stations by 19 cairns or pyramids built of dry stones as carefully as the materials and circumstances would permit, and one bench-mark cut on the face of a rock (at Ensakwatch); and at several stations short vistas were also cut in the forest, between the cairns. This wide interval comprises the rugged and inhospitable region of the Cascade Mountains in which it would only have been possible to mark the Boundary line more continuously by an expenditure of time and money out of all proportion to the object in view. One of the widest unmarked intervals on the Boundary occurs in these Mountains, between Pasayten and Naisnuloh, the distance between the marked points being 23% miles; and this might have been obviated by placing a station on the main or western branch of the Naisnuloh River which however would have prolonged the work of the British Commission by another Season.—
From a cairn at the foot of the Mountains on the West side of the Similkameen River to the

From a cairn at the foot of the Mountains on the West side of the Similkameen River to the east or left bank of the Columbia, the Boundary for 95 miles is well and continuously marked by 69 stone cairns and one mound of earth, and by forest cuttings in all necessary cases. This was the most favourable portion of the work part of the line passing over rolling prairie country interspersed with wood; but very considerable portions were also mountainous, rugged and heavily timbered, though more accessible from the valley of the Newhoialpitkwn River than were the Cascade Mountains. Two cairns stand within 129 yards of each other on the east bank of the Columbia River (one having been placed by each Commission) and the average distance apart of the remainder is 1 mile 679 yards. From the hill tops the line of Boundary

For the remaining 161% miles between the eastern cairn on the left bank of the Columbia River and the terminal point on the watershed of the Rocky Mountains in West Longitude 114°3′28", the Boundary passes over successive Mountain ranges intersected only by the Valley of the Kootenay River at two points 75¾ miles apart, and by the adjacent valleys of the Flathead River and its tributary Kishenehu Creek, by which alone, the 49th parallel is practically accessible though even then by long circuitous routes. This portion of the line is marked in the vicinity of 9 astronomical stations, by 26 cairns and one bench-mark cut in the face of a rock at the Kootenay Mtn. Station, and by a cairn fixed by survey on the trail between Kootenay West and Mooyie Stations; and the usual forest vistas were cut at the several defined points, besides longer cuttings of 10 and 7 miles at the eastern crossing of the Kootenay, and between the Flathead and Kishenehu Rivers. No better means for marking the eastern end of the Boundary were at command than by a dry stone pyramid of the usual description which was built as carefully as possible, and which may be preserved for many years by its protected situation on a narrow saddle with precipitous sides connecting two lofty mountains, which position will moreover serve to identify the approximate locality of the Boundary at any future time.

Between the Columbia and the Rocky Mountains, exclusive of the Mooyie trail cairn, and the intervals between Kootenay Mountain and Kootenay West stations and Mooyie and Yahk stations, the distances between the consecutively marked points at the several astronomical stations average about 13½ miles; but between the stations named they extend to 25 and 24 miles owing to the inaccessible nature of the intervening country which is quite as bad as the

Cascade Mountains.

6. Having thus described the manner in which the Land Boundary has been marked from end to end, I respectfully request your Lordship's consideration of the 3rd Article of the closing protocol by which the Commissioners agreed to understand the Boundary laid out by them to consist of a series of straight lines between the successively marked points, without regard to the distances between those points or the curve of the parallel in the longer intervals. We were induced to do this upon the consideration that it was of the greatest importance, nothing should be left for future discussion or settlement, and that our operations should be final and conclusive. Even had the Boundary line been continuously marked throughout by defined points at say a mile apart, the actual parallel would have been departed from by the straight lines or chords joining such lines upon it; and owing to the insuperable difficulties attending a more minute demarcation in the rugged country traversed by us, we have been compelled to adopt a more irregular and longer sided polygon than we should have wished. I may state that opposite the centre of a chord of 25 miles in length the departure from the 49th parallel would be about 40 yards, and of 12 miles 9 yards, which in such country and under present circumstances is of no appreciable value, and this even would be materially affected by the very great uncertainty attending the precision of the astronomical results previously alluded to; so that I hope our definite action in the matter will be fully approved. The points being identified, they can be joined at any time with no greater difficulty than attends the running of a straight line between two fixed points over a rough country and sometimes for a considerable distance, but no scientific question would be involved in the operation which could be performed by any careful surveyor.

7. The above remarks lead me to request your Lordship's further consideration of the necessity of entering into a convention with the United States, supplementary to the Treaty of the 15th June 1846, declaratory of the Boundary marked out by the joint Commission being the Boundary of the Treaty notwithstanding any possible departures from the actual line of the Forty-ninth Parallel. The more than probability that such departures unavoidably exist is alluded to above, and in previous reports; and the necessity for a supplementary Convention was suggested by me in the concluding paragraph of my letter No: 28 of the 4th August 1862, and recognized by Her Majesty's Government in a letter from the Treasury to Mr. Hammond

dated 26th September 1862.

8. In conclusion, I have only to repeat previous recommendations that some certain steps should be taken to preserve the Boundary marks laid down at such large cost of time, labour and money. This cannot of course be done without some occasional and special expenditure for the purpose, as it ought not to be left to accidental opportunities; but it is very probable that the country which was almost inaccessible in 1858–62 is now more or less traversed along the greater part of the frontier line; and the labour of a few Woodsmen under the supervision of the Colonial Survey Department, for the maintenance of the stone cairns, and the preservation of the forest cuttings, would not be very costly. In the more accessible parts as opportunities offer, it would be very desirable to substitute permanent monuments of some simple character for the dry stone pyramids and I presume this could be done by concert with the public authorities in the adjoining United States territories. The obelisk at Point Roberts should be also duly maintained, and the iron pillars on the western section of the line occasionally painted. By these simple means the permanence of the Boundary would be ensured. Trusting that my proceedings will meet with your approbation, I have the honour to be

Your Lordship's most obedient humble servant

J. S. Hawkins, Colonel Rl. Engrs. H. M. Commissioner.

The Right Honble.

The Secretary of State for Foreign Affairs, &c. &c. &c.

ASTRONOMICAL DETERMINATIONS

[No. 1—Table of Astronomical and Geodetical Stations located and determined by the United States and British Commissions from which the 49th Parallel of North Latitude was defined. (To accompany Protocol of Proceedings of the Joint Commission dated Washington, May 7th, 1869)]

Name of points	Latitude north	Longitude west of Greenwich	Name of points	Latitude north	Longitude west of Greenwich
	0 / //	0 / //		0 / //	0 / //
Obelisk at Initial Point	49 00 00, 0	123 03 53.0	Camp Newhoialpitkwn	48 59 04.3	118 44 28.5
Camp Semiahmoo Observatory	49 00 43, 1	122 45 30.0	Inchuintum Station		118 28 12.3
British Station	49 00 00.0	122 37 01.6	Camp Statapoosten	49 00 10.8	118 16 15.6
Camp Sumass and Station	49 01 25.8	122 11 52.8	Camp Columbia	48 59 50.4	117 37 41.8
Camp Tummeahai	49 02 04.9	121 47 34.4	Fort Shepherd Station	49 00 00.0	117 37 19.
Senehsai Station Ensahkwatch Station	49 00 34.3	121 36 15.4	Pend d'Oreille Station	49 00 03.5	117 21 52.
Ensahkwatch Station	49 00 30.0	121 30 41.8	Kootenay Mountain Station	49 00 12.8	117 10 48.4
Camp Chiloweyuck	49 00 22.2	121 23 41.8	Camp Kootenay West	48 59 55.1	116 31 16.
Camp Chiloweyuck Camp Chucheheum	49 00 03.7	121 16 41.4	Camp Mooyie	49 01 26.0	116 12 40.
Camp SkagitRoche Station	49 00 02.3	121 02 45.2	Feild d Ofeline Station Kootenay Mountain Station Camp Kootenay West Camp Mooyie Yahk Station	48 59 55.4	115 38 51.
Roche Station	48 59 49.8	120 39 14. 8	Camp Rootenay East	40 09 44. 0	110 11 19.
Camp Pasayten	48 59 42.6	120 32 12.8	Wigwam Station		
Naisnuloh Station		120 00 18.8	Camp Kishenehu	49 00 02.8	
Camp Similkameen	48 59 12.1	119 34 53.2	Camp Akamina and Station	49 00 52.0	114 03 34.
Camp Osoyoos and Osoyoos Station	49 00 09.9	119 24 12.0			

SAMUEL ANDERSON,

Lieut. Royal Engrs., Secretary for Captain Haig, A. R,

Chief Astronomer.

J. S. HAWKINS,

Colonel Rl. Engrs.,

H. B. M. Commissioner.

7th May, 1869.

ARCHIBALD CAMPBELL,

U. S. Commissioner,

&c. &c. &c.

May 7, 1869.

Endorsed; 2,

In Colonel Hawkins, May 10, 1869.

LONGITUDES AND DESCRIPTIONS OF MONUMENTS

[No. 2—Table of Longitudes of Monuments marking the 49th Parallel of North Latitude. (To Accompany Protocol of Proceedings of the Joint Commission dated Washington, 7th May, 1869)]

From what station determined	Longitude west of Green wich	- Description of Mark	No. of Mark	Location
Camp Semiahmoo Observatory.	0 / " 123 03 53.0 03 02.9 02 12.7 00 42.9	Obelisk Iron pillar	1 2 3 4	On west face of Point Roberts. On flat east of obelisk, Point Roberts. On ridge. On east side of Point Roberts.
British Station.	122 43 59.9 42 20.5 41 22.7 40 04.1 38 45.5 37 26.9 37 01.6	Iron pillar	5 6 7 8 9 10	Near high-water mark, Semiahmoo Bay. On small ridge between swamps. On flat west of Ravine. On flat west of Ravine. On slope south of trail. On first bench south of trail. Latitude mark, British Station.
British Station.	122 36 08.5 34 46.7 33 27.7 32 13.7 31 05.1 30 07.9 29 37.2 28 32.9 27 19.3 25 04.1 24 22.7 23 05.9 22 20.7 21 47.6 20 29.4 19 55.1 19 08.9	Iron pillar	12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28	On flat near stream and south of trail. On flat south of trail. On ridge south of trail and stream. On flat north of trail and stream. On ridge west of Seh-ko-mehl Creek. On trail crossing line west of Sekomehl Creek. On edge of slope west of swamp and south of trail. On belt of timber between swamps. On slightly elevated ground west of creek. On flat south of trail. On trail crossing boundary line east side of creek. On flat north of trail. On trail crossing line. On flat crossing line. On trail crossing line. On trail crossing line. On trail crossing line. On trail crossing line.
British Station.	122 18 00.6 16 29.1 15 04.1 14 01.0 12 55.2 12 46.3 11 52.8		29 30 31 32 33 34 35	On hill 20 chains east of trail crossing line. On flat north of trail and west of swamp. On top of hill west of swamp and on trail crossing line. On trail crossing line. On Whatcom trail west side Sumass River. On east side Sumass River. Latitude mark, Sumass.

LONGITUDES AND DESCRIPTIONS OF MONUMENTS—Continued

From what station determined	Longitude west of Green- wich	Description of Mark	No. of Mark	Location
Sumass Station and Camp.	0 / " 122 11 00.8 10 02.7 8 38.4 7 50.4 7 21.7 6 31.9 5 26.6 4 45.2	Iron pillar	36 37 38 39 40 41 42 43	On mound east of latitude mark. On flat east of stream. On bench west of stream. On face of hill, 5 chains from base and near trail. On bench above rocky precipice east of trail. On top of mountain east side Sumass prairie. On bench at base of hill. On de Lacy's trail, Whatcom to Fort Hope, crossing line.
Camp Tummeahai	121 43 58.1 43 31.6 42 56.3	Pyramid of stones	44 45 46	On side of mountain west of falls of creek. On side of mountain south of creek. On side of mountain south of creek.
Sen-eh-say Station.	121 35 28.4	Pyramid of stones	47	On east side of Senehsay River.
Ensawkwatch Station.	121 30 21.2 30 08.4	Bench mark Pyramid of stones	48 49	On west side of Ensawkwatch River. On east side of Ensawkwatch River.
Camp Chiloweyuck.	121 23 48.5 23 11.0	Pyramid of stones	50 51	On west side of Klahaihu Valley. On east side of Klahaihu Valley.
Camp Chuckchehum.	121 18 57.3 16 56.2 16 41.4	Pyramid of stones	52 53 54	East of and near trail to Skagit. West of and near trail to Skagit. At foot of mountain south of camp.
Camp Skagit	121 04 22.2 02 26.6	Pyramid of stones	55 56	Outside of mountains west side of Skagit Valley. On side of hill east of Skagit Valley.
Roche Station.	120 39 47. 2 38 51. 9	Pyramid of stones	57 58	On hill side west of station. On hill side east of river.
Camp Pasayten.	120 32 29.3 32 00.9	Pyramid of stones	59 60	On slope west side of Pasayten Valley. On bench east of Pasayten Valley.
Naisnuloh Station.	120 00 46.1 119 59 57.9 58 38.7	Pyramid of stones	61 62 63	On sharp ridge west side of stream. East and near to stream. On flat east side of stream.
Camp Similkameen and Camp Osoyoos.	119 42 20.9 40 32.7 39 56.6 37 45.9 36 14.6 33 24.0 29 52.6 28 48.0	Pyramid of stones	64 65 66 67 68 69 70 71	At foot of mountains west side Similkameen Valley. On left bank of Similkameen. On summit of isolated mountain of Similkameen. East of and near trail up Similkameen. On summit of ridge east of trail up Similkameen. On southern slope of a rocky knoll. On plateau north of Similkameen. Near divide between Osoyoos and Similkameen and near junction of trails. West of trail up west bank of Lake Osoyoos.
Camp Osoyoos and Camp Newhoial- pitkwn,	119 24 08.9 22 37.6 21 26.4 18 58.1 17 10.4 14 27.2 11 56.5 10 18.4 9 32.8 8 02.8	Pyramid of stones	73 74 75 76 77 78 79 80 81 82	East of trail up east bank of Lake Osoyoos. Summit of first ridge east of Lake Osoyoos. On spur from mountain to the north. On spur from mountain to the north. North and west of small creek. South-east of Colville trail. North of Small Lake. On first bench west of fork of Rock Creek, In valley of fork of Rock Creek, west bank. On summit east of fork of Rock Creek.
Camp Osoyoos and Newhoialpitkwn.	119 6 15.0 4 36.0 2 54.9 1 23.0 118 59 33.6	Pyramid of stones	83 84 85 86 87	On rocky ridge east of Small Lake. On high plateau south of Rock Creek. On high plateau south of Rock Creek. On high plateau south of Rock Creek. On sigh plateau south of Rock Creek. On valley east of wagon road to Rock Creek.
Camp Osoyoos and (1869) Camp Nehoial-pitkwn.	118 56 58.9 55 58.2 55 05.0 53 06.6 52 26.6 51 14.9 48 27.3 46 45.6 45 48.9 45 12.6	Pyramid of stones	88 89 90 91 92 93 94 95 96 97	On summit east of waggon road to Rock Creek. On ridge between two creeks. On same ridge. On same ridge. On same ridge. On point of ridge south and east of creek. In valley of Nehoialpitkwn. On point of ridge in bend of Nehoialpitkwn. At foot of mountain right bank of Nehoialpitkwn.
Camp Nehoialpitkwn and Inchuintum Sta- tion.	118 44 13.8 43 24.5 42 38.4 41 49.6 40 57.2 39 51.5 38 24.9 36 43.4 33 43.0 31 28.4 29 48.7 28 40.8	Pyramid of stones	98 99 100 101 102 103 104 105 106 107 108 109	East of and near Colville Trail. In open country east of Rock Creek. At northern slope of mountains. At northern slope of mountains. On sharp ridge between heads of tributary of Rock Creek. On divide between Rock Creek and Newhoialpitkwn. On summit between two creeks. On first bench west of Small Creek. On first plateau west of river.

LONGITUDES AND DESCRIPTIONS OF MONUMENTS—Continued

From what station determined	Longitude west of Green- wich	Description of Mark	No of Mark	Location
Inchuintum Station and Camp Statapoosten.	0 / " 118 27 40.8 26 32.6 25 38.2 24 07.2 22 18.6 21 36.3 18 45.4 16 36.7	Pyramid of stones	110 111 112 113 114 115 116 117	In valley near and east of Colville Trail. In valley of Newhoilpitkwn south of river. In valley of Newhoilpitkwn south of river. In valley of Newhoilpitkwn south of river. On high ridge south of river. On north slope of mountains south of river.
Camp Statapoosten.	118 14 21.0 13 19.1 11 56.1 09 58.2 09 26.0 05 15.8 03 17.1 01 52.2 117 59 00.9 53 08.1 45 49.5 41 17.7 38 49.1 37 36.2 37 05.2	Pyramid of stones	118 119 120 121 122 123 124 125 126 127 128 129 130 131	On point of ridge right side of valley. In valley near trail to Colville. On a gravel ridge west of river. On side of mountain east of Nehoialpitkwn River. On hill west side of stream. On hill between streams. On slope between streams. On slope between streams. On side of hill between streams. On hill top west of Camp Columbia. On brink of hill west bank Columbia River. Near east bank of river.
Fort Shepherd Station.	117 36 59, 4	Pyramid of stones	133	Near east bank of Columbia River.
Pend d'oreille R. Sta- tion.	117 21 52.9 22 03.0 22 54.8	Pyramid of stones	136 135 134	Latitude mark, Pend d'oreille Station. On bench west side of river. On high ridge west.
Kootenay Mountain Station.	117 09 56. 5 08 55. 9	Bench mark_ Pyramid of stones	137 138	On face of rock ridge east. On bench, west side, south fork Salmon River.
Camp Kootenay, West.	116 35 44.9 31 05.9	Pyramid of stones	139 140	On side of mountain west side of valley. On brow of first hill right bank river.
Camp Mooyie, Mooyie trail monument.	116 14 59, 2	Pyramid of stones	141	On trail leading from the north to Chelemta.
Camp Mooyie.	116 12 22, 3 11 54 11 25, 6 11 24	Pyramid of stones	142 143 144 145	On side of mountain west side of valley. Approximate on plateau above creek. On left bank of creek close to water. Approximate on high bluff west bank.
Yahk Station.	115 39 46.5 39 24.5 39 10.5 38 29.5 38 02.8	Pyramid of stones	146 147 148 149 150	On west side of river. On west side of river. Near east bank of river. On hill side east of river. On hill side east of river.
Camp Kootenay, E., 1869.	115 16 01.4 11 11.2 10 11.6 3 28.7	Pyramid of stones	151 152 153 154	On east brink ravine beyond which the mountains rise. On right bank Kootenay River. On second plateau, left bank river. At foot of mountains left bank small creek.
Wigwam Station.	114 45 16.1 45 42.0	Pyramid of stones	156 155	Near west bank of river. On hill west of river.
Camp Kishenehu.	114 28 02.5 27 09.4 21 17.3 20 53.9	Pyramid of stones	157 158 159 160	On second terrace left bank Flathead River. On first bench right bank Flathead River. Near trail entering Boundary Pass. On left bank of Kishenehu Creek.
Akamina Camp and Station.	114 03 28.41	Pyramid of stones	161	On the Divide of the Rocky Mountains.

SAMUEL ANDERSON,

Lieut. Royal Engrs., Secretary for Captain Haig, R. A., Chief Astronomer.

Endorsed: 3.

In Colonel Hawkins.

May 10th, 1869.

J. S. HAWKINS,

Colonel Royal Engrs.,

H. B. M. Commissioner, May 7th, 1869

ARCHIBALD CAMPBELL,

U. S. Commissioner,

&c. &c. &c. May 7th, 1869.

OFFICIAL DESCRIPTION OF THE BOUNDARY

In the absence of the final report of the United States Commissioner, the final report of the British Commissioner and the protocol of February 24th, 1870, signed by Hamilton Fish and Sir Edward Thornton seem to be the only evidence as to what constitutes the official description of this boundary line as surveyed and marked by the Commissioners of 1857–69 and as agreed upon in the protocol just referred to. From these records it appears that the two sets of seven original maps jointly signed by the Commissioners on May 7, 1869, and the agreements of the Commissioners contained in the minutes of the meeting, together with the two tables of geodetic coordinates attached to these minutes and jointly signed by the two Commissioners on May 7, 1869, constitute the entire official description of this boundary line.

While the two sets of seven signed maps are usually considered to be duplicates, this is not strictly true. "The two sets of seven Maps" were "prepared severally by the respective commissions" and upon comparison the British maps were found to "require some trifling corrections of detail and the addition of some names common to the two sets." In relation to these corrections, Lieutenant S. Anderson, secretary to the British Commission, in a letter of July 22, 1869, directed to Edmund Hammond, Under Secretary of State, Foreign Office, says:

I have the honour to inform you that I deposited with Mr. Hertslet at the Foreign Office on the 17th inst: the series of *Maps* of the North American Boundary Commission amounting in all to 21 sheets, that had been left in my charge for the purpose of making certain alterations and additions that had been noted during the verification of the series with the American Maps at Washington. The corrections required have been made to all the maps except the series bearing the signatures of Colonel Hawkins and the American Commissioner, which are the joint maps of the Commission.

The corrections and additions required to make the joint maps agree with the American maps have not been made, as Mr. Byrgne instructed me to make no alterations in the maps, over the signatures of the Commissioners. A list of the corrections, &c., required is forwarded herewith, as a record of errata and addenda to be referred to whenever the maps are consulted. I beg to add that the American Commissioner in order to save time, signed our maps subject to the corrections, then only made in pencil on the maps, being properly made in ink on our return to this Country, and the list of corrections required as per accompanying list, mentioned above, was prepared in the presence of the American Chief Astronomer.

The list of corrections shows nothing more than minor corrections in the topography and names, and not being useful except in conjunction with the maps is here omitted.

In addition to the two sets of seven jointly signed official maps, each section of the Commission produced other finished maps which are filed with their Governments.

Those of the United States section of the Commission include an index map, a general map of the eastern section, and a general map of the western section. There are also copies of the seven detailed maps that finally became the official signed maps of May 7, 1869. The drawing of these seven maps appears to have been practically completed about the beginning of 1865. In 1866 a photographic copy of them was furnished to the General Land Office of the United States, accompanied by tables of the geographic coordinates of the camps, stations, and monuments. It is from these Land Office records that Marcus Baker obtained the data for the tables listed under the heading "From American Sources" which are given in his "Survey of the North-

western Boundary of the United States," Geological Survey Bulletin No. 174. It will be noted by comparison that the tables as thus given differ somewhat from the tables signed by the Commissioners in 1869 and can be considered only as preliminary and subject to correction. The seven detailed maps were also reproduced by photolithography at some time prior to the time of their adoption by the Commission in 1869. The reproduction was made on twice the scale of the original drawing (i. e., 1:60,000). They were printed by the New York Lithographing, Engraving, and Printing Company, Julius Bien, Superintendent. The size of the edition does not appear. This reproduction must also be considered as preliminary.

In regard to British maps of the survey, Commissioner Hawkins, in a letter to E. Hammond, Under Secretary of State, Foreign Office, dated April 30, 1864, says:

I did not overlook the instructions conveyed to me in your letter of the 29th September last respecting the deposit of the maps &c. if possible in some fireproof building previously to their being finally authenticated by the joint Commission. Though not fireproof, this office is I hope safe from fire; but it is necessary to have the maps at hand while they remain incomplete.

On their being quite finished I intend to submit to Earl Russell a proposition to obtain a few copies of them, for public use and record, by means of the photo-zincographic process which can I believe be readily done at the Ordnance Survey establishment at Southampton at very small cost; after which, on their being bound up, and merely awaiting authentication by the joint Commission they might be deposited in the Foreign Office, or at such other place as his Lordship might approve.

The maps are again the subject of discussion in the following letter written by Commissioner Hawkins.

H. M. Boundary Commission, New York, 15th May, 1869.

My Lord,—In the 2nd paragraph of my letter of the 10th instant reporting the closing proceedings of the joint Commission for the determination of the Land Boundary between the British Possessions and the United States under the Treaty of the 15th June, 1846, I stated upon the completion of some corrections and additions to the maps they would be conveyed to the Foreign Office by Lieut: Anderson R. E. secretary of the Commission to be disposed of as your Lordship should direct.

2. The maps consist of a set of seven, which are authenticated by the counter-signature of the United States Commissioner and are those alluded to in the 2nd article of the closing protocol; —of a set of six showing the Boundary upon the larger scale of one inch to a mile, which would be of more general use than the smaller maps, and by which the Boundary marks and forest cuttings, &c., are more distinctly shown so that by means of them the points on the Boundary could be more easily identified; of an index map in two sheets; and of a general map in three sheets, showing the whole Boundary from the Lake of the Woods to the Gulf or Straits of Georgia, which was compiled from the best data at our command when it was prepared. There are also three title pages for the two sets of Boundary Maps and the General Map making 21 sheets in all.

3. I beg respectfully to recommend to your Lordship that the whole of these maps be carefully mounted on cloth and bound together as the official record of the execution of so much of the Treaty as relates to the Land Boundary. I have directed Lieut: Anderson to have an index sheet of the positions of the Astronomical Stations and Boundary marks prepared, to be bound up with the maps, and I beg also to suggest that one or two sheets of photographic representations of the Obelisk at Point Roberts, of the stone cairn at the Eastern terminus of the Boundary on the Watershed of the Rocky Mountains, and of the cairns and cuttings at several intermediate points be bound up with them, for which object I have desired the necessary preparations to be made.

4. I learn from Lieut: Anderson that all the maps were photo-zincographed at the Ordnance Survey Office, Southampton, before being brought by him to this country. Copies of them will be very valuable for various purposes and in several of the public offices, such as the Foreign and Colonial Offices, the Topographical Office, and for use in the Colony of British Columbia; and I therefore think that owing to the alterations above alluded to fresh plates of at least the joint maps will be necessary. The cost of them will I believe not be very large; and it is most desirable that the copies should be fac-similes of the Authenticated Maps. The additions to the index and general Maps are of less importance, but of them too accurate copies are to be preferred, and would I think be worth the expense.

5. A very interesting representation of the entire Boundary would be obtained by a set of the joint maps being mounted in a roll, the sheets being joined together at the common meridians so as to shew the continuous line of Boundary and the curve of the Parallel. This might be kept

with the original maps, in a tin case.

6. I have undertaken to recommend to your Lordship that a complete set of copies of the British maps be sent to the State Department of the United States for deposit with their own original maps, as a complete record of our joint operations—to which I hope your Lordship will be pleased to accede;—and I venture further to suggest that those maps be also mounted and bound. Mr. Campbell the U. S. Commissioner has intimated his intention to supply us with copies of such of the American maps as may be photographed.

I have the honour to be,

Your Lordship's most obedient humble servant

J. S. Hawkins Colonel Rl. Engrs. H. M. Commissioner.

The Right Honble.

The Secretary of State for Foreign Affairs &c. &c. &c.

On July 22, 1869, the secretary to the British Commission, Mr. Anderson, writes of the final disposal of the British maps in the letter which has already been quoted on page 208.

It will be noted from these letters that Commissioner Hawkins recommended that "a complete set of the copies of the British Maps be sent to the State Department of the United States * * *." This recommendation was carried out on June 23, 1871, by the British Minister in Washington, Sir Edward Thornton, by the delivery to the State Department of an atlas entitled:

Maps of the land boundary between the British possessions in North America and the United States as established by the treaty of Washington, 15th June, 1846, and surveyed and marked under the direction of the Joint Commission appointed to carry into effect the 1st article of the treaty. Scale 1:120,000, or 1.8939 statute miles to one inch. Photo-zincographed at the ordnance survey office, Southampton, under the superintendence of Cap't. Parsons, R. E., F. R. A. S.; Col. Sir Henry James, R. E., F. R. S., etc., director, 1869.

It is from this atlas that Mr. Baker copied the data for tables II and III, geodetic coordinates under the heading "From British Sources", in his "Survey of the Northwestern Boundary of the United States." The tables as contained in the atlas differ slightly from the tables signed by the Commissioners on May 7, 1869, and are probably a copy of the British tables before comparison and correction at the Joint Conference of the Commissioners of May 7, 1869.

A study of the records, data, and maps, both preliminary and final, that have been described in the preceding pages makes possible a fairly accurate description of the methods and results of the field work.

METHODS AND RESULTS OF FIELD WORK

In the absence of any previous geodetic surveys in the country traversed by this section of the boundary, astronomic observations for latitude had to be made in order to determine the parallel of forty-nine degrees. Such observations were made at selected stations within easily measurable distances of the parallel. The observations were made with great care and a high degree of precision was attained. Many of the stations were observed by both sections of the Commission and the work of one checked against that of the other. After the latitude of the station had been determined, a point on the parallel was established by measuring the required distance north or south, as the case might be, from the station to the parallel.

The boundary was then traced along the parallel from the established point by the method of offsets from the tangent to the parallel, the tangent being determined by means of astronomic observations for azimuth. Twenty-nine latitude stations were established in this manner between Point Roberts and the summit of the Rocky Mountains. These stations are listed together with their latitudes and longitudes in the table on page 205.

The longitudes of some of the stations were obtained by observations of the moon's culmination. From these stations other longitudes were obtained by carrying chronometers between the stations for comparison of the observed time of the known station and of the station to be determined. Measured distances between monuments established along the boundary were also used to obtain differences of

longitude.

In all these geodetic operations the computations were based on Bessel's spheroid.

The boundary was established and marked from these astronomic latitude stations at varying intervals and for varying distances as the character of the country and proximity of settlements seemed to demand.

From the western shore of Point Roberts to the western base of the Cascade Mountains, a distance of about 45 miles, the line was established continuously and

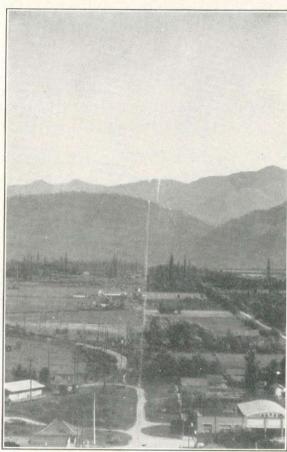
marked by cutting a vista and by setting 1 granite and 42 cast-iron monuments. This portion of the line was determined from 4 latitude stations.

Through the rugged and unsettled Cascade Mountains the parallel was determined and marked for a short distance only at each of nine stream crossings. An astronomic latitude was observed to determine the parallel at each of these places. The unmarked intervals between them varied from 4 to 24 miles. These nine latitude stations were not connected with each other by surveys.

East of the Cascade Mountains, beginning at the Similkameen River and extending to the most eastern crossing of the Kettle River, the line traverses a broken and rolling country with many fine open valleys and fertile uplands. Colonel Hawkins, the British Commissioner, says of it:

The country westward [from Lake Osoyoos] to the Similkameen and eastward for a long distance, though hilly or even mountainous yet being generally open, with only occasional patches of forest, and being very suitable for such an operation it was determined to run and mark the Boundary line in conformity with the proposition made by me to the United States Commissioner at the joint Commission meeting in April, 1859 [see agreement of Commissioners, p. 199.] though it was not then adopted or even entertained by him. The valley of the Newhoialpitkw [Kettle River], which the Boundary reaches at a distance of 9 miles from Lake Osoyoos and which it follows generally for a further distance of nearly 50 miles, is of very great importance; traversed as it is by the "brigade trail" of the Hudson's Bay Company, forming the high road between this part of the Columbia River district and the Fraser and Thompson Rivers, and being in fact one of the main arterial lines of communication in the country, in use probably by the Indians for ages. The mining settlement of Rock creek, at the junction of that tributary with the main stream (itself a tributary of the Columbia into which it flows 2 miles above Fort Colville) has recently been formed on the banks of the river; and a waggon road leads to it from the Dalles by the valleys of the Columbia and Okanagan Rivers, by which route goods are introduced into British Columbia. Other Auriferous streams near the Boundary have also been more or less worked within British and United States territory.—Furthermore, the valley contains a large extent of grazing land, which is available also though perhaps it may not be very suitable for agricultural purposes; and settlers are beginning to appear, though their permanency is probably dependent on the market offered to them by the uncertain wants of an erratic gold-seeking population. From these considerations it would appear that if the actual Boundary was to be defined by the joint Commission in any part of the space intervening between the waters of the Pacific and the Rocky Mountains, the interval between the Similkameen and the Columbia Rivers is not only of as much importance as, if it be not of greater importance than, any other part of the line; but it also presented greater facilities for the performance of the necessary operations, while it embraces about a fourth of the whole extent of Land Boundary comprehended in the Treaty under which the Commission was appointed.

Following his convictions regarding this section of the boundary, Colonel Hawkins proceeded to locate and mark it throughout. Seven latitude stations were established



THE BOUNDARY LINE EAST FROM MONUMENT 31. THE TWO VISTAS ON THE FAR RIDGE ILLUSTRATE A GREAT DEFLECTION OF THE LINE DUE TO "STATION ERROR" OF LATITUDE STATIONS. THE LEFT HAND, OR NORTH VISTA, IS WHERE THE LINE WOULD HAVE FALLEN HAD THERE BEEN NO "STATION ERROR." THE RIGHT HAND, OR SOUTH VISTA, IS ON THE LINE AS ESTABLISHED BETWEEN LATITUDE STATIONS. THE FAR RIDGE IS ABOUT 14 MILES FROM THE CAMERA

along this part of the line, and the observations were made by the astronomers of both sections of the Commission.

Beginning at astronomic station "Osoyoos", on the east bank of Osoyoos Lake, the British party ran the parallel westward to the Similkameen River, marking it, as they went, with pyramids of stones. At the Similkameen River the line thus run fell 509 feet to the north of the monument set from station "Similkameen" by the United States party. Proceeding eastward from station "Osoyoos", the British party ran the parallel, marking it as before with pyramids of stones, as far as the western crossing of the Newhoialpitkwn, or Kettle River, where it closed 364 feet to the north of the parallel as established from latitude station "Newhoialpitkwn."

The British parties also ran the parallel both east and west from astronomic station "Inchiuntum" at the second crossing of the Kettle River. The westward line fell 300 feet to the south of the astronomic determination at the western crossing of the Newhoialpitkwn, and 664 feet south of the line as brought from station "Osoyoos." The eastward line fell 180 feet north of the parallel, as

established from station "Statapoosten", at the most eastern crossing of the Newhoialpitkwn or Kettle River. This line, from the Similkameen to the most eastern crossing of the Kettle River, about 70 miles in length, was marked with 55 pyramids of stones about 6 feet square and 8 feet high placed at the most prominent and suitable points, and a continuous vista was cut between the pyramids wherever timber occurred.

This work was completed late in December 1860, and while not satisfactory to the British astronomers no corrections or modifications of the line could be made until the following spring.

Concerning these discrepancies, Commissioner Hawkins, in a letter dated April 12, 1861, says:

I stated that the Boundary so carefully and completely defined and marked by Captn. Haig and Lieut: Anderson in the past season, between the Similkameen and the western intersection of the Newhoialpitkw at Statapoosten would require revision. This necessity arises from the connections made between the various British and American points on the Boundary derived from the astronomical operations at the several stations showing great and unexpected discrepancies in the latitude of the points. The results of the astronomical operations by both Commissions seem to be in the highest degree satisfactory; the points on the 49th parallel derived from those results are not liable to errors which can be detected at the stations them selves; the country through which the connections have been made is of a generally favourable character; and the method of connection does not permit of errors at all approaching in magnitude the discrepancies found to exist. There seems to be no way of explaining these discrepancies except by attributing them principally to local causes affecting the astronomical observations similar to those vitiating the determinations at Schweltza 3 alluded to in paragraph 16 of my despatch No. 9 dated 21st May, 1860; and which probably affect more or less every station between the sea and the Rocky Mountains. Two ways of dealing with this difficulty presented themselves either to connect the adjacent stations by curves representing and having the properties of the 49th parallel (there being no apparent reason for preferring or rejecting the determination of any one of the stations) which might have been the preferable method had there been grounds for suspecting the accuracy of the manner of making the connections, and which will be followed in revising the line between Semiahmoo and Sumass; or to adopt a mean parallel from the continuation of the several astronomical results and their connections, from that mean to correct the result obtained at each station and to run, and mark a parallel coinciding with those corrections. There are two British and three U. S. determinations of latitude in the space of nearly 65 miles, from between the Similkameen River and Osoyoos Lake, to Statapoosten, the greatest discrepancy is between the British station at Osoyoos and the U. S. station at Statapoosten, which differ about 860 ft; and none of the stations agree within less than about 180 ft which is the difference between Statapoosten and the British station at Inshwointum. In this case, the first plan would certainly not produce a parallel of latitude and thus would knowingly fail to fulfil the provisions of the Treaty—The second plan would result in a parallel which would probably be the nearest approach to an accurate determination of the 49th parallel that any but a very elaborate and extended course of observation could arrive at. Captn. Haig has written at length to Mr. Airy the Astronomer Royal on the subject of these unwelcome and very unexpected discrepancies and on the method of dealing with them. At a meeting at this place on the 4th of March, attended by Lieut: Parke, the U. S. Chief Astronomer, in the absence of the Commissioner, Mr. J. S. Harris, one of the U. S. assistant Astronomers, Captn. Haig and myself—the above question, and the plan of this year's operations were discussed; and it was agreed that a mean parallel should be adopted, and a new line run and marked from the Similkameen to Statapoosten-This Lieut: Parke has undertaken to do, on the part of the U. S. Commission, on satisfying himself as to the existence and amount of the alleged discrepancies.

The running of the mean parallel from the Similkameen to the most eastern crossing of the Kettle River was carried out by Lieutenant Parke as planned, during the summer of 1861. The mean parallel was marked with pyramids of stones at points corresponding to the points marked on the original line and the pyramids marking the original line were torn down with the exception of one on the high hill just south of the present town of Midway, which was overlooked. The vista on the mean parallel, however, was not cut continuously; it was cut only across the summits of the ridges and in proximity to the pyramids. The effect of this was that two lines were left marked upon the ground—the abandoned line well marked by a continuous vista and with the remains of the demolished cairns, and the final or official line which was left poorly marked by a vista though well marked by stone

³ The discrepancy between the Schweltza and the Sumass Station was 8 seconds of latitude, about 800 feet, in a distance of about 9 miles. Although this discrepancy was apparently due to local station deflection of the plumb line at Schweltza, the latitude of Schweltza was discarded.

pyramids. This dual marking resulted in much local confusion in the years following and continued down to the present day. In a number of places the old stone piles and the vista of the original line are still plainly discernible.

Between the most eastern crossing of the Kettle River and the Columbia River the line was run on the approximate curve of the 49th parallel from the eastern terminus of the mean parallel to the astronomic determination of the parallel on the west bank of the Columbia. This section of the line was marked continuously with stone pyramids and a vista cut through the timber.

From the Columbia River eastward to the summit of the Rocky Mountains the parallel was marked at the crossing of the Pend-d'Oreille (Clark Fork) for a distance of about 1 mile, at the crossing of South Fork Salmon River for about 1 mile, at the western crossing of the Kootenai for about 4 miles, at the Moyie River crossing for about 3 miles, at the crossing of the North Fork of the Yaak River for about 1 mile, across the valley of the eastern crossing of the Kootenai for about 10 miles, at the crossing of the Wigwam River for about one-half mile, across the valley of the Flathead for about 5 miles, and finally by a cairn on the crest of the watershed of the Rocky Mountains high above the timber line. None of these intermittent markings were connected by surveys; in each case the parallel was determined from an independent astronomic station.

It will be noted from the foregoing paragraphs that the boundary as established was located from astronomic observations for latitude and was intended to follow the astronomic 49th parallel. That it does not strictly do so is shown by the discrepancies found to exist between the latitude stations connected with each other. It is now known through recent surveys that discrepancies of like character and of varying magnitude, attributed to local deflections of the plumb line, exist between the astronomic stations that were not connected with each other in the original survey, and that at best the whole line is but an approximation of the astronomic 49th parallel. However, the adverse conditions of transportation and travel through what was at that time a sparsely settled wilderness fully justified the original Commissioners in locating and marking the various portions of the line in the manner in which they did.

In addition to the work of locating and marking the boundary a great amount of work was required to collect the data for compiling the final maps of the Commission. Elevations of a large number of points were determined by barometric observations. Small schemes of triangulation were executed from time to time, streams and trails were traversed, and mountain points were cut in from the traverses. All this work was done in great detail as is evidenced by the maps themselves.

This concludes the brief outline of the work of establishing the boundary west of the Rocky Mountains by the Commission of 1857–1869.

Boundary East of the Summit of the Rocky Mountains

This section of the boundary was first defined in the second article of the convention between the United States and Great Britain of October 20, 1818, whereby it was provided:

* * that a Line drawn from the most North Western Point of the Lake of the Woods, along the forty Ninth Parallel of North Latitude, or, if the said Point shall not be in the Forty Ninth Parallel of North Latitude, then that a Line drawn from the said Point due North or South as the Case may be, until the said Line shall intersect the said Parallel of North Latitude, and from the Point of such Intersection due West along and with the said Parallel shall be the Line of Demarcation between the Territories of the United States, and those of His Britannic Majesty, and that the said Line shall form the Northern Boundary of the said Territories of the United States, and the Southern Boundary of the Territories of His Britannic Majesty, from the Lake of the Woods to the Stony Mountains.

It was again defined in the second article of the Webster-Ashburton Treaty of 1842 as:

* * to the said most northwestern point [of Lake of the Woods], being in latitude 49°23′55″ north, and in longitude 95°14′38″ west from the Observatory at Greenwich; thence, according to existing treaties, due south to its intersection with the 49th parallel of north latitude, and along that parallel to the Rocky Mountains.

Great Britain had proposed the demarcation of this section of the boundary at the time the demarcation of the boundary west of the Rocky Mountains was undertaken. The general instructions of date of March 30, 1858, issued by his Government to Captain Hawkins mentions the proposal in the following paragraph:

It is possible that you will hereafter be required to continue the survey from that point [Rocky Mountains] to the Lake of the Woods. Her Majesty's Government have made a proposal to that effect to the Government of the United States, but whether the proposal is accepted or not you will have in all probability sufficient work to occupy you for two seasons in surveying the Boundary under the Treaty of 1846.

By the act of Congress of March 19, 1872, entitled "An act authorizing the survey and marking of the boundary between the territory of the United States and the possessions of Great Britain, from the Lake of the Woods to the summit of the Rocky Mountains", the President of the United States was authorized to cooperate with the Government of Great Britain in the appointment of a Joint Commission for determining the boundary line between the United States and the British possessions, between Lake of the Woods and the Rocky Mountains. The immediate cause of this authorization by Congress was set forth by the President of the United States in his annual message to Congress dated December 5, 1870, as follows:

In April last, while engaged in locating a military reservation near Pembina, a corps of United States engineers discovered that the commonly-received boundary-line between the United States and the British possessions at that place is about forty-seven hundred feet south of the true position of the forty-ninth parallel, and that the line, when run on what is now supposed to be the true position of the forty-ninth parallel, would leave the fort of the Hudson Bay Company, at Pembina, within the territory of the United States. This information being communicated to the British Government, I was requested to consent, and did consent, that the British occupation, of the fort of the Hudson Bay Company should continue for the present. I deem it important however, that this part of the boundary-line should be definitely fixed by a joint commission of the two governments, and I submit herewith estimates of the expense of such a commission on the part of the United States, and recommend that an appropriation be made for that purpose. The land-boundary has already been fixed and marked from the summit of the Rocky Mountains to the Georgian Bay. It should now be in like manner marked from the Lake of the Woods to the summit of the Rocky Mountains.

Mr. Archibald Campbell, who had been Commissioner on the joint survey west of the summit of the Rocky Mountains, was appointed by the President as United States Commissioner. Great Britain appointed Capt. Donald R. Cameron, R. A., as British Commissioner.

Joint field operations were begun by the Commission about the middle of September 1872, at Pembina, on Red River. Field operations were completed late in the autumn of 1874.

At the close of the field work of the Commission, the United States section of the Commission set up offices in Washington for the purpose of working up the notes of the survey and compiling the maps of the boundary line and the country adjacent thereto. The British section of the Commission returned to London and there executed their office work.

In March 1876, the British Commissioner notified the United States Commissioner that the work of the British section of the Commission was ready for the final meeting of the Joint Commission and requested that if convenient the meeting be held in London. Accordingly, the joint meeting was held in London during the months of April and May 1876. The United States and British Chief Astronomers compared the records and maps of the respective sections of the Commission, and having reported them satisfactory and the maps ready for the signatures of the Commissioners, the maps were duly signed, together with a protocol of the final proceedings of the Commission on May 29, 1876. This completed the work of the Joint Commission and it adjourned sine die.

FINAL PROCEEDINGS OF THE COMMISSION

The final records and maps of the Commission are on file in the Foreign Office at London and in the archives of the Department of State in Washington. They are enumerated in a protocol of the final proceedings of the Commission of which the following is a copy:

RECORD OF PROCEEDINGS AT A MEETING OF THE COMMISSIONERS APPOINTED RESPECTIVELY BY THE PRESIDENT OF THE UNITED STATES OF AMERICA, AND BY HER BRITANNIC MAJESTY, TO ASCERTAIN AND MARK THE BOUNDARY-LINE BETWEEN THE RESPECTIVE TERRITORIES OF THE UNITED STATES AND OF HER MAJESTY, THE SAID LINE BEING THAT DEFINED BY THE SECOND ARTICLE OF THE CONVENTION OF LONDON, SIGNED OCTOBER 20, 1818

Present:

Donald R. Cameron, major Royal Artillery, commissioner on the part of Her Britannic Majesty.

S. Anderson, captain Royal Engineers, chief astronomer to Her Majesty's commission. A. C. Ward, captain Royal Engineers, secretary to Her Majesty's commission. Archibald Campbell, commissioner on the part of the United States of America.

W. J. Twining, captain of the Corps of Engineers of the United States Army, chief astronomer to the United States commission.

1. The chief astronomers submit the following documents and maps:

a. A detailed list in duplicate of forty astronomical stations, in addition to one for the location of the most northwestern point of the Lake of the Woods, at which observations were taken under their superintendence, to determine the line described in the second article of the convention of London (signed October 20, 1818) between the terminal points, viz, the most northwestern point of the Lake of the Woods and the eastern end of the international boundary-line previously marked between Akamina, in the Rocky Mountains, and the western coast of North America.

b. A descriptive list in duplicate of three hundred and eighty-eight (388) monuments and marks placed on the boundary-line, as derived from the astronomical stations enumerated in

the list referred to in section a of this paragraph.

c. A duplicate set of twenty-four (24) maps on a scale of 1/126720, or 1 inch to 2 miles, illustrating the topography of the country through which the boundary-line runs, and indicating

the relative positions of the various monuments and marks referred to in section b of this para-

graph.
2. The second article of the convention of London, signed 20th October, 1818, is read, as

follows:

"It is agreed that a line drawn from the most northwestern point of the Lake of the Woods, along the forty-ninth parallel of north latitude, or if the said point shall not be in the fortyninth parallel of north latitude, then that a line drawn from the said point due north or south, as the case may be, until the said line shall intersect the said parallel of north latitude, and from the point of such intersection due west, along and with the said parallel, shall be the line of demarkation between the territories of His Britannic Majesty and those of the United States, and that the said line shall form the southern boundary of the said territories of His Britannic Majesty, and the northern boundary of the territories of the United States, from the Lake of the Woods to the Stony Mountains.

The duplicate documents and maps enumerated in paragraph numbered one (1)—one set for each of the respective governments—having been examined and compared, are authenticated

by the signatures of the commissioners, who agree as follows:

1. The three hundred and eighty-eight (388) monuments detailed in the list referred to in section b of paragraph numbered one, are on and mark the astronomical lines stipulated by the second article of the convention of London (signed October 20, 1818) to be the line of boundary between the territories of Her Britannic Majesty and of the United States of America, from the Lake of the Woods to the Stony (i. e., Rocky) Mountains.

2. In the intervals between the monuments along the parallel of latitude, it is agreed that the line has the curvature of a parallel of 49° north latitude; and that such characteristic shall determine all questions that may hereafter arise with reference to the position of the boundary at

any point between neighboring monuments.

3. It is further agreed that, in the event of any of the said three hundred and eighty-eight (388) monuments or marks being obliterated beyond the power of recognition, the lost site or sites shall be recovered by their recorded position relatively to the next neighboring unobliterated mark or marks.

ARCHIBALD CAMPBELL, United States Commissioner, London, May 29, 1876.

D. R. CAMERON, Major, R. A., Her Britannic Majesty's Commissioner, London,

The United States Commission made a very full and detailed report to the Department of State on the work of the Joint Commission. A limited edition of this report was printed under the title "Survey of the Northern Boundary of the United States from the Lake of the Woods to the Summit of the Rocky Mountains", The 24 official, signed maps were also reproduced and printed. Copies of this report and of the maps are on file in the archives of the Department of State, in the Library of Congress, and in other governmental offices in Washington.

The British Commissioner, Major Cameron, likewise made a report to his Government, which together with 3 appendixes are on file in the Foreign Office in London. A limited edition of Major Cameron's official report, without the appendixes, was printed for the use of the Foreign Office, August 1876, marked "Confidential", under the heading "North American Boundary Commission from the most North-Western Point of the Lake of the Woods to the Stony Mountains."

Should the reader desire a detailed description of this section of the boundary and its survey, it is available in the records and reports that have been referred to herein.

APPENDIX IV

ELEVATIONS ALONG THE 49TH PARALLEL BOUNDARY

ELEVATIONS AND DESCRIPTIONS OF BENCH MARKS

Under this heading are given the elevations and descriptions of all permanent bench marks established or used in the survey of the International Boundary from Georgia Strait to the Northwesternmost Point of Lake of the Woods. The list includes bench marks of the Geodetic Survey of Canada, the United States Coast and Geodetic Survey, the United States Geological Survey, and of other agencies of the two Governments. Following this list is a list of elevations of the ground at boundary monuments along several sections of the boundary where level lines were run but no permanent bench marks were established.

The elevations of the bench marks of the Geodetic Survey of Canada are given as published in 1929 and 1930 ¹ and these elevations were used as the basis for the reduction to a common datum of the elevations of all the other bench marks listed. All of the elevations here listed are in feet and are referred to mean-sea-level datum as defined in the Geodetic Survey of Canada publications of 1929 and 1930 above referred to.

THE WASHINGTON-BRITISH COLUMBIA LINE

International Boundary Monument 5, 7 feet west of; at Blaine, Whatcom County, Wash.; ½ mile north of the Great Northern Railway station, 40 feet east of the railway track; Geodetic Survey of Canada first-order bench mark, a copper bolt marked "G. S. C. B. M. 19–J" set horizontally in the north face of a concrete bench-mark pier	Elevation (feet)
Blaine, Whatcom County, Wash.; in a stone step on the north side of the main entrance to Blaine Hotel; an aluminum disk marked "U. S. Geological Survey B. M. 41–B." It is also United States Coast and Geodetic Survey first-order bench mark I–6.	42. 235
Blaine, Whatcom County, Wash., 4 miles east of; at the northeast corner of sec. 3, T. 40 N., R. 1 E., in the southwest angle of the forks of the road; iron post with bronze cap marked "U. S. Geological Survey B. M. 452–B"	453. 6
Blaine, Whatcom County, Wash., 7 miles east of; at the northwest corner of sec. 5, T. 40 N., R. 2 E., on the south side of the east-and-west road, 1 foot north of the fence and 38 feet east of the center of the north-and-south road between sections 5 and 6; iron post with bronze cap marked "U. S. Geological Survey B. M. 180-B".	181. 2
Blaine, Whatcom County, Wash., 11 miles east of; about ¼ mile east of the northwest corner of sec. 1, T. 40 N., R. 2 E., in the southwest angle of the forks of the road; iron post with bronze cap marked "U. S. Geological Survey B. M. 124-B"	125. 3
Northwood, Whatcom County, Wash., 1 mile south and 6½ miles west of Sumas, Wash.; 15 feet north and 30 feet east of the quarter-section corner between secs. 3 and 10, T. 40 N., R. 3 E.; in the southeast angle of the crossroads; iron post with bronze cap marked "U. S. Geological Survey	
В. М. 132-В"	133. 5

¹ Precise Levelling in Manitoba (Publication No. 21), Precise Levelling in Saskatchewan (Publication No. 22), Precise Levelling in Alberta (Publication No. 23), and Precise Levelling in British Columbia (Publication No. 24), Geodetic Survey of Canada, 1929 and 1930.

 $^{^2}$ The United States Coast and Geodetic Survey has leveled on this bench mark and has designated it "H-6" in their bulletins.

Clearbrook, Whatcom County, Wash., on the Bellingham & Northern R. R., 3 miles southwest Sumas, Wash.; 150 feet southeast of the railway station; in the northeast angle of the highwand railway crossing; iron post with bronze cap marked "U. S. Geological Survey B. M. 66-B	vay
International Boundary Monument 31, 9.8 feet east of; at Sumas, Whatcom County, Was Huntingdon, Fraser Valley District, B. C.; a bronze disk marked "U. S. Geological Survey B. 202–B" set in a granite boulder flush with the surface of the ground	M.
Sumas, Whatcom County, Wash.; 10 feet south of the International Boundary and west of Seattle & International Railway, at the northeast corner of the United States immigration but ing (in 1905); iron post with bronze cap marked "U. S. Geological Survey B. M. 48-B"	ild-
Lamberton, Whatcom County, Wash., 1½ miles south and a little east of Sumas, Wash.; at highway crossing of the Bellingham & Northern Railroad, northeast of the railway static iron post with bronze cap marked "U. S. Geological Survey B. M. 43-B"	on;
Huntingdon, Fraser Valley District, B. C.; in southeast or front concrete foundation wall of put school, 3 feet 5 inches from the southerly corner and 5 feet 4 inches below the woodwork; Geode Survey of Canada first-order bench mark No. 26–J, a copper bolt set horizontally and mark "G. S. C., B. M. 26–J"	etic
International Boundary Monument 32; ½ mile east of the main corners of the village of Hu ingdon, Fraser Valley District, B. C., near Sumas, Whatcom County, Wash.; Geodetic Survof Canada first-order bench mark, a copper bolt marked "G. S. C., B. M. 27–J", set vertice near the north edge of the concrete base.	vey
Pasayten River crossing of the International Boundary, Okanogan County, Wash., Yale Distr B. C., between Monument 85 and Monument 86; 300 feet east of river, 10 feet east of tr in the boundary vista; iron post with bronze cap marked "U. S. Geological Survey B. M. 33 T. U. L."	rail, 853
Similkameen River valley, Okanogan County, Wash., Yale District, B. C., 0.6 mile south a 0.3 mile east of International Boundary Monument 109, 3 feet east of the highway along west side of the valley; iron post with bronze cap marked "U. S. Geological Survey B. M. 1197"	the
International Boundary Monument 112, 0.3 mile west of; 2 miles east of Similkameen River, O nogan County, Wash., Yale District, B. C.; iron post with bronze cap marked "U. S. Geologi Survey B. M. 1371"	ical
Oroville, Okanogan County, Wash.; southeast corner of lot at corner of Main and River Street iron post with bronze cap marked "U. S. Geological Survey B. M. 928–T"; it is also a U. S. County and Geodetic Survey first-order bench mark	ets; past
International Boundary Monument 118, 2 feet south of; Okanogan County, Wash., Yale Distr B. C.; iron post with bronze cap marked "U. S. Geological Survey B. M. 1058-T"	rict,
Molson, Okanogan County, Wash., about 1.8 miles northeast of; 945 feet south of the Internatio Boundary Line, 21 feet west of the Great Northern Railway track, 102 feet north of a road croing, and 50 feet east of the fence line; United States Coast and Geodetic Survey first-order bermark, a bronze disk set in the top of a concrete post and marked "U. S. Coast & Geodetic Survey bench mark X-22"	onal oss- nch
Bridesville, Yale District, B. C.; ¾ mile southwest of the railway station, in a small rock cut the Great Northern Railway, 66 feet south of the 15th telegraph pole south of milepost 93 fr Marcus; Geodetic Survey of Canada first-order bench mark, a bronze disk set horizontally the west side of the rock cut 1 foot above the track level and marked "Geodetic Survey of Canaba. M. 857–J".	om in
³ This bench mark was disturbed by repairs made to the monument in 1922. The elev-	ation given has

³ This bench mark was disturbed by repairs made to the monument in 1922. The elevation given has been corrected for the change in elevation.

⁴ This elevation was determined by the United States Geological Survey, Bulletin No. 674, 1918. There are at present no data available for referring this elevation to the 1929 datum of the Geodetic Survey of Canada.

⁵ On an unchecked spur line.

⁶ Elevation approximate.

Bridesville, Yale District, B. C.; 3 miles south of the railway station, in a small rock cut on the Great Northern Railway, 142 feet south of the 14th telegraph pole north of milepost 96 from Marcus and 417 feet north of the International Boundary; Geodetic Survey of Canada first-order bench mark, a bronze disk set horizontally in the west side of the cut and marked "Geodetic Survey of Canada B. M. 858-J".	Elevation (feet) 3, 572. 311
Bridesville, Yale District, B. C.; 3 miles south of the railway station, 47 feet west of Great Northern Railway track, 41 feet south of 14th telegraph pole north of milepost 96 from Marcus, and 237 feet north of the International Boundary Line; Geodetic Survey of Canada first-order bench mark, an iron pipe with bronze cap, set in the ground, and marked "Geodetic Survey of Canada B. M. 859-J"	3, 584. 873
International Boundary Monument 132, 0.2 mile west of; Okanogan County, Wash., Yale District, B. C.; 600 feet west of Myers Creek, and on the east side of the highway; iron post with bronze cap marked "U. S. Geological Survey B. M. 2631-T"	2, 621. 7
Midway, Yale District, B. C.; 5 miles west of Canadian Pacific Railway station; in top of north concrete pier near west or upstream end of highway bridge over Kettle River; Geodetic Survey of Canada first-order bench mark, a bronze disk marked "Geodetic Survey of Canada B. M. 423–J"	1, 929. 036
Midway, Yale District, B. C.; at milepost 2 west of Canadian Pacific Railway station; 50 feet east of a private crossing and 3 feet north of the southerly limit of the railway right-of-way; Geodetic Survey of Canada first-order bench mark, a bronze disk set in the top of a concrete pier and marked "Geodetic Survey of Canada B. M. 424-J"	1, 910. 863
International Boundary Monument 142, Yale District, B. C., Ferry County, Wash.; Geodetic Survey of Canada first-order bench mark, a bronze disk in top of and near the north edge of the concrete base of the monument, marked "Geodetic Survey of Canada B. M. 425-J"	1, 997. 569
Midway, Yale District, B. C.; ¾ mile east of Canadian Pacific Railway station; 160 feet east of milepost 126 from Nelson, and 500 feet west of a road crossing, in the center of the north face of a tile pipe culvert under the Canadian Pacific Railway; Geodetic Survey of Canada first-order bench mark, a bronze disk marked "Geodetic Survey of Canada B. M. 426–J"	1, 915. 222
Midway, Yale District, B. C., 2¾ miles northeast of; 40 feet north of the Canadian Pacific Railway track, beside a water course at mileage 123.9 from Nelson; Geodetic Survey of Canada first-order bench mark, a bronze disk set in the south face of a rock ledge, and marked "Geodetic Survey of Canada B. M. 427–J"	2, 095. 308
International Boundary Monument 155, at Carson, Yale District, B. C., and near Danville, Ferry County, Wash.; about 300 feet west of the Great Northern Railway; Geodetic Survey of Canada first-order bench mark, a bronze disk set in the top of the concrete base near the north edge and marked "Geodetic Survey of Canada B. M. 442-J".	1, 733. 537
Danville, Ferry County, Wash., about 2 miles east by northeast of; on the Great Northern Railway, directly south of Grand Forks, 0.4 mile north of the International Boundary, 0.5 mile west of the spur track to Grand Forks, on the south side of the track, 20 feet from the south rail; in the top of the granite post 10 by 10 by 48 inches set 36 inches in the ground to mark "Danville west base" triangulation station; bronze bench-mark disk set beside the copper bolt which marks the triangulation station.	1, 751
Danville, Ferry County, Wash., about 3 miles east by northeast of; on the Great Northern Railway, directly south of Grand Forks, 0.4 mile north of the International Boundary, 0.6 mile east of the spur track to Grand Forks, on the south side of the track, 20 feet from the south rail; in the top of the granite post 10 by 10 by 48 inches set 36 inches in the ground to mark "Danville east base" triangulation station; bronze bench-mark disk set beside the copper bolt which marks the triangulation station.	1, 733
Grand Forks, Yale District, B. C.; in the west foundation wall of the post office, 12 feet from the southwest corner and 2 feet 7 inches below the brickwork; Geodetic Survey of Canada first-order bench mark, a bronze disk marked "Geodetic Survey of Canada B. M. 440–J"	1, 691. 391
Grand Forks, Yale District, B. C.; in the concrete foundation of the east wall of the courthouse, 45 feet from the northeast corner and 5 feet below the brickwork; Geodetic Survey of Canada first-order bench mark, a bronze disk marked "Geodetic Survey of Canada B. M. 441-J"	1, 689. 694

Grand Forks, Yale District, B. C.; on the abutment of the railway bridge over Kettle River, ¾ mile east of the Canadian Pacific Railway station, at milepost 94 from Nelson; in the north end of the east face of the west concrete abutment, 6 feet above the bridge seat; Geodetic Survey of Canada	Elevation (feet)
first-order bench mark, a bronze disk marked "Geodetic Survey of Canada B. M. 439-J"	1, 699. 385
Grand Forks, Yale District, B. C.; in retaining wall of railway bridge over Kettle River, 2½ miles east of the Canadian Pacific Railway station, at mileage 92.3 from Nelson; in the north stone wall at the east end of the bridge; in top of first stone east of the abutment; Geodetic Survey of Canada first-order bench mark, a bronze disk marked "Geodetic Survey of Canada B. M. 443–J".	1, 695. 307
Gilpin, Yale District, B. C., 1½ miles west of the west switch; at mileage 88.8 from Nelson, on the Canadian Pacific Railway, at a highway bridge over the track; in the center of the south face of the north abutment, about 1 foot above the track level; Geodetic Survey of Canada first-order bench mark, a bronze disk marked "Geodetic Survey of Canada B. M. 444-J"	1, 726. 374
Gilpin, Yale District, B. C., 1 mile east of the east switch; 240 feet east of milepost 86 from Nelson, on the Canadian Pacific Railway, 500 feet east of a road crossing and 3 feet north of the southerly limit of the railway right-of-way; Geodetic Survey of Canada first-order bench mark, a bronze disk set in the top of a concrete bench-mark pier and marked "Geodetic Survey of Canada B. M. 445-J"	1, 669. 312
Billings, Yale District, B. C., ½ mile west of the Canadian Pacific Railway station; at mileage 83.4 from Nelson, 600 feet west of a road crossing, at a rocky point touched by the railway; Geodetic Survey of Canada first-order bench mark, a bronze disk set in the south face of the rock and marked "Geodetic Survey of Canada B. M. 446–J"	1, 658. 461
Cascade, Yale District, B. C., ¾ mile west of the Canadian Pacific Railway station; at mileage 82.7 from Nelson; in the stone ballast wall on top of the east abutment of the railway bridge over Kettle River; Geodetic Survey of Canada first-order bench mark, a bronze disk set in the top of the wall near the north end and marked "Geodetic Survey of Canada B. M. 447–J"	1, 641. 882
Cascade, Yale District, B. C., ¾ mile east of the Canadian Pacific Railway station; at mileage 81.1 from Nelson; in the south face of the east abutment, above the bridge seat, of the bridge over Kettle River; Geodetic Survey of Canada first-order bench mark, a bronze disk marked "Geodetic Survey of Canada B. M. 448–J"	1, 537. 588
International Boundary Monument 165, 210 feet west of; at Laurier, Ferry County, Wash., and near Cascade, Yale District, B. C.; Geodetic Survey of Canada first-order bench mark, an iron pipe with a bronze cap set in the ground and marked "Geodetic Survey of Canada B. M. 860–J"	1, 649. 890
Laurier, Ferry County, Wash., Cascade, Yale District, B. C.; in a mass of rock 150 feet north of the International Boundary and 250 feet westerly from the Great Northern Railway track, at the road crossing immediately north of the Canadian customs office; Geodetic Survey of Canada first-order bench mark, a bronze disk set vertically in the top of the rock, near the highest point, and marked "Geodetic Survey of Canada B. M. 861-J"	1, 677. 195
International Boundary Monument 165, 3 feet south of; at Laurier, Ferry County, Wash.; between the Great Northern Railway and the Canadian customs office; United States Coast and Geodetic Survey first-order bench mark, a bronze disk set in the top of a concrete post and marked "U. S. Coast & Geodetic Survey bench mark Y-22, 1931"	1, 646. 674
International Boundary Monument 181, 5 feet east of; at Boundary, Stevens County, Wash., Waneta, Kootenay West District, B. C.; on the east bank of the Columbia River, 60 feet west of the Great Northern Railway track; iron post with bronze cap marked "U. S. Geological Survey B. M. 1356"; it is also a bench mark of the Geodetic Survey of Canada.	1, 348. 75
Waneta, Kootenay West District, B. C.; in abutment of Great Northern Railway bridge over Clark Fork (Pend-d'Oreille) River, about 600 feet south of the railway station; Geodetic Survey of Canada bench mark, a bronze disk set vertically in the bridge seat of the north abutment, near the southeast corner and marked "Geodetic Survey of Canada B. M. 19–T".	1, 348. 14
International Boundary Monument 188-A, 25 feet west of; at Nelway, Kootenay West District, B. C., 13 miles north of Metaline Falls, Wash.; on the west side of the Spokane-Nelson highway; a bronze disk set in the top of a concrete post and marked "U. S. Geological Survey B. M. R-55, 1930"; it is also Geodetic Survey of Canada bench mark R-55	2, 558. 40

⁷ The United States Coast and Geodetic Survey has leveled on this bench mark.

Nelway, Kootenay West District, B. C.; ¾ mile northwest of the Canadian customhouse; 24 fee north of the center line of the Waneta-Nelway road, ¼ mile west of the junction of a branch roa and 12 feet east of a fence extending from the road to the shore of a small lake; Geodetic Surve of Canada bench mark, an iron pipe with bronze cap marked "Geodetic Survey of Canada B. M. 27-T"	d, (feet)
	2, 020. 21
The Idaho-British Columbia Line Creston, Kootenay East District, B. C.; at the southeast corner of the "Creston House", the hotel property of S. J. Miller in 1904; United States Geological Survey bench mark, an iron powith bronze cap stamped "UNITED STATES BENCH MARK".	st
Creston, Kootenay East District, B. C., about 3 miles south of; 3.3 miles north of Porthill, Boundary County, Idaho; on the east edge of the right-of-way of the abandoned Great Northern Rai way, 30 feet east of milepost 29, and near the south end of trestle No. 14; United States Geologic Survey bench mark, an iron post with bronze cap stamped "UNITED STATES BENCE MARK"	l- al
Porthill, Boundary County, Idaho, 3½ miles north of; in a rock cut on the abandoned Great North ern Railway, 780 feet north of a trestle; Geodetic Survey of Canada first-order bench mark, copper bolt set horizontally in the east side of the rock cut near the south end, and marke "G. S. C. B. M. 197–D"	a
International Boundary Monument 207, at Porthill, Boundary County, Idaho; immediately ear of the abandoned Great Northern Railway; Geodetic Survey of Canada first-order bench mark a copper bolt set horizontally in the north face of the concrete base of the monument and market "G. S. C. B. M. 198-D"	c, d
International Boundary Monument 207, 4 feet west of; at Porthill, Boundary County, Idaho; United States Geological Survey bench mark, an iron post with bronze cap stamped "UNITED STATE BENCH MARK, Elev. 1794.124 feet." This is also United States Coast and Geodetic Survey first-order bench mark V-10	d S y
Porthill, Boundary County, Idaho, 2.8 miles south of; 38 feet east of the east rail of the Great Northern Railway track, 157 feet north of the north end of trestle No. 10, and at a fence ling near an old gate; United States Geological Survey bench mark, an iron post with bronze can stamped "UNITED STATES BENCH MARK, Elevation 1780.656 feet". This is also United States Coast and Geodetic Survey first-order bench mark U-10	p d
THE MONTANA-BRITISH COLUMBIA LINE	
International Boundary Monument 233, Lincoln County, Mont., Kootenay East District, B. C on the east side of North Fork of Yaak River, 0.2 mile west of the trail; United States Geologica Survey bench mark, a nail driven into the concrete on the south side of the base of the monument	il
Gateway, Lincoln County, Mont.; 90 feet west of the United States customhouse, on the International Boundary Line; United States Geological Survey bench mark, an iron post with bronz cap stamped "2355"	
Gateway, Lincoln County, Mont.; 0.2 mile south of the International Boundary Line, 119 feet wes of the west rail of the Great Northern Railway, in the top of the square granite post which mark triangulation station "Gateway north base"; a bronze disk stamped "2371"	S
Gateway, Lincoln County, Mont., 1.2 miles south of; 119 feet west of the west rail of the Grea Northern Railway in a rather deep cut, and about 115 feet north of an old house; in the top of the square granite post which marks triangulation station "Gateway south base"; a bronze distraction "2362 feet, datum G. N."	f
Flathead River valley, Flathead County, Mont.; 2.5 miles south of the International Boundary on the east side of the Flathead River, in the northwest quarter of sec. 23, T. 37 N., R. 22 W 10 feet north of the junction of the Flathead River trail and the Kishenehn trail as located in 1903; United States Geological Survey bench mark, an iron post with bronze cap stamped "3886"	1
International Boundary Monument 262, 15 feet west of; in the Flathead River valley, Flathead County, Mont., Kootenay East District, B. C.; 0.5 mile east of the Flathead River, 0.3 mile west of Sage Creek; United States Geological Survey bench mark, an iron post with bronze capstamped "4068".	t
8 This bench mark was slightly disturbed in 1930 and the elevation is now only approximate.	, , , , , ,

 $^{^8}$ This bench mark was slightly disturbed in 1930 and the elevation is now only approximate. 9 The Geodetic Survey of Canada has leveled on this bench mark.

THE MONTANA-ALBERTA LINE

Babb, Glacier County, Mont., about 5 miles north and a little east of; about 5 miles south of the International Boundary Line, in sec. 36, T. 37 N., R. 14 W., near the road and irrigation canal, about 0.4 mile northeast of Powell's ranch and about 0.4 mile east of a ford; iron post with bronze cap stamped "4467 G. N."	Elevation (feet) 4, 476. 4
Babb, Glacier County, Mont., about 6 miles northeast of; about 4 miles south of the International Boundary, in sec. 30, T. 37 N., R. 13 W., 1 mile west of Spider Lake, 20 feet north of the road; iron post with bronze cap stamped "4473 G. N."	0 4, 482. 2
Babb, Glacier County, Mont., about 7 miles northeast of; 3 miles south of the International Boundary, near the northeast corner of sec. 23, T. 37 N., R. 13 W., 1 mile east of Spider Lake, on a bluff on the south side of a ravine, about 800 feet south of a road; iron post with bronze cap stamped "4462 G. N."	o 4, 471. 8
Babb, Glacier County, Mont., about 12 miles northeast of; in sec. 19, T. 37 N., R. 12 W., 1.5 miles southwest of Galbreath's ranch, 100 feet east of the road; iron post with bronze cap stamped "4493 G. N."	0 4, 502. 7
Babb, Glacier County, Mont., about 10 miles northeast of; about 5 miles south of the International Boundary, on the highest point of the east end of the ridge between Galbreath Basin and the North Fork of Milk River, near the quarter-section corner on the south side of sec. 25, T. 37 N., R. 13 W.; "Galbreath" triangulation station, an aluminum bolt stamped "5196 G. N." set in a large granite boulder, which is flush with the surface of the ground	¹ 5, 205. 6
Babb, Glacier County, Mont., about 12 miles northeast of; in sec. 32, T. 37 N., R. 12 W., at Hall's ranch, in the yard, 15 feet south of the house; iron post with bronze cap stamped "4565 G. N."	² 4, 574. 6
Babb, Glacier County, Mont., about 16 miles northeast of; in sec. 21, T. 37 N., R. 12 W., about 3 miles south of the International Boundary, about 2 miles southeast of Galbreath's ranch, about 2 miles south of a group of small lakes; iron post with bronze cap stamped "4452 G. N."	0 4, 461. 6
Babb, Glacier County, Mont., about 14 miles northeast of; 1½ miles south of the International Boundary, in sec. 7, T. 37 N., R. 12 W., at Galbreath's ranch, in the yard in front of the house; iron post with bronze cap stamped "4284"	4, 285. 0
Emigrant Gap, Hudson Bay Divide, Glacier County, Mont.; 1½ miles south of the International Boundary; in the northwest quarter of sec. 8, T. 37 N., R. 11 W., 60 feet east of the road; iron post with bronze disk stamped "4473 G. N."	0 4, 482. 2
North Fork of Milk River, Glacier County, Mont., 0.7 mile south of; in northeast quarter of sec. 21, T. 37 N., R. 11 W., 30 feet east of the McLeod road; iron post with bronze disk stamped "4436 G. N."	¹⁰ 4, 445. 5
International Boundary Monument 288, 2 miles south of; Glacier County, Mont.; 0.5 mile northeast of Smith's ranch house, 0.3 mile east of a small lake, 60 feet from an old road, on the uphill side; iron post with bronze cap marked "U. S. & C. B. Survey, 4569"	4, 570. 2
International Boundary Monument 288, 10 feet west of; Glacier County, Mont., Lethbridge District, Alberta; iron post with bronze cap marked "U. S. & C. B. Survey, 4615"	4, 616. 2
International Boundary Monument 289, 10 feet west of; Glacier County, Mont., Lethbridge District, Alberta; iron post with bronze cap marked "U. S. & C. B. Survey, 4722"	4, 722. 9
International Boundary Monument 290, in base of; Glacier County, Mont., Lethbridge District, Alberta; bronze disk marked "U. S. & C. B. Survey B. M."	4, 499. 5
International Boundary Monument 291, 45 feet west of; Glacier County, Mont., Lethbridge District, Alberta; bronze disk set in solid rock and stamped "4430"	4, 431. 2
10 Established by the United States Reclamation Service. 11 On a spur line; not checked. Established by the United States Reclamation Service. 12 On a spur line. Established by the United States Reclamation Service.	

^{122824°—37——16}

International Boundary Monument 293, 10 feet west of; Glacier County, Mont., Lethbridge District, Alberta; iron post with bronze cap marked "U. S. & C. B. Survey, 4409"	Elevation (feet) 4, 410. 3
International Boundary Monument 294, 0.6 mile east of; Glacier County, Mont., Lethbridge District, Alberta; township corner between ranges 12 and 13 west, of the United States public lands survey; iron post with bronze cap stamped "4429"	4, 430, 2
International Boundary Monument 295, 10 feet west of; Glacier County, Mont., Lethbridge District, Alberta; iron post with bronze cap marked "U. S. & C. B. Survey, 4678"	4, 679. 3
International Boundary Monument 298, 10 feet west of; Glacier County, Mont., Lethbridge District, Alberta; iron post with bronze cap marked "U. S. & C. B. Survey, 4220"	4, 220. 8
International Boundary Monument 298, 1.2 miles east of; Glacier County, Mont., Lethbridge District, Alberta; on the range line between ranges 11 and 12 west, of the United States public lands survey; iron section corner post with bronze cap stamped "4288"	4, 289. 3
International Boundary Monument 300, 10 feet west of; Glacier County, Mont., Lethbridge District, Alberta; iron post with bronze cap marked "U. S. & C. B. Survey, 4628"	4, 629. 4
International Boundary Monument 301; Glacier County, Mont., Lethbridge District, Alberta; in the south side of the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 4416"	4, 416. 8
International Boundary Monument 302, 10 feet west of; Glacier County, Mont., Lethbridge District, Alberta; iron post with bronze cap marked "U. S. & C. B. Survey, 4296"	4, 297. 2
International Boundary Monument 302, ¼ mile east of; Glacier County, Mont., Lethbridge District, Alberta; township corner between ranges 10 and 11 west, of the United States public lands survey; iron post with bronze cap stamped "4305"	4, 305. 7
International Boundary Monument 303; Glacier County, Mont., Lethbridge District, Alberta; in the south side of the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 4511"	4, 511. 9
International Boundary Monument 304; Glacier County, Mont., Lethbridge District, Alberta; in the south side of the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 4490"	4, 491. 2
International Boundary Monument 305; Glacier County, Mont., Lethbridge District, Alberta; in the south side of the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 4484"	4, 484. 9
International Boundary Monument 306; Glacier County, Mont., Lethbridge District, Alberta; in the south side of the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 4446"	4, 447. 2
International Boundary Monument 306, 800 feet east of; Glacier County, Mont., Lethbridge District, Alberta; township corner between ranges 9 and 10 west, of the United States public lands survey; iron post with bronze cap stamped "4429"	4, 430. 3
International Boundary Monument 307; Glacier County, Mont., Lethbridge District, Alberta; in the south side of the top of the base of the monument; bronze disk marked "U. S. & C. B. Survey, 4367"	
International Boundary Monument 308; Glacier County, Mont., Lethbridge District, Alberta; in the south side of the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 4338"	4, 368. 3
International Boundary Monument 309; Glacier County, Mont., Lethbridge District, Alberta; in the south side of the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 4347"	4, 348. 2
International Boundary Monument 310; Glacier County, Mont., Lethbridge District, Alberta; in the south side of the top of the concrete base of the monument; iron post with bronze cap marked	
"U. S. & C. B. Survey, 4121"	4, 121. 6
2. The post with profize cap stamped 4057	4, 058. 2

International Boundary Monument 311; Glacier County, Mont., Lethbridge District, Alberta; in the south side of the top of the concrete base of the monument; iron post with bronze cap marked "U. S. & C. B. Survey, 4057"	Elevation (feet) 4, 057. 5
International Boundary Monument 312; Glacier County, Mont., Lethbridge District, Alberta; in the south side of the top of the concrete base of the monument; iron post with bronze cap marked "U. S. & C. B. Survey, 4005"	4, 005. 9
International Boundary Monument 313; Glacier County, Mont., Lethbridge District, Alberta; in the south side of the top of the concrete base of the monument; iron post with bronze cap marked "U. S. & C. B. Survey, 4051"	4, 051. 7
International Boundary Monument 314; Glacier County, Mont., Lethbridge District, Alberta; in the south side of the top of the concrete base of the monument; iron post with bronze cap marked "U. S. & C. B. Survey, 3983"	3, 984. 1
International Boundary Monument 314, ¼ mile east of; Glacier County, Mont., Lethbridge District, Alberta; township corner between ranges 7 and 8 west, of the United States public lands survey; iron post with bronze cap stamped "3949"	3, 949. 7
International Boundary Monument 315; Glacier County, Mont., Lethbridge District, Alberta; in the south side of the top of the concrete base of the monument; iron post with bronze cap marked "U. S. & C. B. Survey, 3923"	3, 924. 1
International Boundary Monument 316; Glacier County, Mont., Lethbridge District, Alberta; in the south side of the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 3964"	3, 964. 7
International Boundary Monument 317; Glacier County, Mont., Lethbridge District, Alberta; in the south side of the top of the concrete base of the monument; iron post with bronze cap marked "U. S. & C. B. Survey, 4026"	4, 026. 7
International Boundary Monument 318; Glacier County, Mont., Lethbridge District, Alberta; in the south side of the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 4024"	4, 024. 1
International Boundary Monument 318, ¾ mile east of; Glacier County, Mont., Lethbridge District, Alberta; township corner between ranges 6 and 7 west, of the United States public lands survey; iron post with bronze cap stamped "4003"	4, 003. 9
International Boundary Monument 319; Glacier County, Mont., Lethbridge District, Alberta; in the south side of the top of the concrete base of the monument; iron post with bronze cap marked "U. S. & C. B. Survey, 4025"	4, 026. 1
International Boundary Monument 320; Glacier County, Mont., Lethbridge District, Alberta; in the south side of the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 4407"	4, 407. 2
International Boundary Monument 321; Glacier County, Mont., Lethbridge District, Alberta; in the south side of the top of the concrete base of the monument; iron post with bronze cap marked "U. S. & C. B. Survey, 4282"	4, 282. 3
International Boundary Monument 322; Glacier County, Mont., Lethbridge District, Alberta; in the south side of the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 4282"	4, 282. 2
International Boundary Monument 323; Glacier County, Mont., Lethbridge District, Alberta; in the south side of the top of the concrete base of the monument; iron post with bronze cap marked "U. S. & C. B. Survey, 4069"	4, 069. 5
International Boundary Monument 324; Glacier County, Mont., Lethbridge District, Alberta; in the south side of the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 3963"	3, 963. 0
International Boundary Monument 325; Glacier County, Mont., Lethbridge District, Alberta; in the south side of the top of the concrete base of the monument; iron post with bronze cap marked "U. S. & C. B. Survey, 3899"	3, 899. 4

International Boundary Monument 326; Glacier County, Mont., Lethbridge District, Alberta; in the south side of the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 3763"	Elevation (feet)
International Boundary Monument 327; Toole County, Mont., Lethbridge District, Alberta; in the south side of the top of the concrete base of the monument; iron post with bronze cap marked "U. S. & C. B. Survey, 3634"	3, 634. 2
International Boundary Monument 328; Toole County, Mont., Lethbridge District, Alberta; in the south side of the top of the concrete base of the monument; iron post with bronze cap marked "U. S. & C. B. Survey, 3663"	3, 663. 4
International Boundary Monument 329; Toole County, Mont., Lethbridge District, Alberta; in the south side of the top of the concrete base of the monument; iron post with bronze cap marked "U. S. & C. B. Survey, 3648"	3, 648. 4
International Boundary Monument 330; 4.8 miles west of Sweetgrass, Toole County, Mont., and Coutts, Lethbridge District, Alberta; in the south side of the top of the concrete base of the monument; bronze triangulation disk marked "U. S. & C. B. Survey, 3587"	3, 587. 1
International Boundary Monument 331; 2.9 miles west of Sweetgrass, Toole County, Mont., and Coutts, Lethbridge District, Alberta; in the south side of the top of the concrete base of the monument; iron post with bronze cap marked "U. S. & C. B. Survey, 3571"	3, 571. 0
International Boundary Monument 332; 1.6 miles west of Sweetgrass, Toole County, Mont., and Coutts, Lethbridge District, Alberta; in the south side of the top of the concrete base of the monument; bronze triangulation disk marked "U. S. & C. B. Survey, 3495"	3, 495. 1
International Boundary Monument 333; at Sweetgrass, Toole County, Mont., and Coutts, Lethbridge District, Alberta; ½ mile west of the Great Northern Railway tracks, at a point on the concrete base 4 inches north of the monument shaft.	3, 550. 7
International Boundary Monument 334, at Sweetgrass, Toole County, Mont., and Coutts, Lethbridge District, Alberta; 80 feet east of the Great Northern Railway tracks; iron post with bronze cap set in the concrete base of the monument and marked "U. S. & C. B. Survey, 3466". It is also United States Coast and Geodetic Survey first-order bench mark H-12, and a first-order bench mark of the Geodetic Survey of Canada.	3, 466. 60
Coutts, Lethbridge District, Alberta; in a concrete pier (built originally for astronomic observations) 240 feet west of the Canadian Pacific Railway track, 1,050 feet north of the International Boundary and 150 feet south of Coutts post office; Geodetic Survey of Canada first-order bench mark 216-C, a copper bolt set horizontally in the north face of the pier	3, 491. 00
International Boundary Monument 335; ¾ mile east of Sweetgrass, Toole County, Mont., and Coutts, Lethbridge District, Alberta; in the north side of the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 3553"	3, 552. 1
International Boundary Monument 336; 2 miles east of Sweetgrass, Toole County, Mont., and Coutts, Lethbridge District, Alberta; in the north side of the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 3602"	3, 601. 0
International Boundary Monument 337; 3 miles east of Sweetgrass, Toole County, Mont., and Coutts, Lethbridge District, Alberta; in the north side of the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 3513"	3, 512. 2
International Boundary Monument 376, 1 mile east of; Hill County, Mont., in sec. 6, T. 37 N., R. 9 E.; a short distance south of the International Boundary Line, near the mouth of Kennedy's (or Canada) Coulee, 600 feet north of a log cabin, and 80 feet south of a ditch on the south side of Milk River; iron post with bronze cap marked "U. S. Geological Survey B. M. 2713 HAVRE"	2, 712. 5
THE MONTANA-SASKATCHEWAN LINE	
International Boundary Monument 396, 1,900 feet west of; Hill County, Mont.; 3 feet south of the township corner between ranges 13 and 14 east, of the United States public lands survey; iron post with bronze cap marked "U. S. Geological Survey B. M., 2821"	2, 822. 2
¹³ This bench mark is at the end of a 10-mile single-run spur line.	

146mm (BBC) [1] 12 [1] 12 [1] 14 [1] 15 [1]	
International Boundary Monument 398, about 1,900 feet west of; Hill County, Mont., Maple Creek District, Sask.; on the north line of sec. 4, T. 37 N., R. 14 E., of the United States public lands survey; on top of a hill 700 feet north of a coulee which runs northwest and southeast; iron post with bronze cap marked "U. S. Geological Survey B. M., 2835"	Elevation (feet) 2, 835. 7
International Boundary Monument 400, about 3,400 feet west of; Hill County, Mont., Maple Creek District, Sask.; 750 feet west of the northeast corner of sec. 1, T. 37 N., R. 14 E., of the United States public lands survey, and about 0.4 mile northeast of a deep coulee; iron post with bronze cap marked "U. S. Geological Survey B. M., 2849"	2, 850. 0
International Boundary Monument 402, 1,300 feet east of; Hill County, Mont., Maple Creek District, Sask.; 650 feet east of the northwest corner of sec. 3, T. 37 N., R. 15 E., of the United States public lands survey; iron post with bronze cap marked "U. S. Geological Survey B. M., 2781"	2, 781. 8
International Boundary Monument 403, 6 feet north of; Maple Creek District, Sask.; bolt in concrete block flush with ground, marked "C. 1908 B. M. 2738". Bench mark set by International Boundary Commission; elevation determined by United States Geological Survey	2, 752. 8
International Boundary Monument 403, about 1 mile south of; Hill County, Mont.; near the northeast corner of sec. 11, T. 37 N., R. 15 E.; about 600 feet south of a small coulee on the west side of Lodge Creek (West Fork Creek); iron post with bronze cap marked "U. S. Geological Survey B. M., 2745"	2, 746. 2
International Boundary Monument 403, 1.13 miles east of; Hill County, Mont., Maple Creek District, Sask.; 1 mile east of Lodge Creek (West Fork Creek), 400 feet west of the northeast corner of sec. 1, T. 37 N., R. 15 E., of the United States public lands survey; iron post with bronze cap marked "U. S. Geological Survey B. M., 2783"	2, 784. 1
International Boundary Monument 406, 6 inches south of; Hill County, Mont.; iron post with bronze cap marked "U. S. Geological Survey B. M., 2812"	2, 812. 5
International Boundary Monument 408, 1,840 feet west of; Hill County, Mont., Maple Creek District, Sask.; at the northwest corner of sec. 6, T. 37 N., R. 17 E., of the United States public lands survey; on the ridge between Woodpile Coulee a half mile to the east and another coulee a half mile to the west; iron post with bronze cap marked "U. S. Geological Survey B. M., 2824".	2, 824. 6
International Boundary Monument 410, 936 feet east of; Hill County, Mont.; 6 feet south of the northeast corner of sec. 4, T. 37 N., R. 17 E., of the United States public lands survey; iron post with bronze cap marked "U. S. Geological Survey B. M., 2876"	
International Boundary Monument 413, 700 feet west of; Blaine County, Mont., 40 feet south of the township corner between ranges 17 and 18 east, of the United States public lands survey; iron post with bronze cap marked "U. S. Geological Survey B. M., 2803"	2, 801. 8
International Boundary Monument 415, 1,750 feet east of; Blaine County, Mont., Maple Creek District, Sask.; 70 feet west of the northeast corner of sec. 4, T. 37 N., R. 18 E., of the United States public lands survey, near a small lake bed; iron post with bronze cap marked "U. S. Geological Survey B. M., 2885"	
International Boundary Monument 417, 10 feet south of; Blaine County, Mont.; 2,550 feet west of the northeast corner of sec. 1, T. 37 N., R. 18 E., of the United States public lands survey; iron post with bronze cap marked "U. S. Geological Survey B. M., 2894"	
International Boundary Monument 418, 10 feet south of; Blaine County, Mont.; 0.6 mile east of the township corner between ranges 18 and 19 east, of the United States public lands survey; iron post with bronze cap marked "U. S. Geological Survey B. M., 2909"	
International Boundary Monument 420, 1,600 feet west of; Blaine County, Mont., Maple Creek District, Sask.; about 0.6 mile east of East Fork of Milk River; about 1,900 feet east of northwest corner of sec. 3, T. 37 N., R. 19 E., of the United States public lands survey; iron post with bronze cap marked "U. S. Geological Survey B. M., 2844"	1

International Boundary Monument 420, beside; Blaine County, Mont., Maple Creek District, Sask.; 1,780 feet west of the northeast corner of sec. 3, T. 37 N., R. 19 E., of the United States public lands survey; iron post with bronze cap marked "U. S. Geological Survey B. M., 2859"	Elevation (feet) 2, 859. 6
International Boundary Monument 421, 1,340 feet east of; Blaine County, Mont., Maple Creek District, Sask.; 1,125 feet west of the northeast corner of sec. 2, T. 37 N., R. 19 E., of the United States public lands survey; iron post with bronze cap marked "U. S. Geological Survey B. M., 2844"	2, 844. 7
International Boundary Monument 423; Blaine County, Mont., Maple Creek District, Sask.; 1,640 feet east of the northwest corner of sec. 5, T. 37 N., R. 20 E., of the United States public lands survey; the southwest corner of the boundary monument	2, 795. 3
International Boundary Monument 423, about 2,000 feet east of; Blaine County, Mont., about 1,700 feet west of the northeast corner of sec. 5, T. 37 N., R. 20 E., of the United States public lands survey; 60 feet south of the Canadian section corner between sections 2 and 3, T. 1, R. 24 W., III meridian; iron post with bronze cap marked "U. S. Geological Survey B. M., 2790"	2, 791. 0
International Boundary Monument 424; Blaine County, Mont., Maple Creek District, Sask.; 400 feet east of the northeast corner of sec. 4, T. 37 N., R. 20 E., of the United States public lands survey; the southwest corner of the boundary monument.	2, 815. 8
International Boundary Monument 425, 6 feet south of; Blaine County, Mont.; 1,445 feet west of the northeast corner of sec. 2, T. 37 N., R. 20 E., of the United States public lands survey; iron post with bronze cap marked "U. S. Geological Survey B. M., 2883"	2, 883. 7
International Boundary Monument 427, about 2,000 feet east of; Blaine County, Mont.; about 1,200 feet west of the northeast corner of sec. 5, T. 37 N., R. 21 E., of the United States public lands survey; 80 feet south of the Canadian section corner between sections 2 and 3, T. 1, R. 23 W., III meridian; at the north edge of a coulee; iron post with bronze cap marked "U. S. Geological Survey B. M., 3106"	3, 106. 7
International Boundary Monument 429; Blaine County, Mont., Maple Creek District, Sask.; about 2,280 feet east of the northwest corner of sec. 2, T. 37 N., R. 21 E., of the United States public lands survey; the southwest corner of the boundary monument.	3, 379. 9
International Boundary Monument 429, 2,025 feet east of; Blaine County, Mont.; 974 feet west of the northeast corner of sec. 2, T. 37 N., R. 21 E., of the United States public lands survey; 70 feet south of the Canadian section corner between secs. 5 and 6, T. 1, R. 22 W., III meridian; iron post with bronze cap marked "U. S. Geological Survey B. M." (elevation not stamped)	3, 328. 5
International Boundary Monument 435, 1,571 feet west of; Blaine County, Mont., Maple Creek District, Sask.; at the township corner between ranges 22 and 23 east, of the United States public lands survey; iron post with bronze cap marked "U. S. Geological Survey B. M., HAVRE 3162"_	3, 162. 7
International Boundary Monument 436, beside; Blaine County, Mont., Maple Creek District, Sask.; stone painted "3007"	3, 007. 7
International Boundary Monument 437, 1,780 feet west of; Blaine County, Mont., Maple Creek District, Sask.; at the northeast corner of sec. 4, T. 37 N., R. 23 E., of the United States public lands survey; iron post with bronze cap marked "U. S. Geological Survey B. M., HAVRE 3016"_	3, 016. 5
International Boundary Monument 439, 1,650 feet west of; Blaine County, Mont., Maple Creek District, Sask.; at the township corner between ranges 23 and 24 east, of the United States public lands survey; at the north edge of a small intermittent lake; iron post with bronze cap marked "U. S. Geological Survey B. M., HAVRE 3072"	3, 071. 8
International Boundary Monument 441, 1,900 feet west of; Blaine County, Mont., Maple Creek District, Sask.; about 550 feet east of the northeast corner of sec. 3, T. 37 N., R. 24 E., of the United States public lands survey; iron post with bronze cap marked "U. S. Geological Survey B. M., HAVRE 3045"	3, 044. 2
International Boundary Monument 442, 580 feet east of; Blaine County, Mont., Maple Creek District, Sask.; about 215 feet east of the northwest corner of sec. 1, T. 37 N., R. 24 E., of the United States public lands survey; iron post with bronze cap marked "U. S. Geological Survey	
B. M., HAVRE 3045"	3, 044. 5

	Elevation
International Boundary Monument 477; Phillips County, Mont., Maple Creek District, Sask.; the southeast corner of the boundary monument	(feet) 2, 651, 5
International Boundary Monument 478; Phillips County, Mont., Maple Creek District, Sask.; in the south side of the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2724"	2, 717. 0
International Boundary Monument 479; Phillips County, Mont., Maple Creek District, Sask.; in the south side of the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2797"	2, 790. 3
International Boundary Monument 480; Phillips County, Mont., Maple Creek District, Sask.; in the south side of the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2758"	2, 752. 5
International Boundary Monument 481; Phillips County, Mont., Maple Creek District, Sask.; in the south side of the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2532"	2, 525. 6
International Boundary Monument 482; Phillips County, Mont., Maple Creek District, Sask.; in the south side of the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2484"	2, 477. 3
International Boundary Monument 483; Phillips County, Mont., Maple Creek District, Sask.; in the south side of the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2614"	2, 607. 8
International Boundary Monument 484; Phillips County, Mont., Maple Creek District, Sask.; in the south side of the top of the concrete base of the monument; iron post with bronze cap marked "U. S. & C. B. Survey B. M., 2997,"	3, 002. 5
International Boundary Monument 485; Valley County, Mont., Wood Mountain District, Sask.; in the south side of the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2990"	2, 983, 5
International Boundary Mountain 486; Valley County, Mont., Wood Mountain District, Sask.; in the south side of the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2980"; it is also a Geodetic Survey of Canada first-order bench mark	2, 973. 799
International Boundary Monument 486, 370 feet west of; Valley County, Mont., Wood Mountain District, Sask.; United States Coast and Geodetic Survey first-order bench mark, a bronze disk set in the top of a concrete post and marked "U. S. Coast & Geodetic Survey bench mark U-31"	2, 969. 676
International Boundary Monument 487; Valley County, Mont., Wood Mountain District, Sask.; in the south side of the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2832"	2, 826, 1
International Boundary Monument 488; Valley County, Mont., Wood Mountain District, Sask.; in the south side of the top of the concrete base of the monument; iron post with bronze cap marked "U. S. & C. B. Survey B. M., 2739"	2, 733. 1
International Boundary Monument 489; Valley County, Mont., Wood Mountain District, Sask.; in the south side of the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2818"	2, 811. 2
International Boundary Monument 490; Valley County, Mont., Wood Mountain District, Sask.; in the south side of the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2729"	2, 722. 2
International Boundary Monument 491; Valley County, Mont., Wood Mountain District, Sask.; in the south side of the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2680"	2, 673. 5
International Boundary Monument 492; Valley County, Mont., Wood Mountain District, Sask.; in the south side of the top of the concrete base of the monument; iron post with bronze cap marked "U. S. & C. B. Survey B. M., 2637"	2, 631. 0

International Boundary Monument 493; Valley County, Mont., Wood Mountain District, Sask.; the south side of the top of the concrete base of the monument; bronze disk marked "U. S. & C. Survey B. M., 2802"	(1001)
International Boundary Monument 494; Valley County, Mont., Wood Mountain District, Sask.; the south side of the top of the concrete base of the monument; bronze disk marked "U. S. & C. Survey B. M., 2681"	
International Boundary Monument 495; Valley County, Mont., Wood Mountain District, Sask.; the south side of the top of the concrete base of the monument; bronze disk marked "U. S. & C. Survey B. M., 2642"	В.
International Boundary Monument 496; Valley County, Mont., Wood Mountain District, Sask.; the south side of the top of the concrete base of the monument; bronze disk marked "U. S. & C. Survey B. M., 2587"	В.
International Boundary Monument 496, 450 feet south of; Valley County, Mont.; triangulate station "Rock Creek south base"; bronze disk set in concrete and marked "U. S. & C. B. Survey	
International Boundary Monument 497; Valley County, Mont., Wood Mountain District, Sask.; the south side of the top of the concrete base of the monument; bronze disk marked "U. S. & C. Survey B. M., 2660"	В.
International Boundary Monument 498; Valley County, Mont., Wood Mountain District, Sask.; the south side of the top of the concrete base of the monument; bronze disk marked "U. S. & C. Survey B. M., 2656"	
International Boundary Monument 499; Valley County, Mont., Wood Mountain District, Sask.; the south side of the top of the concrete base of the monument; bronze disk marked "U. S. & C. Survey B. M., 2706"	В.
International Boundary Monument 500; Valley County, Mont., Wood Mountain District, Sask.; the south side of the top of the concrete base of the monument; bronze disk marked "U. S. & C Survey B. M., 2724"	. B.
International Boundary Monument 501; Valley County, Mont., Wood Mountain District, Sas in the south side of the top of the concrete base of the monument; bronze disk marked "U. S. C. B. Survey B. M., 2734"	k.;
International Boundary Monument 502; Valley County, Mont., Wood Mountain District, Sas in the south side of the top of the concerete base of the monument; bronze disk marked "U. S. C. B. Survey B. M., 2883"	. &
International Boundary Monument 503; Valley County, Mont., Wood Mountain District, Sas in the south side of the top of the concrete base of the monument; bronze disk marked "U. S. C. B. Survey B. M., 2905"	. &
International Boundary Monument 504; Valley County, Mont., Wood Mountain District, Sas in the south side of the top of the concrete base of the monument; iron post with bronze cap mark "U. S. & C. B. Survey B. M., 3082"	k.; ted
International Boundary Monument 505; Valley County, Mont., Wood Mountain District, Sas in the south side of the top of the concrete base of the monument; iron post with bronze of marked "U. S. & C. B. Survey B. M., 3104"	ap
International Boundary Monument 506; Valley County, Mont., Wood Mountain District, Sas in the south side of the top of the concrete base of the monument; bronze disk marked "U. S. C. B. Survey B. M., 3029"	. &
International Boundary Monument 507; Valley County, Mont., Wood Mountain District, Sas in the south side of the top of the concrete base of the monument; bronze disk marked "U. S. C. B. Survey B. M., 3026"	k.;
International Boundary Monument 508; Valley County, Mont., Wood Mountain District, Sas in the south side of the top of the concrete base of the monument; iron post with bronze of marked "U. S. & C. B. Survey B. M., 2982"	k.; ap

International Boundary Monument 509; Valley County, Mont., Wood Mountain District, Sask.; in the south side of the top of the concrete base of the monument; iron post with bronze cap marked "U. S. & C. B. Survey B. M., 2859"	Elevation (feet) 2, 852. 0
International Boundary Monument 510; Valley County, Mont., Wood Mountain District, Sask.; in the south side of the top of the concrete base of the monument; iron post with bronze cap marked "U. S. & C. B. Survey B. M., 2971"	2, 967. 6
International Boundary Monument 511; Valley County, Mont., Wood Mountain District, Sask.; in the south side of the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2902"	2, 895. 3
International Boundary Monument 512; Valley County, Mont., Wood Mountain District, Sask.; in the south side of the top of the concrete base of the monument; iron post with bronze cap marked "U. S. & C. B. Survey B. M., 2929"	2, 922. 8
International Boundary Monument 513; Valley County, Mont., Wood Mountain District, Sask.; in the south side of the top of the concrete base of the monument; iron post with bronze cap marked "U. S. & C. B. Survey B. M., 2996"	2, 989. 9
International Boundary Monument 514; Valley County, Mont., Wood Mountain District, Sask.; in the south side of the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 3178"	3, 171. 6
International Boundary Monument 515; Valley County, Mont., Wood Mountain District, Sask.; in the south side of the top of the concrete base of the monument; iron post with bronze cap marked "U. S. & C. B. Survey B. M., 3048"	3, 041. 8
International Boundary Monument 516; Valley County, Mont., Wood Mountain District, Sask.; in the south side of the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2992"	2, 985. 3
International Boundary Monument 517; Daniels County, Mont., Wood Mountain District, Sask.; in the south side of the top of the concrete base of the monument; iron post with bronze cap marked "U. S. & C. B. Survey B. M., 3027"	3, 020. 6
International Boundary Monument 518; Daniels County, Mont., Wood Mountain District, Sask.; in the south side of the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 3017"	3, 010. 7
International Boundary Monument 519; Daniels County, Mont., Wood Mountain District, Sask.; in the south side of the top of the concrete base of the monument; iron post with bronze cap marked "U. S. & C. B. Survey B. M., 2993"	2, 986, 0
International Boundary Monument 520; Daniels County, Mont., Wood Mountain District, Sask.; in the south side of the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2966"	2, 959. 6
International Boundary Monument 521; Daniels County, Mont., Wood Mountain District, Sask.; in the south side of the top of the concrete base of the monument; iron post with bronze cap marked "U. S. & C. B. Survey B. M., 2939"	2, 932. 1
International Boundary Monument 522; Daniels County, Mont., Wood Mountain District, Sask.; in the south side of the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2875"	2, 868. 2
International Boundary Monument 523; Daniels County, Mont., Wood Mountain District, Sask.; in the south side of the top of the concrete base of the monument; iron post with bronze cap marked "U. S. & C. B. Survey B. M., 2856"	2, 849. 2
International Boundary Monument 524; Daniels County, Mont., Wood Mountain District, Sask.; in the south side of the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2782"	2, 774. 9

International Boundary Monument 525; Daniels County, Mont., Wood Mountain District, Sask.; in the south side of the top of the concrete base of the monument; iron post with bronze cap marked "U. S. & C. B. Survey B. M., 2808"	Elevation (feet) 2, 801. 2
International Boundary Monument 526; Daniels County, Mont., Wood Mountain District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2655"	2, 649. 8
International Boundary Monument 527; Daniels County, Mont., Wood Mountain District, Sask.; in the concrete base of the monument; iron post with bronze cap marked "U. S. & C. B. Survey B. M., 2572"	2, 567. 1
International Boundary Monument 528; Daniels County, Mont., Wood Mountain District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2549"	2, 543. 4
International Boundary Monument 529; Daniels County, Mont., Wood Mountain District, Sask.; in the concrete base of the monument; iron post with bronze cap marked "U. S. & C. B. Survey B. M., 2538"	2, 533. 0
International Boundary Monument 530; Daniels County, Mont., Wood Mountain District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2607"	2, 602. 1
International Boundary Monument 531; Daniels County, Mont., Wood Mountain District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2627"	2, 622. 1
International Boundary Monument 532; Daniels County, Mont., Wood Mountain District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2774"	2, 768. 3
International Boundary Monument 533; Daniels County, Mont., Wood Mountain District, Sask.; in the concrete base of the monument; iron post with bronze cap marked "U. S. & C. B. Survey B. M., 2809"	2, 803. 0
International Boundary Monument 534; Daniels County, Mont., Wood Mountain District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2752"	2, 745. 6
International Boundary Monument 535; Daniels County, Mont., Wood Mountain District, Sask.; in the concrete base of the monument; iron post with bronze cap marked "U. S. & C. B. Survey B. M., 2762"	2, 755. 7
International Boundary Monument 536; Daniels County, Mont., Wood Mountain District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2557"	2, 551. 5
International Boundary Monument 537; Daniels County, Mont., Wood Mountain District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2482"	2, 475. 8
International Boundary Monument 538; Daniels County, Mont., Wood Mountain District, Sask.; in the south side of the concrete base of the monument; iron post with bronze cap marked "U. S. & C. B. Survey B. M., 2461"	2, 455. 2
International Boundary Monument 539; Daniels County, Mont., Wood Mountain District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2473"	2, 466. 7
International Boundary Monument 540; Daniels County, Mont., Wood Mountain District, Sask.; in the concrete base of the monument; iron post with bronze cap marked "U. S. & C. B. Survey B. M., 2590"	2, 583. 9
International Boundary Monument 541; Daniels County, Mont., Wood Mountain District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2496"	2, 492. 8
International Boundary Monument 542; Daniels County, Mont., Wood Mountain District, Sask.; in the concrete base of the monument; iron post with bronze cap marked "U. S. & C. B. Survey B. M., 2527"	2, 524. 3
International Boundary Monument 543; Daniels County, Mont., Wood Mountain District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2492"	2, 488. 7
International Boundary Monument 544; Daniels County, Mont., Wood Mountain District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2635"	2, 631. 9

International Boundary Monument 545; Daniels County, Mont., Wood Mountain District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2522"	Elevation (feet) 2, 519. 2
International Boundary Monument 546; Daniels County, Mont., Wood Mountain District, Sask.; in the concrete base of the monument; bronze disk marked "U.S. & C.B. Survey B. M., 2453"	2, 449. 6
International Boundary Monument 547; Daniels County, Mont., Wood Mountain District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2622"	2, 618. 9
International Boundary Monument 548; Daniels County, Mont., Wood Mountain District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2584"	2, 582. 3
International Boundary Monument 549; Daniels County, Mont., Wood Mountain District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2487"	2, 483. 5
International Boundary Monument 550; Sheridan County, Mont., Wood Mountain District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2378"	2, 373. 9
International Boundary Monument 551; Sheridan County, Mont., Wood Mountain District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2397"	2, 392. 8
International Boundary Monument 552; Sheridan County, Mont., Wood Mountain District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2495"	2, 490. 8
International Boundary Monument 553; Sheridan County, Mont., Wood Mountain District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2392"	2, 388. 1
International Boundary Monument 554; Sheridan County, Mont., Wood Mountain District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2478"	2, 473. 2
International Boundary Monument 555; Sheridan County, Mont., Wood Mountain District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2420"	2, 415. 4
International Boundary Monument 556; Sheridan County, Mont., Wood Mountain District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2422"	2, 417. 6
International Boundary Monument 557; Sheridan County, Mont., Weyburn District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2508"	2, 503. 9
International Boundary Monument 558; Sheridan County, Mont., Weyburn District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2547"	2, 542. 9
International Boundary Monument 559; Sheridan County, Mont., Weyburn District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2540"	2, 535. 3
International Boundary Monument 560; Sheridan County, Mont., Weyburn District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2504"	2, 499. 4
International Boundary Monument 561; Sheridan County, Mont., Weyburn District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2389"	2, 384. 4
International Boundary Monument 562; Sheridan County, Mont., Weyburn District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2431"	2, 426. 2
International Boundary Monument 563; Sheridan County, Mont., Weyburn District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2443"	2, 428. 6
International Boundary Monument 564; Sheridan County, Mont., Weyburn District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2422"	2, 416. 1
International Boundary Monument 565; Sheridan County, Mont., Weyburn District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2401"	2, 395. 7
International Boundary Monument 566; Sheridan County, Mont., Weyburn District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2340"	2, 334. 0

	Elevation
International Boundary Monument 567; Sheridan County, Mont., Weyburn District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2317"	(feet) 2, 311. 5
International Boundary Monument 568; Sheridan County, Mont., Weyburn District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2390"	2, 383. 9
International Boundary Monument 569; Sheridan County, Mont., Weyburn District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2308"	2, 302. 4
International Boundary Monument 570; Sheridan County, Mont., Weyburn District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2350"	2, 344. 6
International Boundary Monument 571; Sheridan County, Mont., Weyburn District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2285"	2, 278. 9
International Boundary Monument 572; Sheridan County, Mont., Weyburn District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2249"	2, 243. 1
International Boundary Monument 573; Sheridan County, Mont., Weyburn District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2256"	2, 250. 6
International Boundary Monument 574; Sheridan County, Mont., Weyburn District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2206"	2, 200. 7
International Boundary Monument 575; Sheridan County, Mont., Weyburn District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2312"	2, 306. 3
International Boundary Monument 576; Sheridan County, Mont., Weyburn District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2326"	2, 320. 4
International Boundary Monument 577; Sheridan County, Mont., Weyburn District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2372"	2, 366. 3
International Boundary Monument 578; Sheridan County, Mont., Weyburn District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2239"	2, 233. 0
International Boundary Monument 579; Sheridan County, Mont., Weyburn District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2357"	2, 351. 5
International Boundary Monument 580; Sheridan County, Mont., Weyburn District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2263"	2, 257. 4
International Boundary Monument 581; Sheridan County, Mont., Weyburn District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2234"	2, 228. 5
International Boundary Monument 582; Sheridan County, Mont., Weyburn District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M."	2, 244. 1
International Boundary Monument 583; Sheridan County, Mont., Divide County, N. Dak., Weyburn District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2181"	2, 175. 3
THE NORTH DAKOTA-SASKATCHEWAN LINE	
International Boundary Monument 584; Divide County, N. Dak., Weyburn District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2221"	2, 214. 7
International Boundary Monument 585; Divide County, N. Dak., Weyburn District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2140"	2, 134. 6
International Boundary Monument 586; Divide County, N. Dak., Weyburn District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M."	2, 196. 5
International Boundary Monument 587; Divide County, N. Dak., Weyburn District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2207"	2, 201. 4

International Boundary Monument 588; Divide County, N. Dak., Weyburn District, Sask.; in to concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2245"	
International Boundary Monument 589; Divide County, N. Dak., Weyburn District, Sask.; in to concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2326"	
International Boundary Monument 590; Divide County, N. Dak., Weyburn District, Sask.; in concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2292"	
International Boundary Monument 591; Divide County, N. Dak., Weyburn District, Sask.; in concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2359"	
International Boundary Monument 592; Divide County, N. Dak., Weyburn District, Sask.; in concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2337"	
International Boundary Monument 593; Divide County, N. Dak., Weyburn District, Sask.; in concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2298"	
International Boundary Monument 594; Divide County, N. Dak., Weyburn District, Sask.; in to concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2241"	
International Boundary Monument 595; Divide County, N. Dak., Weyburn District, Sask.; in concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2202"	
International Boundary Monument 596; Divide County, N. Dak., Weyburn District, Sask.; in concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2042"	
International Boundary Monument 597; Divide County, N. Dak., Weyburn District, Sask.; in concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2092"	
International Boundary Monument 598; Divide County, N. Dak., Weyburn District, Sask.; in concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2062"	
International Boundary Monument 599; Divide County, N. Dak., Weyburn District, Sask.; in concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2045"	
International Boundary Monument 600; Divide County, N. Dak., Weyburn District, Sask.; in concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2035"	
International Boundary Monument 601; Divide County, N. Dak., Weyburn District, Sask.; in concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 2029"	
International Boundary Monument 601, about 0.7 mile south and a little east of; $2\frac{1}{2}$ miles no of Ambrose, Divide County, N. Dak.; on a little knoll on the north side of a coulee; just east the middle of the west line of sec. 36, T. 164 N., R. 99 W.; iron post with bronze cap, mark "U. S. & C. B. Survey", marking triangulation station "School"	of
Ambrose, Divide County, N. Dak.; on the north side of the "Soo" railway, 1,800 feet west of railway station, 35 feet north of the south rail of the track, and on the first small rise of groue east of a watering pond; bronze disk marked "U. S. & C. B. Survey", set in a block of concretable by 12 inches, marking triangulation station "Ambrose west base"	ete
International Boundary Monument 602; Divide County, N. Dak., Weyburn District, Sask.; in concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 1988"	
International Boundary Monument 603; Divide County, N. Dak., Weyburn District, Sask.; in concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 1964"	
International Boundary Monument 604; Divide County, N. Dak., Weyburn District, Sask.; in concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 1933"	
International Boundary Monument 605; Divide County, N. Dak., Weyburn District, Sask.; in concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 1907"	
International Boundary Monument 606; Divide County, N. Dak., Weyburn District, Sask.; in concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 1929"	

International Boundary Monument 607; Divide County, N. Dak., Weyburn District, Sask.; in the	Elevation (feet)
concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 1922"	1, 912. 5
International Boundary Monument 608; Divide County, N. Dak., Weyburn District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 1925"	1, 915. 7
International Boundary Monument 609; Divide County, N. Dak., Weyburn District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 1919"	1, 909. 7
International Boundary Monument 610; Divide County, N. Dak., Assiniboia District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 1918"	1, 908. 3
International Boundary Monument 611; Divide County, N. Dak., Assiniboia District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 1912"	1, 903. 2
International Boundary Monument 612; Divide County, N. Dak., Assiniboia District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 1910"	1, 900. 6
International Boundary Monument 613; Divide County, N. Dak., Assiniboia District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 1906"	1, 896. 4
International Boundary Monument 614; Divide County, N. Dak., Assiniboia District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 1908"	1, 898. 4
International Boundary Monument 615; Divide County, N. Dak., Assiniboia District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 1908"	1, 899. 0
International Boundary Monument 616; Divide County, N. Dak., Assiniboia District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 1909"	1, 899. 9
International Boundary Monument 617; Divide County, N. Dak., Assiniboia District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 1904"	1, 894. 3
International Boundary Monument 618; Burke County, N. Dak., Assiniboia District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 1920"	1, 910. 6
International Boundary Monument 619; Burke County, N. Dak., Assiniboia District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 1919"	1, 910. 0
International Boundary Monument 620; Burke County, N. Dak., Assiniboia District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M., 1900"	1, 891. 0
International Boundary Monument 621; Burke County, N. Dak., Assiniboia District, Sask.; the center of the horizontal letter "I" in the word "UNITED" cast on the south face of the monument shaft	1, 902. 8
International Boundary Monument 622; Burke County, N. Dak., Assiniboia District, Sask.; the center of the horizontal letter "I" in the word "UNITED" cast on the south face of the monument shaft	1, 897. 7
International Boundary Monument 623; Burke County, N. Dak., Assiniboia District, Sask.; the center of the horizontal letter "I" in the word "UNITED" cast on the south face of the monument shaft.	1, 906. 2
International Boundary Monument 624; Burke County, N. Dak., Assiniboia District, Sask.; the center of the horizontal letter "I" in the word "UNITED" cast on the south face of the monument shaft.	1, 921. 9
International Boundary Monument 625; Burke County, N. Dak., Assiniboia District, Sask.; the center of the horizontal letter "I" in the word "UNITED" cast on the south face of the monument shaft.	1, 962. 1
International Boundary Monument 626; Burke County, N. Dak., Assiniboia District, Sask.; the center of the horizontal letter "I" in the word "UNITED" cast on the south face of the monu-	
ment shaft	1, 963. 9

International Boundary Monument 627; Burke County, N. Dak., Assiniboia District, Sask.; the center of the horizontal letter "I" in the word "UNITED" cast on the south face of the monument shaft	Elevation (feet) 1, 979. 6
International Boundary Monument 628; Burke County, N. Dak., Assiniboia District, Sask.; the center of the horizontal letter "I" in the word "UNITED" cast on the south face of the monument shaft	1, 973. 1
International Boundary Monument 629; Burke County, N. Dak., Assiniboia District, Sask.; the center of the horizontal letter "I" in the word "UNITED" cast on the south face of the monument shaft	1, 973. 0
International Boundary Monument 630; Portal, Burke County, N. Dak., North Portal, Assiniboia District, Sask.; in the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey B. M."	4 1, 953. 056
The North Dakota-Manitoba Line	
International Boundary Monument 693; Bottineau County, N. Dak., Souris District, Man.; Geodetic Survey of Canada first-order bench mark, a copper bolt marked "G. S. C. B. M. 39-C" set horizontally in the north face of the concrete base of the monument	1, 729. 807
International Boundary Monument 694; Bottineau County, N. Dak., Souris District, Man.; the southeast corner of the concrete base of the monument	1, 748. 3
International Boundary Monument 695; Bottineau County, N. Dak., Souris District, Man.; the northwest corner of the concrete base of the monument	1, 825. 8
International Boundary Monument 696; Bottineau County, N. Dak., Souris District, Man.; the northeast corner of the concrete base of the monument	2, 144. 2
International Boundary Monument 697, 7 feet northwest of; Bottineau County, N. Dak., Souris District, Man.; bronze disk marked "U. S. & C. B. Survey" set in a rock and marking triangulation station "Bottineau"	2, 243. 3
International Boundary Monument 698; Bottineau County, N. Dak., Souris District, Man.; the northwest corner of the concrete base of the monument	2, 282. 3
International Boundary Monument 699; Bottineau County, N. Dak., Souris District, Man.; the west edge of the concrete base of the monument	2, 541. 0
International Boundary Monument 700; Bottineau County, N. Dak., Souris District, Man.; the southeast corner of the concrete base of the monument	2, 333. 2
International Boundary Monument 701; Bottineau County, N. Dak., Souris District, Man.; the northwest corner of the concrete base of the monument	2, 153. 2
International Boundary Monument 702; Bottineau County, N. Dak., Souris District, Man.; the southeast corner of the concrete base of the monument	2, 148. 5
International Boundary Monument 703; Bottineau County, N. Dak., Souris District, Man.; the southwest corner of the concrete base of the monument.	2, 178. 6
International Boundary Monument 704; Bottineau County, N. Dak., Souris District, Man.; the northeast corner of the concrete base of the monument	2, 194. 3
International Boundary Monument 705; Bottineau County, N. Dak., Souris District, Man.; the northwest corner of the concrete base of the monument	2, 262. 2
International Boundary Monument 706; Bottineau County, N. Dak., Souris District, Man.; the southeast corner of the concrete base of the monument	2, 253. 2
International Boundary Monument 707; Bottineau County, N. Dak., Souris District, Man.; the southeast corner of the concrete base of the monument	2, 247. 9
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¹⁴ This is also a first-order bench mark of the Geodetic Survey of Canada and of the United States Coast and Geodetic Survey.

International Boundary Monument 708; Rolette County, N. Dak., Souris District, Man.; the ground at the northeast corner of the concrete base of the monument	Elevation (feet) 2, 269. 1
International Boundary Monument 709; Rolette County, N. Dak., Souris District, Man.; the northeast corner of the concrete base of the monument	2, 228. 0
International Boundary Monument 710; Rolette County, N. Dak., Souris District, Man.; the ground at the northwest corner of the concrete base of the monument.	2, 207. 8
International Boundary Monument 711; Rolette County, N. Dak., Souris District, Man.; the northeast corner of the concrete base of the monument	2, 293. 4
International Boundary Monument 712; Rolette County, N. Dak., Souris District, Man.; the ground at the northeast corner of the concrete base of the monument	2, 357. 0
International Boundary Monument 713; Rolette County, N. Dak., Souris District, Man.; the ground at the northeast corner of the concrete base of the monument	2, 271. 7
nternational Boundary Monument 714; Rolette County, N. Dak., Souris District, Man.; the ground at the northeast corner of the concrete base of the monument	2, 240. 9
nternational Boundary Monument 715; Rolette County, N. Dak., Souris District, Man.; the ground at the northeast corner of the concrete base of the monument	2, 182. 5
nternational Boundary Monument 716; Rolette County, N. Dak., Souris District, Man.; the ground at the northeast corner of the concrete base of the monument	2, 124. 2
nternational Boundary Monument 717; Rolette County, N. Dak., Souris District, Man.; the ground at the northeast corner of the concrete base of the monument	2, 120, 4
nternational Boundary Monument 718; Rolette County, N. Dak., Souris District, Man.; the ground at the northeast corner of the concrete base of the monument	2, 065. 4
nternational Boundary Monument 719; Rolette County, N. Dak., Souris District, Man.; the ground at the northeast corner of the concrete base of the monument	2, 061. 2
nternational Boundary Monument 720; Rolette County, N. Dak., Souris District, Man.; the ground at the northeast corner of the concrete base of the monument	1, 935. 4
nternational Boundary Monument 721; Rolette County, N. Dak., Souris District, Man.; in the east side of the top of the concrete base of the monument; Geodetic Survey of Canada first-order bench mark, a copper bolt marked "G. S. C., B. M. 360-C"	1, 901. 46
nternational Boundary Monument 721, ½ mile east of; Souris District, Man.; 10 feet north of the International Boundary Line and 10 feet east of the west limit of the Great Northern Railway right-of-way; Geodetic Survey of Canada first-order bench mark, a copper bolt set in the top of a concrete bench-mark pier and marked "G. S. C., B. M. 359–C"	1, 886. 08
nternational Boundary Monument 742, 0.4 mile west of; Lisgar District, Man.; 10 feet north of the International Boundary Line and on the east boundary of sec. 6, T. 1, R. 13 W.; Geodetic Survey of Canada first-order bench mark, a copper bolt set horizontally in the north face of a concrete bench-mark pier and marked "G. S. C., B. M. 18-C"	1, 548. 58
nternational Boundary Monument 816, ¼ mile east of; Gretna, Lisgar District, Man.; 190 feet north of the International Boundary Line and 47 feet west of the Great Northern Railway's abandoned track to West Gretna station; Geodetic Survey of Canada first-order bench mark, a copper bolt set in the top of a concrete bench-mark pier and marked "G. S. C., B. M. 431–D"	829. 5
Fretna, Lisgar District, Man.; in the north stone foundation wall of the public school, 6½ feet from the northwest corner and 5¾ feet below the brickwork; Geodetic Survey of Canada first-order bench mark, a copper bolt set horizontally and marked "G. S. C., B. M. 432-D"	833. 18
Gretna, Lisgar District, Man., 1% miles north of; 2 miles north of the International Boundary Line, 100 feet south of the road allowance along the north boundary of sec. 7, T. 1, R. 1 W., and 3 feet east of the west limit of the abandoned right-of-way of the Great Northern Railway; Geodetic Survey of Canada first-order bench mark, a copper bolt set in the top of a concrete bench-mark	
pier and marked "G. S. C., B. M. 430–D"	830, 0

THE MINNESOTA-MANITOBA LINE

Emerson, Provencher District, Man.; in the east stone foundation wall of the post office, 3 feet from the southeast corner, and 2 feet below the brickwork; Geodetic Survey of Canada first-order bench mark, a copper bolt marked "G. S. C., B. M. 3–C" set horizontally in the wall.	786. 526
Emerson, Provencher District, Man.; in the south stone foundation wall of the post office, 1 foot from the southwest corner and 2 feet 4 inches below the brickwork; Public Works Department of Canada bench mark, a copper bolt marked "MCCCCLXXIV" set horizontally in the wall; it is also a first-order bench mark of the Geodetic Survey of Canada	786. 050
International Boundary Monument 833; Kittson County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 785"	785. 5
International Boundary Monument 834; Kittson County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 776".	776. 0
International Boundary Monument 835; Kittson County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 793".	793. 6
International Boundary Monument 836; Kittson County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 776".	776. 2
International Boundary Monument 837; Kittson County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 794".	794. 3
International Boundary Monument 838; Kittson County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 794".	794. 7
International Boundary Monument 839; Kittson County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 794".	793. 7
International Boundary Monument 840; Kittson County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 794"	793. 9
International Boundary Monument 841; Kittson County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 795".	795. 1
International Boundary Monument 842; Kittson County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 799".	798. 9
International Boundary Monument 843; Kittson County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 813".	812. 8
International Boundary Monument 844; Kittson County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 854".	854. 0
International Boundary Monument 845; Kittson County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 871".	870. 7
International Boundary Monument 846; Kittson County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 884".	883. 9
International Boundary Monument 847; Kittson County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 899".	898. 4
International Boundary Monument 848; Kittson County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 912".	911. 6
International Boundary Monument 849; Kittson County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 916".	916. 4
International Boundary Monument 850; Kittson County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 929".	928. 9

Elevation (feet) 952. 1	International Boundary Monument 851; Kittson County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 952"
962. 8	International Boundary Monument 852; Kittson County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 963"
971. 1	International Boundary Monument 853; Kittson County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 971"
973. 9	International Boundary Monument 854; Kittson County, Minn., Provencher District, Man.; the top of the concrete base of the monument
980. 4	International Boundary Monument 855; Kittson County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 980"
982. 6	International Boundary Monument 856; Kittson County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 983"
986. 2	International Boundary Monument 857; Kittson County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 986"
991. 8	International Boundary Monument 858; Kittson County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 992"
997. 5	International Boundary Monument 859; Kittson County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 998"
1, 000. 9	International Boundary Monument 860; Kittson County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1001"
1, 000. 8	International Boundary Monument 861; Kittson County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1001"
1, 007. 5	International Boundary Monument 862; Kittson County, Minn., Provencher District, Man.; the top of the concrete base of the monument
1, 003. 2	International Boundary Monument 863; Kittson County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1004"
1, 002. 0	International Boundary Monument 864; Kittson County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1002"
1, 003. 1	International Boundary Monument 865; Kittson County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1003"
1, 010. 0	International Boundary Monument 866; Kittson County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1011"
1, 021. 0	International Boundary Monument 867; Kittson County, Minn, Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1021"
1, 014. 4	International Boundary Monument 867, 2½ miles south and ¼ mile west of; Kittson County, Minn.; at the northeast corner of sec. 9, T. 163 N., R. 45 W.; 39 feet south and 29 feet west of the intersection of the center lines of a north-and-south road and a road running west; United States Geological Survey bronze disk marked "1929 H 16" set in the top of a concrete post
1, 028. 8	International Boundary Monument 868; Kittson County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1029"
1, 033. 9	International Boundary Monument 869; Kittson County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1034"_
1, 040. 9	International Boundary Monument 870; Roseau County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1041"

International Boundary Monument 870, 1½ miles south and ½ mile west of; Kittson and Roseau Counties, Minn.; near the northwest corner of sec. 6, T. 163 N., R. 44 W.; on the east end of the concrete pier of the bridge over Roseau River; United States Geological Survey bronze disk	Elevation (feet)
	1, 020. 1
International Boundary Monument 871; Roseau County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1042"	1, 041. 7
International Boundary Monument 872; Roseau County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1037"	1, 037. 2
International Boundary Monument 872, ¾ mile south of; Roseau County, Minn.; in the NW¼ sec. 33, T. 164 N., R. 44 W.; 80 feet southwest of Noracres post office; near the west end of the middle concrete step at the north entrance to the residence of the postmaster; United States Geological Survey bronze disk marked "1929 H" set in the concrete.	1, 029. 3
International Boundary Monument 873; Roseau County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1035"	1, 032. 8
International Boundary Monument 873, 730 feet west and 40 feet north of; Provencher District, Man.; at the corner of sections 4 and 5; bronze disk set in concrete	1, 032. 0
International Boundary Monument 874; Roseau County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1032"	1, 032. 0
International Boundary Monument 875; Roseau County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1033"	1, 033. 7
International Boundary Monument 876; Roseau County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1032"	1, 031. 1
International Boundary Monument 876, ½ mile south of; Roseau County, Minn.; at the corner of Ts. 163 and 164 N., Rs. 43 and 44 W., 2 feet south of mound and old corner stake; bronze cap on iron post marked "T. T. Sta. No. 11 L. 1929"	1, 026. 3
International Boundary Monument 876, 2 miles north of; Provencher District, Man.; 25 feet west of the northeast corner of sec. 11, T. 1, R. 9 E.; standard rock post of the Topographical Survey of Canada set in the north end of an embedded boulder 3 feet by 6 feet by 1½ feet high	1, 060. 1
International Boundary Monument 877; Roseau County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1032"	1, 031. 3
International Boundary Monument 878; Roseau County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1031"	1, 030. 3
International Boundary Monument 879; Roseau County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1034"	1, 033. 2
International Boundary Monument 880; Roseau County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Śurvey, 1035"	1, 034. 0
International Boundary Monument 880, 1¾ miles north of; Provencher District, Man.; on the west boundary of sec. 10, T. 1, R. 10 E., 1,040 feet north of the ¼ sec. corner; a standard rock post of the Topographical Survey of Canada set in an embedded boulder 3 feet by 3 feet by 1¼ feet high ¹⁶	1, 052. 8
International Boundary Monument 881; Roseau County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1037"	1, 037. 4
Invernational Boundary Monument 882; Roseau County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1039".	1, 039. 0
15 Established by United States Geological Survey.	

Established by United States Geological Survey.
 Established by the Topographical Survey of Canada, 1929.

International Boundary Monument 883; Roseau County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1041"	
International Boundary Monument 884; Roseau County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1042"	
International Boundary Monument 885; Roseau County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1044"	
Duxby, Roseau County, Minn.; about 6 miles south of the International Boundary Line, in the SW2 sec. 26, T. 163 N., R. 42 W.; on the southwest part of the acre lot of N. M. Cedarholm, about 300 feet south of Roseau River, 250 feet east of Duxby post office, in the south track of the travelect road; a triangulation station bronze disk marked "U. S. & C. B. Survey" set in a concrete block to mark triangulation station "Duxby"	
International Boundary Monument 886; Roseau County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1046"	1, 045. 4
International Boundary Monument 886, 2 miles north and ¼ mile east of; Provencher District, Man. 1,060 feet east and 6 feet north of the northwest corner of sec. 10, T. 1, R. 11 E.; a standard rock post of the Topographical Survey of Canada set in the highest point of an embedded boulder 3½ feet by 3½ feet by 2 feet high.	
International Boundary Monument 887; Roseau County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1066"	
International Boundary Monument 888; Roseau County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1074"	
International Boundary Monument 888, 1½ miles south of; Roseau County, Minn.; 93 feet east and 20 feet north of the approximate corner of Ts. 163 and 164 N. and Rs. 41 and 42 W.; 74 feet east and 1 foot south of a fence corner; a bronze disk marked "T. T. Sta. No. 3 L. 1929" set in a concrete post; established by the United States Geological Survey	
International Boundary Monument 889; Roseau County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1070"	
International Boundary Monument 889, 2 miles north of; Provencher District, Man.; near the northeast corner of sec. 12, T. 1, R. 11 E.; in the east concrete foundation wall of the public school building, 2 feet south of the northeast corner; a standard rock post of the Topographical Survey of Canada set in the concrete	
International Boundary Monument 890; Roseau County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1068"	1, 066. 7
International Boundary Monument 891; Roseau County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1052"	
International Boundary Monument 892; Roseau County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1055"	1, 054. 0
International Boundary Monument 893; Roseau County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1080"	1, 079. 3
International Boundary Monument 894; Roseau County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1087"	1, 086. 0
International Boundary Monument 895; Roseau County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1070"	1, 069. 5
International Boundary Monument 896; Roseau County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1078"	1, 076. 8

¹⁶ Established by the Topographical Survey of Canada, 1929.
¹⁷ Elevation by the United States Geological Survey.

International Boundary Monument 897; Roseau County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1057"	Elevation (feet) 1, 056. 7
International Boundary Monument 897, 2½ miles south of; Roseau County, Minn.; about 1,000 feet east of the quarter corner between secs. 5 and 8, T. 163 N., R. 39 W.; 396 feet southwest of a bridge over Mud Creek and on the west side of Sprague road; 30 feet north of an old fence; in the top of a concrete post; United States Geological Survey bronze disk marked "T. T. Sta. No. 9 L. 1929"	1, 044. 3
International Boundary Monument 898; Roseau County, Minn.; Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1059"	1, 057. 7
International Boundary Monument 898, ½ mile south of; Roseau County, Minn.; about 900 feet west of the northeast corner of sec. 34, T. 164 N., R. 39 W.; at a United States water gage, on the west bank of Mud Creek, on the south side of the road, at the bridge; bronze disk in the top of a concrete post; established by the United States Geological Survey	1, 051. 2
International Boundary Monument 899; Roseau County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1057"	1, 055. 9
International Boundary Monument 900; Roseau County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1065"	1, 064. 4
International Boundary Monument 901; Roseau County, Minn., Provencher District, Man.; the top of the concrete base of the monument	1, 066. 7
International Boundary Monument 902; Roseau County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1075"	1, 073. 9
International Boundary Monument 903; Roseau County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1097"	1, 096. 3
International Boundary Monument 904; Roseau County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1079"	1, 077. 7
International Boundary Monument 905; Roseau County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1078"	1, 077. 4
International Boundary Monument 906; Roseau County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1078"	1, 076. 9
Salol, Roseau County, Minn.; on the south side of the Great Northern Railway; 1,100 feet west of the railway station, 80 feet south of the railroad track, 13 feet south of a telephone line between the railway and the highway; 100 feet east of a north-and-south road; in line with a church steeple and the kitchen window of Gustafson's house, both of which are south of the station; a triangulation station bronze disk marked "U. S. & C. B. Survey" set in a concrete block to mark triangulation station "Salol"	¹⁷ 1, 074. 7
International Boundary Monument 907; Roseau County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1072"	1, 071. 9
International Boundary Monument 908; Roseau County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1075"	1, 074. 6
International Boundary Monument 909; Roseau County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1072"	¹⁸ 1, 072
International Boundary Monument 910; Roseau County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1067"	1, 066. 9
International Boundary Monument 911; Roseau County, Minn., Provencher District, Man.; in the top of the concrete base of the monument; bronze disk marked "U. S. & C. B. Survey, 1060"	1, 059. 8
To File at the Land Control Common	

<sup>Elevation by the United States Geological Survey.
This bench mark is known to have been disturbed, and the elevation is now only approximate.</sup>

in the north face of the northeast concrete footing, 7 inches below the top; Geodetic Survey of Canada first-order bench mark, a copper bolt marked "G. S. C. B. M. 9–E" set horizontally in	evation (feet) 070. 270
Middlebro, Provencher District, Man.; on the Canadian National Railway, 520 feet east of the section house and at mileage 48.4 from Rainy River; 177 feet east of Geodetic Survey of Canada precise traverse station "Middleboro", and 37 feet south of the railway track; Geodetic Survey of Canada first-order bench mark, a copper bolt marked "G. S. C. B. M. 11-E" set horizontally in the north face of a concrete pier.	090. 652
International Boundary Monument 924; Roseau County, Minn., Provencher District, Man.; on the north side of Harrison Creek and the old Dawson Road, about 600 meters southwest of Northwest Angle Inlet; International Joint Commission bench mark, bronze plug set in the concrete base of the monument	065. 67
Warroad, Roseau County, Minn.; 12 meters southwest of the intersection of Lake and State Streets, on the public-school grounds, 50 meters east of the schoolhouse; iron post with bronze cap marked "U. S. Geological Survey B. M. 1069"	067. 26
Warroad, Roseau County, Minn.; on the public-school ground, near the fence, in front of and to the west of the new schoolhouse; International Joint Commission bench mark, copper plug in concrete block whose base extends 6 feet below the surface of the ground	068. 19
Warroad, Roseau County, Minn.; 335 meters east of the Lake Street crossing of the Canadian National Railway, 44 meters east of Mr. Moody's house, 12 meters north of the edge of Warroad River, and 17 meters southeast of an outbuilding on Mr. Moody's grounds; U. S. Engineer Corps bench mark No. 303, top of cap on iron post	065. 35
Warroad, Roseau County, Minn.; in the west foundation wall of the post office, a concrete-block building on the north side of Lake Street about 120 meters east of the Canadian National Railway, 1. 9 meters from the southwest corner of the building and 0.12 meter below the concrete blocks; Geodetic Survey of Canada bench mark No. 12–E, copper bolt marked "G. S. C., B. M.	
그리고 그는 그는 그는 그는 그는 그는 그들이 그렇게 되었다면 하는데 보다는데 그는 그는데 그는데 그는데 그는데 그는데 그는데 그는데 그는데 그는	069. 296

USEFUL ELEVATIONS

The following list of elevations of the ground at international boundary monuments along sections of the boundary where few or no permanent bench marks were established is given as information useful for reconnaissance purposes. These elevations were determined by level lines run along the boundary for vertical control of the topographic mapping only. The limits of error permitted in the work and the extreme length of the lines between control bench marks do not warrant an adjustment of these levels. The elevations are given to the nearest foot as originally determined. The precise elevation of the initial point and of the terminal point of each line are given to indicate the closure error.

THE MONTANA-ALBERTA LINE	
THE MONTANA-ALBERTA LINE	Elevation (feet)
International Boundary Monument 334, bench mark in base of	²⁰ 3, 466. 666
International Boundary Monument 339, ground at	3, 377
International Boundary Monument 341, ground at	3, 322
International Boundary Monument 343, ground at	3, 534

¹⁹ Elevation determined by Geodetic Survey of Canada.

²⁰ See p. 226 for description of bench mark.

	Elevation (feet)
International Boundary Monument 345, ground at	3, 759
International Boundary Monument 347, ground at	4, 237
International Boundary Monument 348, ground at	4, 198
International Boundary Monument 351, ground at	3, 671
International Boundary Monument 354, ground at	3, 662
International Boundary Monument 356, ground at	3, 550
International Boundary Monument 358, ground at	3, 701
International Boundary Monument 360, ground at	3, 809
International Boundary Monument 362, ground at	3, 648
International Boundary Monument 364, ground at	3, 522
International Boundary Monument 366, ground at	3, 593
International Boundary Monument 368, ground at	3, 447
International Boundary Monument 370, ground at	3, 419
International Boundary Monument 372, ground at	3, 263
International Boundary Monument 374, ground at	3, 193
International Boundary Monument 383, ground at	2, 984
International Boundary Monument 385, ground at	2, 882
International Boundary Monument 387, ground at	2, 918
International Boundary Monument 389, ground at	2, 802
International Boundary Monument 391, ground at	2, 791
International Boundary Monument 393, ground at	2, 794
The Montana-Saskatchewan Line	
International Boundary Monument 395, ground at	2, 806
International Boundary Monument 397, ground at	2, 807
International Boundary Monument 399, ground at	2, 829
International Boundary Monument 401, ground at	2, 816
International Boundary Monument 403, 6 feet north of; bench mark	21 2, 753. 0 2, 752. 8
	2, 779
International Boundary Monument 404, ground at	
International Boundary Monument 406, ground at	
International Boundary Monument 407, ground at	2, 814
International Boundary Monument 409, ground at	2, 877
International Boundary Monument 411, ground at	2, 883
International Boundary Monument 412, ground at	2, 860
International Boundary Monument 413, ground at	2, 755
도 <u>U.U.U.S</u>	

See p. 227 for description of bench mark.
 See p. 227 for bench mark nearby.

			evatio feet)
International Boundary Monument 414, ground at	-	2, 8	833
International Boundary Monument 415, ground at	-	2, 8	882
International Boundary Monument 416, ground at		2, 8	898
International Boundary Monument 417, ground at	23 5	2, 8	393
International Boundary Monument 418, ground at	2	2, 9	909
International Boundary Monument 419, ground at	2	2, 8	818
International Boundary Monument 420, ground at	24 2	2, 8	360
International Boundary Monument 421, ground at	2	2, 8	351
International Boundary Monument 422, ground at	2	2, 8	828
International Boundary Monument 423, ground at	2	2, 7	796
International Boundary Monument 424, ground at	2	2, 8	317
International Boundary Monument 425, ground at	24 2	2, 8	384
International Boundary Monument 426, ground at	2	2, 9	920
International Boundary Monument 427, ground at		3, 0)47
International Boundary Monument 428, ground at	3	3, 3	864
International Boundary Monument 429, ground at	24 8	3, 3	378
International Boundary Monument 430, ground at	5	3, 3	328
International Boundary Monument 431, ground at	5	3, 2	236
International Boundary Monument 432, ground at	9	3, 1	93
International Boundary Monument 433, ground at	65	3, 0	55
International Boundary Monument 434, ground at	3	3, 1	80
International Boundary Monument 435, ground at	3	3, 1	63
International Boundary Monument 436, ground at.	24 3	3, 0	07
International Boundary Monument 437, ground at	3	, 0	62
International Boundary Monument 438, ground at	3	, 1	07
International Boundary Monument 439, ground at	3	, 1	34
International Boundary Monument 441, ground at	3	, 0	34
International Boundary Monument 442, ground at	3	, 0	41
International Boundary Monument 443, ground at	3	, 0	32
International Boundary Monument 444, ground at	3	, 0	21
International Boundary Monument 445, ground at	2	, 9	96
International Boundary Monument 446, ground at		, 0	
International Boundary Monument 447, ground at		, 9	
	1		TANKS I

<sup>See p. 227 for bench mark nearby.
See p. 228 for bench mark nearby.</sup>

International Boundary Monument 448, ground at	Elevation (feet) 2, 938
International Boundary Monument 449, ground at	2, 959
International Boundary Monument 450, ground at	2, 941
International Boundary Monument 451, ground at	2, 903
International Boundary Monument 452, ground at	2, 900
International Boundary Monument 453, ground at	2, 883
	2, 848
International Boundary Monument 454, ground at	
International Boundary Monument 455, ground at	2, 801
International Boundary Monument 456, ground at	2, 739
International Boundary Monument 457, ground at	2, 708
International Boundary Monument 458, ground at	2, 692
International Boundary Monument 459, ground at	2, 615
International Boundary Monument 460, ground at	2, 669
International Boundary Monument 461, ground at	2, 699
International Boundary Monument 462, ground at	2, 648
International Boundary Monument 463, ground at	2, 801
International Boundary Monument 464, ground at	2, 879
International Boundary Monument 465, ground at	2, 884
International Boundary Monument 466, ground at	2, 865
International Boundary Monument 467, ground at	2, 774
International Boundary Monument 468, ground at	2, 730
International Boundary Monument 469, ground at	2, 646
International Boundary Monument 471, ground at	2, 598
International Boundary Monument 472, ground at	2, 688
International Boundary Monument 473, ground at	2, 767
International Boundary Monument 476, ground at	2, 654
International Boundary Monument 478, bench mark in base of	
THE NORTH DAKOTA-SASKATCHEWAN LINE	
International Boundary Monument 630, bench mark in base of	²⁶ 1, 953, 056
International Boundary Monument 631, ground at	1, 947
International Boundary Monument 632, ground at	1, 933
International Boundary Monument 633, ground at	1, 940
International Boundary Monument 634, ground at	1, 914

See p. 229 for description of bench mark.
 See p. 237 for description of bench mark.

	Elevation (feet)
International Boundary Monument 635, ground at	1, 894
International Boundary Monument 636, ground at	1, 879
International Boundary Monument 637, ground at	1, 895
International Boundary Monument 638, ground at	1, 858
International Boundary Monument 639, ground at	1, 834
International Boundary Monument 640, ground at	1, 823
International Boundary Monument 641, ground at	1, 827
International Boundary Monument 642, ground at	1, 851
International Boundary Monument 643, ground at	1, 849
International Boundary Monument 644, ground at	1, 854
International Boundary Monument 645, ground at	1, 845
International Boundary Monument 646, ground at	1, 859
International Boundary Monument 647, ground at.	1, 814
International Boundary Monument 648, ground at	1, 794
International Boundary Monument 650, ground at	1, 802
International Boundary Monument 651, ground at	1, 792
International Boundary Monument 652, ground at	1, 772
International Boundary Monument 653, ground at	1, 765
International Boundary Monument 654, ground at	1, 748
International Boundary Monument 655, ground at	1, 739
International Boundary Monument 656, ground at	1, 710
International Boundary Monument 657, ground at	1, 684
International Boundary Monument 658, ground at	1, 678
International Boundary Monument 659, ground at	1, 655
International Boundary Monument 660, ground at	1, 641
International Boundary Monument 661, ground at	1, 612
International Boundary Monument 662, ground at	1, 630
International Boundary Monument 663, ground at	1, 623
International Boundary Monument 664, ground at	1, 618
International Boundary Monument 665, ground at	1, 611
International Boundary Monument 666, ground at	1, 599
International Boundary Monument 667, ground at	1, 599
International Boundary Monument 668, ground at	1, 580
International Boundary Monument 669, ground at	1, 581
International Boundary Monument 670, ground at	1, 547

	Тне	North	DAKOTA-MANITOBA LINE	Elevation (feet)
International Boundary	Monument 671,	ground	at	1, 541
International Boundary	Monument 672,	ground	at	1, 527
International Boundary	Monument 673,	ground	at	1, 522
International Boundary	Monument 674,	ground	at	1, 517
International Boundary	Monument 675,	ground	at	1, 512
International Boundary	Monument 676,	ground	at	1, 508
International Boundary	Monument 677,	ground	at	1, 497
International Boundary	Monument 678,	ground	at	1, 494
International Boundary	Monument 679,	ground	at	1, 492
International Boundary	Monument 680,	ground	at	1, 495
International Boundary	Monument 681,	ground	at	1, 488
International Boundary	Monument 682,	ground	at	1, 458
International Boundary	Monument 683,	ground	at	1, 484
International Boundary	Monument 684,	ground	at	1, 501
International Boundary	Monument 685,	ground	at	1, 510
International Boundary	Monument 686,	ground	at	1, 519
International Boundary	Monument 687,	ground	at	1, 526
International Boundary	Monument 688,	ground	at	1, 539
International Boundary	Monument 689,	ground	at	1, 528
International Boundary	Monument 690,	ground	at	1, 525
International Boundary	Monument 691,	ground	at	1, 546
International Boundary	Monument 692,	ground	at	1, 630
International Boundary	Monument 693,	ground	at	1, 731
International Boundary	Monument 693,	bench i	mark in base of27	1, 729. 807
International Boundary	Monument 721,	bench	mark in base of ²⁸	1, 901. 466
International Boundary	Monument 722,	ground	at	1, 872
International Boundary	Monument 723,	ground	at	1, 852
International Boundary	Monument 724,	ground	at	1, 827
International Boundary	Monument 725,	ground	at	1, 819
International Boundary	Monument 726,	ground	at	1, 799
International Boundary	Monument 727,	ground	at	1, 776
International Boundary	Monument 728,	ground	at	1, 752
International Boundary	Monument 729,	ground	at	1, 698

 $^{^{27}}$ See p. 237 for description of bench mark. 28 See p. 238 for description of bench mark.

	Elevation (feet)
International Boundary Monument 730, ground at	1, 653
International Boundary Monument 731, ground at	1, 628
International Boundary Monument 732, ground at	1, 589
International Boundary Monument 733, ground at	1, 555
International Boundary Monument 734, ground at	1, 539
International Boundary Monument 735, ground at	1, 536
International Boundary Monument 736, ground at	1, 543
International Boundary Monument 737, ground at	1, 530
International Boundary Monument 738, ground at	1, 538
International Boundary Monument 739, ground at	1, 533
International Boundary Monument 740, ground at	1, 539
International Boundary Monument 741, ground at	1, 554
International Boundary Monument 742, bench mark near; Geodetic Survey of Canada No. 18-C_ Elevation of No. 18-C by 1928 general adjustment2	1, 549. 863 8 1, 548. 581
International Boundary Monument 742, ground at	1, 570
International Boundary Monument 743, ground at	1, 569
International Boundary Monument 744, ground at	1, 587
International Boundary Monument 745, ground at	1, 611
International Boundary Monument 746, ground at	1, 597
International Boundary Monument 747, ground at	1, 585
International Boundary Monument 748, ground at	1, 572
International Boundary Monument 749, ground at	1, 561
International Boundary Monument 750, ground at	1, 552
International Boundary Monument 751, ground at	1, 553
International Boundary Monument 752, ground at	1, 545
International Boundary Monument 753, ground at	1, 545
International Boundary Monument 754, ground at	1, 542
International Boundary Monument 755, ground at	1, 533
International Boundary Monument 756, ground at	1, 542
International Boundary Monument 757, ground at	1, 556
International Boundary Monument 758, ground at	1, 579
International Boundary Monument 759, ground at	1, 561
International Boundary Monument 760, ground at	1, 560
International Boundary Monument 761, ground at	1, 564
28 See n. 238 for description of bench mark	

²⁸ See p. 238 for description of bench mark.

	Elevation (feet)
International Boundary Monument 762, ground at	1, 568
International Boundary Monument 763, ground at	1, 576
International Boundary Monument 764, ground at	1, 586
International Boundary Monument 765, ground at	1, 564
International Boundary Monument 766, ground at	1, 563
International Boundary Monument 767, ground at	1, 551
International Boundary Monument 768, ground at	1, 543
International Boundary Monument 769, ground at	1, 537
International Boundary Monument 770, ground at	1, 543
International Boundary Monument 771, ground at	1, 541
International Boundary Monument 772, ground at	1, 546
International Boundary Monument 773, ground at	1, 542
International Boundary Monument 774, ground at	1, 544
International Boundary Monument 775, ground at	1, 543
International Boundary Monument 776, ground at	1, 543
International Boundary Monument 777, ground at	1, 555
International Boundary Monument 778, ground at	1, 564
International Boundary Monument 779, ground at	1, 560
International Boundary Monument 780, ground at	1, 554
International Boundary Monument 781, ground at	1, 558
International Boundary Monument 782, ground at	1, 554
International Boundary Monument 783, ground at	1, 552
International Boundary Monument 784, ground at	1, 528
International Boundary Monument 796, ground at	1, 014
International Boundary Monument 797, ground at	979
International Boundary Monument 798, ground at	963
International Boundary Monument 799, ground at	948
International Boundary Monument 800, ground at	944
International Boundary Monument 801, ground at	938
International Boundary Monument 802, ground at	926
International Boundary Monument 803, ground at	912
International Boundary Monument 804, ground at	909
International Boundary Monument 805, ground at	900
International Boundary Monument 806, ground at	882

	Elevation (feet)
International Boundary Monument 807, ground at	881
International Boundary Monument 808, ground at	877
International Boundary Monument 809, ground at	874
International Boundary Monument 810, ground at	861
International Boundary Monument 811, ground at	850
International Boundary Monument 812, ground at	852
International Boundary Monument 813, ground at	844
International Boundary Monument 814, ground at	839
International Boundary Monument 815, ground at	836
International Boundary Monument 816, ground at	834
Geodetic Survey of Canada bench mark No. 4–C	832. 744
Geodetic Survey of Canada bench mark No. 4-C, on datum of 1928 adjustment	²⁹ 828. 810
International Boundary Monument 817, ground at	825
International Boundary Monument 818, ground at	822
International Boundary Monument 819, ground at	819
International Boundary Monument 820, ground at	813
International Boundary Monument 821, ground at	803
International Boundary Monument 822, ground at	798
International Boundary Monument 823, ground at	796
International Boundary Monument 824, ground at	799
International Boundary Monument 825, ground at	792
International Boundary Monument 826, ground at	792
International Boundary Monument 827, ground at	789
International Boundary Monument 828, ground at	790
International Boundary Monument 829, ground at	791
International Boundary Monument 830, ground at	792
International Boundary Monument 831, ground at	789
International Boundary Monument 832, ground at	790
Geodetic Survey of Canada bench mark No. 3-C	786. 169
Geodetic Survey of Canada bench mark No. 3-C, correct elevation	³⁰ 786. 526

<sup>This bench mark was reported lost in 1925.
See p. 239 for description of bench mark.</sup>

APPENDIX V

GEOGRAPHIC POSITIONS AND DESCRIPTIONS OF TRIANGULATION AND TRAVERSE STATIONS

This appendix contains: The tables of geographic positions of the triangulation and traverse stations used in determining the latitudes and longitudes of the boundary monuments and marks and in controlling the topographic surveys; the descriptions of all the marked triangulation and traverse stations other than boundary monuments; sketches of the triangulation and traverse schemes; and a station index to the tables, descriptions, and sketches.

EXPLANATION OF TABLES

All latitudes and longitudes are given in terms of the North American geodetic datum of 1927.¹ All azimuths are reckoned clockwise from the south. All distances are given in meters and are reduced to their mean-sea-level values.² Note should be made of the fact that the logarithms of distances have been derived from the computations and the distances have been derived from their corresponding logarithms. The azimuth and length of any line will be found opposite the second of the two stations of that line in the order in which they are listed. The following abbreviations have been used: "Mon." for Monument, "Ref." for Reference, and "ecc." for eccentric station.

In the tables of first-order triangulation stations the latitudes and longitudes are given to thousandths of seconds, the azimuths to hundredths of seconds, and the logarithms of distances to seven decimal places. The same is true for first-order traverse stations except that the azimuths are given to tenths of seconds only. In the tables of major triangulation stations the latitudes and longitudes are given to thousandths of seconds, the azimuths to tenths of seconds, and the logarithms of distances to six decimal places. In the tables of minor triangulation stations the latitudes and longitudes are given to hundredths of seconds, the azimuths to even seconds, and the logarithms of distances to six decimal places.

In selecting stations upon which new triangulation is to be based, points of the first-order or of the major schemes of triangulation should be chosen in preference to those of a lower order. In searching for a particular triangulation station on the ground, reference should be made to the boundary maps and triangulation sketches as well as to the printed description of the station.

The use of the station index and the triangulation sketches will materially facilitate obtaining any specific geodetic data desired.

¹ See p. 144.

² Formula for reduction, p. 143.

GEOGRAPHIC POSITIONS OF TRIANGULATION AND TRAVERSE STATIONS, FROM GEORGIA STRAIT TO LAKE OF THE WOODS, FIRST-ORDER SCHEME

Station		Latitude and longitude		Azimuth			x az	imuth	To station	Distance (meters)	Logarithm
	0		0	,	"	0	,	"			
Benson (Geodetic Survey of Canada)		8 59.357 2 56.629									
Gardner (Geodetic Survey of Canada)		2 36.960 3 20.549	62	31	00.26	242	00	59. 86	Benson	54, 276. 36	4. 734610
Little Mountain (Geodetic Survey of Canada).		4 33.062 6 44.216	81 126	$\frac{46}{42}$	07. 65 34. 04	261 306		34. 88 58. 57	BensonGardner	69, 051, 94 25, 070, 36	4.839175 4.399160
Delta west base (Geodetic Survey of Canada).		2 48, 396 4 25, 557	9 ₁ 9 148 172	30 05 39	30, 66 15, 95 31, 19	278 327 352	50	16. 86 56. 61 46. 32	Benson Gardner_ Little Mountain	72, 141. 48 43, 311. 85 21, 949. 44	4.858185 4.636606 4.341423
Delta east base (Geodetic Survey of Canada).		39, 212 55 20, 430	64 94 132 140	33 43 56 02	37. 60 30. 20 47. 76 40. 11	244 273 312 319	26 52 35 54	45. 75 23. 26 35. 23 02. 74	Delta west base Benson Gardner Little Mountain	12, 258. 55 82, 476. 60 46, 301. 01 21, 537. 36	4.088439 4.916330 4.665590 4.333192
Bruce (Geodetic Survey of Canada)		6 01.706 30 22.022	137 187 208 225 229	08 08 26 22 24	56. 54 43. 33 41. 37 58. 53 15. 76	316 7 28 45 49	44 14 44 42 50	22. 31 01. 77 31. 49 31. 55 40. 19	Benson Gardner Little Mountain Delta west base Delta east base	58, 242, 36 68, 353, 16 60, 209, 60 44, 403, 66 56, 150, 77	4.765239 4.834758 4.779665 4.647418 4.749355
Birch Point (Geodetic Survey of Canada).		56 30. 854 19 12. 021	69 104 122 139 147 156	09 53 13 35 33 11	10, 27 41, 78 31, 84 19, 94 01, 34 52, 93		09 19	10. 25 00. 12 02. 44 30. 15 46. 13 14. 81	Bruce Benson Delta west base Gardner Little Mountain Delta east base	53, 972. 02 92, 778. 98 21, 929. 36 63, 744. 66 39, 666. 00 18, 519. 96	4.792168 4.967449 4.341025 4.804443 4.598418 4.267640
Douglas (Geodetic Survey of Canada)	48 123	29 35, 705 20 43, 598	158 217	48 34	38. 11 40. 21	338 37	41 58	24. 03 21. 68	Bruce Birch Point	32, 679. 00 63, 120. 39	4. 514268 4. 800169
Constitution (Geodetic Survey of Canada).		39, 873 49 47, 541	61 101 181	51 33 24	13. 45 09. 65 34. 20	241 281 1		01. 51 40. 08 00. 93	Douglas Bruce Birch Point	43, 218, 21 50, 741, 26 29, 385, 27	4. 635666 4. 705361 4. 468129
Discovery (U. S. C. & G. S.)		25 32, 291 13 32, 133	130 226	20 02			15 19	32. 83 48. 87	Douglas Constitution	11, 623. 73 40, 490. 29	4. 06534 4. 60735
Iceberg (U. S. C. & G. S.)		25 12.161 53 00.408	91 103 187		19.14	271 283 7	16 13 52	42. 52 34. 32 45. 13	Discovery	25, 331, 81 35, 128, 59 28, 927, 91	4. 403666 4. 545666 4. 461313
Parke (Geodetic Survey of Canada)		50 23. 745 17 41. 386	5 62 297		34. 33 14. 38 23. 69	185 242 117	30 22 59	17. 51 42. 03 22. 32	Douglas	38, 731, 57 17, 505, 40 38, 652, 64	4. 588063 4. 24317 4. 587179
Avenue (Geodetic Survey of Canada)		00 08. 939 05 18. 291	40 49 103	39	01.08	219 229 282	20	48, 08 08, 18 38, 80	Parke	23, 572, 21 40, 292, 59 72, 074, 21	4. 372400 4. 605223 4. 857779
Whatcom (U. S. C. & G. S.)		19.667 21 34.705	88 129		36. 37 59. 00		47 36		Constitution Birch Point	34, 648. 20 43, 993. 65	4. 539680 4. 643390
Sumas (U. S. C. & G. S.)		54 55, 332 13 14, 783	22 59 94	40		201 239 273	12	24. 88 34. 20 06. 81	Whatcom Constitution Birch Point	27, 183, 21 51, 971, 00 44, 009, 85	4. 434300 4. 71576 4. 643549
Sisters (U. S. C. & G. S.)		12 18.150 59 09.951	86 143	22 41	54. 18 58. 11	266 323	06 31	03.97 22.35	WhatcomSumas	27, 558. 39 29, 055. 20	4. 440253 4. 463223
Church (U. S. C. & G. S.)		55 42.410 52 53.686	52	59	31. 91 01. 37 46. 97	197 232 266	07 37 31	48. 73 26. 28 26. 49	Sisters_ Whatcom_ Sumas	26, 002. 87 44, 083. 35 24, 901. 48	4. 415021 4. 644274 4. 396225
Bacon (U. S. C. & G. S.)		39 46.324 31 09.316			38. 44 19. 94		$\frac{35}{49}$	36. 14 58. 57	SistersChurch	34, 694, 83 39, 760, 92	4. 540264 4. 599456
Glacier (U. S. C. & G. S.)		58 11.358 14 21.363		10 39	12, 72 23, 89	210 264	57 10	34. 13 20. 10	BaconChurch	39, 850. 25 47, 272. 78	4. 600431 4. 674611
Davis	48	46. 558 12 05. 662	72 87	30 35	53. 81 11. 35 05. 92	266	16 59 04	34. 68 48. 99 23. 74	Bacon Sisters Glacier	24, 536, 19 57, 795, 39 26, 857, 22	4. 389807 4. 761893 4. 429061
Jackita (U. S. C. & G. S.)		46 24.892 51 01.998	79 127	24 34	10. 26 21. 09	259 307		20. 16 47. 03	Davis Glacier	26, 272, 16 35, 908, 97	4. 419495 4. 555202
Frosty	49 (00 38, 987 50 10, 946	2 40	15 43	45, 04 24, 94 37, 09	220	26	06. 57 54. 66 22. 60	Jackita Davis Glacier	26, 404. 33 41, 181. 84 29, 837. 64	4. 421675 4. 614705 4. 474764
Robinson		36. 680 4 25. 544	104 148	25 42	27. 18 41. 93	284 328		58. 00 49. 85	JackitaFrosty	21, 007, 89 56, 993, 21	4. 322382 4. 568122
Sheep (U. S. C. & G, S.)		58 36. 203 23 14. 331	56		16. 94 32. 51 11. 28	206 236 276	12	51. 51 36. 29 51. 32	Robinson	30, 973. 44 40, 805. 71 33, 081. 76	4. 490989 4. 610720 4. 519588
Remmel (U. S. C. & G. S.)	48 5 120 1	55 24.719 1 44.290	51 112		50. 55 07. 08	231 292	37 46	45. 92 26. 69	RobinsonSheep		4. 548334 4. 182844

POSITIONS OF TRIANGULATION AND TRAVERSE STATIONS

Station	Latitu longi	de and tude	A	zim	uth	Back	k azi	imuth	To station	Distance (meters)	Logarithm
Tiffany (U. S. C. & G. S.)		10, 927 52, 734	100	53 43 34	42. 83 42. 12 19. 04	o 277 315 325		45. 33 06. 51 23. 11	Robinson Sheep Remmel	47, 718. 80 47, 822. 25 34, 262. 61	4. 6786895 4. 6796300 4. 5348204
Chopaka (U. S. C. & G. S.)	48 57 119 47	27. 132 01. 016	18 83	46 00	38. 90 53. 05	198 262	39 42	58. 75 14. 63	TiffanyRemmel	33, 797. 23 30, 421. 03	4. 5288811 4. 4831739
Lemanasky (U. S. C. & G. S.)	48 44 119 37	35. 544 16. 176	70 115 153		57. 59 43. 19 06. 97	250 295 333	10 12 21	58. 67 46, 31 46, 58	Tiffany Remmel Chopaka	24, 247, 66 46, 701, 30 26, 650, 80	4. 3846698 4. 6693290 4. 4257102
Oroville (U. S. C. & G. S.)	48 53 119 20	44. 203 12. 879	51 102		01. 04 54. 51			10. 87 42. 18	LemanaskyChopaka	26, 888. 72 33, 451. 73	4. 4295702 4. 5244186
Anarchist (U. S. C. & G. S.)		40. 449 41. 405	25 68 347	13 04 00	12. 93 36. 18 48. 72	205 247 167	$\frac{02}{46}$	58. 93 59. 73 26. 05	Lemanasky Chopaka Oroville	39, 066, 48 30, 692, 30 18, 900, 72	4. 5918043 4. 4870294 4. 2764783
Osoyoos south base (U. S. C. & G. S.)	48 57 119 26		195 308	15 52	21. 42 08. 98	15 128	17 56	25, 96 50, 56	AnarchistOroville	12, 730, 93 9, 772, 14	4. 1048600 3. 9899890
Osoyoos north base (U. S. C. & G. S.)	49 01 119 28	41. 278 10. 697	236 326 346	01 32 08	28. 52 40. 03 24. 80	56 146 166	04 38 09	51. 90 40. 44 43. 50	Anarchist Oroville Osoyoos south base	6, 592, 44 17, 654, 04 8, 857, 349	3. 8190463 4. 2468440 3. 9473038
Gillespie	49 01 119 11	56. 798 54. 038	33 102	44 38	52. 80 25. 35	213 282	38 29	36. 52 31. 10	Oroville	18, 289. 70 14, 717. 09	4, 2622067 4, 1678220
Spur (U. S. C. & G. S.)		39. 908 43. 509	111 158	49 59	07. 21 23. 54	291 338	37 53	27. 28 58. 97	OrovilleGillespie	20, 390, 60 24, 391, 96	4. 3094299 4. 3872466
Bodie (U. S. C, & G. S.)	48 49 118 49		90 130	10 26	08. 81 17. 56	269 310	58 09	59. 20 42. 33	SpurGillespie	18, 143, 78 35, 231, 60	4. 2587278 4. 5469324
Greenwood (U. S. C. & G. S.)	49 04 118 43	22, 324 46, 627	15 43 82	21 18 42	27. 02 14. 06 07. 12	195 223 262	$\begin{array}{c} 16 \\ 02 \\ 20 \end{array}$	50. 01 26. 19 52. 60	Bodie Spur Gillespie	28, 288. 18 37, 376. 78 34, 556. 01	4. 4516050 4. 5726019 4. 5385236
Leona (U. S. C. & G. S.)	48 46 118 28		104 151	10 01	15. 12 27. 96	283 330	54 49	02, 69 50, 59	BodieGreenwood	27, 188. 38 38, 760. 60	4. 4343834 4. 5883908
Christina (U. S. C. & G. S.)	49 03 118 19	56. 271 51. 006	17 54 91	29 22 43	58. 35 08. 10 57. 54	197 233 271	23 59 25	33. 57 28. 51 52. 93	LeonaBodieGreenwood	34, 666, 94 45, 243, 15 29, 151, 24	4. 5399156 4. 6555528 4. 4646571
O'Toole (U. S. C. & G. S.)	48 48 117 52		84 131	15 10		263 310	48 50	32. 97 19. 53	LeonaChristina	43, 576. 78 43, 496. 22	4. 6392551 4. 6384513
Glory (U. S. C. & G. E.)	49 08 117 54		44 73 356	18 08 52	23. 26 51. 73 27. 12	223 252 176	52 49 53	58. 32 49. 26 43. 69	Leona_ Christina_ O'Toole	59, 106, 62 32, 055, 37 37, 974, 78	4. 7716361 4. 5059008 4. 5794953
Kelly (U. S. C. & G. S.)	49 08 117 25	22. 007 32. 296	42 92	30 04	01. 00 26. 03	222 271		19.30 24.36	O'Toole	49, 708. 31 35, 433. 94	4. 6964290 4. 5494193
Hall (U. S. C. & G, S.)	48 48 117 15	23. 942 21. 293	90 128 161	33 46 30	11. 16	270 308 341	16	16. 12 31. 83 35. 64	O'Toole Glory Kelly	46, 051, 06 61, 298, 70 39, 040, 27	4. 6632397 4. 7874513 4. 5915128
Snowy (U. S. G. S.)	48 59 116 59	31. 022 08. 557	43 117	58 11	30. 26 52. 33	223 296	46 51	17. 24 55. 87	HallKelly	28, 585, 74 36, 091, 73	4. 4561495 4. 5574077
Summit (U. S. C. & G. S.)		39. 412 45. 647	29 37 84	00 16 39	37.14	208 216 264		31. 63 18. 30 01. 62	Snowy Hall	51, 735. 29	4. 3728529 4. 7137869 4. 640491
Parker (U. S. C. & G. S.)	48 52 116 35	26. 064 12. 224	114	19	41, 57 56, 79 33, 64	294	01	27. 82 53. 88 34. 20	HallSnowy_Summit	49, 689, 41 32, 046, 38 38, 152, 72	4. 6962639 4. 5057790 4. 5815258
Kid (U. S. C. & G. S.)	49 15 116 11	04. 894 43. 573	34 80	24 10	44. 55 14. 93	214 259	$\begin{array}{c} 07 \\ 41 \end{array}$	00. 41 27. 03	ParkerSummit	50, 791. 78 46, 908. 65	4. 7057934 4. 6712529
Ewing (U. S. C. & G. S.)		45, 647 49, 225		18	16.64	261 293 336	39	35. 40 48. 04 51. 39	Parker Summit Kid	44, 884, 59 67, 922, 97 39, 106, 26	4, 652097; 4, 832016; 4, 592246;
Moyie (U. S. C. & G. S.)	49 15 115 45	14. 054 51. 347		41 38	56. 15 48. 63			08. 26 12. 67	EwingKid	39, 394, 04 31, 392, 12	4. 5954303 4. 4968207
Yaak (U. S. C. & G. S.)		01. 443 39. 810	84 119 141			264 298 320		27. 26 15. 46 49. 10	Ewing Kid Moyie	41, 910, 26 65, 417, 70 41, 019, 64	4. 6223204 4. 815695 4. 612991
Broadwoo 1 (U. S. C. & G. S.)	49 17 114 59	47, 384 22, 375			42. 10 26. 91			34. 58 13. 27	Yaak Moyie	47, 838, 53 56, 574, 48	4. 6797778 4. 7526200
Green		40. 241 59. 047	118	31	08. 04 22. 07 48. 42			30. 07 40. 05 14. 67	Yaak Moyie Broadwood	35, 007, 66 68, 870, 22 37, 518, 53	4, 544163 4, 838031 4, 5742458
Frost122824°—37——18	49 04 115 11	19. 036 07. 117	54 303	50 38	51.45 04.36	234 123		37. 92 29. 86	Yaak Green		4. 3057146 4. 346081

Station			de and tude	A	zim	uth	Bac	k az	imuth	To station	Distance (meters)	Logarithm
	0	,	11	0	,	11	0	,	"		Marian.	
Campbell	48 115	57 09	40.017 10.208	92 169 269	06 06 53			54 04 03	46, 18	Yaak Frost Green	18, 920. 39 12, 553. 20 16, 093. 74	4. 276930 4. 098754 4. 206657
Tuchuck	48 114	58 40	34. 783 25. 919			28. 44 02. 28	264 326	49 58	44. 53 42. 81	GreenBroadwood	19, 053, 39 42, 408, 76	4, 279972 4, 627455
Scarpe (U. S. C. & G. S.)			47. 833 04. 363	54			216 233 281		25. 13 55. 21 08. 01	Tuchuck Green Broadwood	33, 030. 19 47, 910. 43 43, 819. 09	4, 518911 4, 680430 4, 641663
Sunkist (U. S. C. & G. S.)			28. 968 40. 879	50 146	05 10	24. 09 12. 58	229 326	50 07	28, 80 38, 57	Tuehuck	31, 417. 19 7, 397. 42	4, 497167 3, 869080
Carter (U. S. C. & G. S.)	48	53	31. 437 36. 446	102 146	18 32	53. 73		51 17	53. 11 59. 76	TuchuckScarpeSunkist	44, 740. 24 42, 877. 81 35, 480. 44	4, 650698 4, 632232 4, 549989
Dungarvan (U. S. C. & G. S.)	49 113	09 58	18. 219 14. 264	90	50	28. 43 19. 54 07. 09	194 270 281	49 33	39. 89 20. 83	CarterSunkistScarpe	30, 260. 84 27, 287. 62 32, 052. 11	4. 480881 4. 435965 4. 505856
Crossley (U. S. C. & G. S.)			06. 740 25. 378	92 154	04 26	48. 09 10. 95	271 334	51 17	06. 04 15. 78	Carter Dungarvan	22, 239. 68 33, 287. 92	4. 347128 4. 522286
Beazer (U. S. C. & G. S.)	49		40. 363 49. 234	44	22 29	58. 71		08	56. 47	Crossley	32, 509. 78 37, 610. 04	4. 512014 4. 575303
Cracker (U. S. C. & G. S.)	48	43	55. 476 13. 768	119	01	10.36 04.77	298	41	19. 31 54. 83	CarterCrossley	36, 867, 65 19, 763, 53	4. 566645 4. 295864
Divide (U. S. C. & G. S.)	48 113	47 21	56. 574 34. 703	107	03 39 58		287	20	30. 32 24. 05 15. 45	Cracker Crossley Beazer	21, 719. 08 31, 869. 63 33, 733. 90	4. 336841 4. 503377 4. 528066
Mussetter (U. S. C. & G. S.)	48 113		57. 859 11. 701		21 34	25. 25 59. 18	241 302	06 15	49, 42 38, 70	Divide Beazer	27, 043, 77 37, 019, 21	4. 432067 4. 568427
Ross (U. S. C. & G. S.)			17. 238 51. 474		31 22 09			25 02	37. 30	Mussetter Divide Beazer	29, 775. 18 52, 704. 49 40, 995. 21	4. 473854 4. 721847 4. 612733
Landslide (U. S. C. & G. S.)			38. 285 29. 856			43. 24 06. 14	271 325	02 23	51. 57 44. 84	MussetterRoss	28, 957, 02 35, 196, 46	4. 461753 4. 546498
Ridge (U. S. C. & G. S.)			49. 361 44. 297	1	17 05	02. 73 16. 38 07. 40	238 353	09 03	54. 84	Mussetter Ross Landslide	13, 580. 56 21, 406. 08 19, 037. 96	4. 132917 4. 330537 4. 279620
/Boundary west base (U. S. C. & G. S.)			54. 554 34. 141	186 293	10 17		6 113	20	30.54	Mussetter Ross Ridge Landslide	11, 452, 54	4. 058902 4. 286646 3. 706575 4. 382486
Boundary east base (U. S. C. & G. S.)			55. 018 16. 823			40. 73 03. 91 08. 85	328	41	09. 56 49. 66 15. 78	Boundary west base Ross Landslide	13, 767, 665 22, 481, 99 12, 817, 33	4, 138860 4, 351834 4, 107797
Meeks (U. S. C. & G. S.)			21, 465 48, 912	51 56	51 13 30 36 44	45.49	230 236 241	56 07 10	30, 03 01, 23 23, 23 06, 99 51, 69	Landslide Boundary east base Ridge Boundary west base Ross	38, 622. 12 36, 706. 00 45, 236. 33 48, 181. 81 40, 328. 32	4. 586836 4. 564737 4. 655487 4. 682883 4. 605610
Senior (U. S. C. & G. S.)			24. 367 25, 652		29 40	27.73 49.79			17. 91 14. 55	Landslide Meeks	34, 493, 23 17, 261, 24	4. 537733 4. 237072
McCormick (U. S. C. & G. S.)	48 112		24, 868 51, 123	99 161		15. 51 36. 41	278	52	10. 25 38. 81	Landslide	37, 934, 66 25, 381, 78	4. 579036 4. 404522
Verdigris (U. S. C. & G. S.)		09	31. 729 29. 431	13 58	02 58	57. 52 57. 41 54. 36	192 238 281	58 49	09. 42 10. 56 31. 46	McCormick Senior Meeks	34, 459, 34 18, 382, 92 25, 247, 22	4. 5373076 4. 2644146 4. 4022136
West Butte (U. S. C. & G. S.)	48 111	55 31	53. 610 53. 363	79	31	47. 16 19. 62			41. 29 58. 28	McCormick Verdigris	44, 728. 76 44, 041. 10	4.650586 4.643858
Kippen (U. S. C. & G. S.)	49	12	00. 457 37. 288	7	36	40. 04 56. 18 43. 29	187 231	34 09	11. 91 18. 93 50. 84	West Butte McCormick Verdigris	30, 131, 80 61, 182, 79 40, 205, 16	4. 479025 4. 786629 4. 604281
Hill (U. S. C. & G. S.)			16, 975 25, 205		44	14. 54 59. 69	286	26	33. 52 44. 54	West ButteKippen	29, 929, 46 45, 627, 69	4. 4760989 4. 659228
Antelope (U. S. C. & G. S.)	49	05	19. 982 40. 713	28 68	53 02	33. 66 59. 23 03. 84	208	44 36	42. 21	Hill West Butte Kippen	29, 722, 90 46, 361, 22 40, 766, 23	4. 473091 4. 666154 4. 610300
Pinhorn (U. S. É. & G. S.)			24. 788 40. 911		40	18. 73 15. 12			42. 52 29. 95	HillAntelope	22, 986, 59 9, 199, 59	4. 361474 3. 963768
Milk (U. S. C. & G. S.)	49	03	38. 760 02. 315	51 65	23 16	08. 21 20. 81 49. 44	231 245	05 08	30. 12 18. 61 01. 75	Hill. Pinhorn	36, 600. 28	4. 5634844 4. 1549884 4. 161825

Station			e and ude	A	zim	uth	Bacl	c azi	muth	To station	Distance (meters)	Logarithm
New (U. S. C. & G. S.)	o 48 110	57	26. 773 47. 235	66 116 190	45 55	46. 81 49. 04 03. 03	o 246 296 10	29 49 31	28. 62 06. 38 22. 22	Hill Pinhorn Milk	28, 795, 13 12, 165, 30 11, 687, 43	4. 4593190 4. 0851227 4. 0677191
Joplin (U. S. C. & G. S.)	48 110	35 44	15, 942 13, 833	135 175	10 39	18. 94 32. 26	314 355	52 37	08. 22 36. 89	Hill New	41, 967. 70 41, 228. 99	4. 6229152 4. 6152027
Goldstone (U. S. C. & G. S.)	48 110		55. 681 18. 684	29 86 111 136	17 35 31 05	17. 59 50. 06 45. 93 16. 40	209 266 291 315	06 06 18 53	04. 73 22. 65 35. 54 24. 53	Joplin Hill New Milk	37, 499, 07 47, 918, 19 22, 931, 02 27, 621, 52	4.5740205 4.6805004 4.3604234 4.4412476
Sage (U. S. C. & G. S.)			18. 394 03. 774	11 51 67	56 41 47	06. 46 21. 91 16. 34	191 231 247	52 24 31	08. 73 12. 01 24. 94	GoldstoneNewMilk	31, 024. 64 35, 349. 57 27, 598. 11	4. 4917068 4. 5483841 4. 4408794
Govanlock (U. S. C. & G. S.)	49 109	07 59	44. 592 15. 763	53 95	20 38	28. 11 40. 00	232 275		47.31 54.57	GoldstoneSage	45, 789. 67 30, 298. 26	4. 6607675 4. 4814177
Simpson (U. S. C. & G. S.)	48 109	52 56	51. 112 36. 582	90 132 173	24 30 19	27. 08 50. 37 52. 83	269 312 353	59 10 17	48. 93 06. 88 52. 69	Goldstone Sage Govanlock	39, 976, 67 45, 280, 62 27, 789, 99	4. 6018066 4. 6559124 4. 4438884
Signal (U. S. C. & G. S.)	48 109	56 47	42. 096 58. 000			19.30 40.48	235 326		48. 44 08. 68	Simpson Govanlock	12, 743. 95 24, 664. 72	4.1053041 4.3920762
Nashlinn (U. S. C. & G. S.)	49 109		04.750 40.038	50	06 08 36	45. 95 16. 28 43. 33	226 229 275	55 50 16	12. 91 12. 25 36. 92	Signal Simpson Govanlock	25, 493. 78 38, 130. 99 32, 506. 70	4. 4064343 4. 5812781 4. 5119729
Havre north base (U.S.C. & G.S.)	48 109		49. 885 45, 160	73 89 192	59 09 21	11. 59 08. 34 22. 23	253 268 12	43 59 23	28. 36 55. 71 42. 00	Simpson Signal Nashlinn	26, 526. 44 14, 913. 83 17, 548. 53	4. 4236789 4. 1735892 4. 2442407
Havre south base (U.S.C. & G.S.)	48 109		24. 197 19. 083	114 141 178 185	25	22.90	294 320 358 5	30 53 25 05	25, 88 51, 36 19, 03 19, 24	SimpsonSignalHavre north baseNashlinn	28, 666, 80 24, 568, 82 19, 335, 30 36, 612, 11	4. 4573792 4. 3903843 4. 2863509 4. 5636248
Old Man (U. S. C. & G. S.)	49 109	10 13	00. 962 09. 500	31 73		59. 82 44. 51	211 252	34 46	16.81 59.29	Havre south baseNashlinn	51, 445. 87 24, 825. 27	4. 7113505 4. 3948940
Cherry (Geodetic Survey of Canada)	48 108		29. 682 17. 393	76 120 149	28	11. 07 59. 75 09. 06	256 300 329	07 02 07	33. 65 18. 05 10. 27	Havre south base Nashlinn Old Man	49, 963, 40	4. 6802510 4. 6986520 4. 5774989
Lucky (Geodetic Survey of Canada)	49 108	05 51		16 107	04 14		196 286			CherryOld Man		4,4042918 4,4394960
Claydon (Geodetic Survey of Canada)	49 108	19 53	03, 681 26, 318	5 55 354	06		185 234 174	51		Cherry Old Man Lucky	29, 221, 12	4. 6942948 4. 4656969 4. 3973840
Alkali (Geodetic Survey of Canada)	48 108	58 35	05. 449 33. 222	68 125 150	48		248 305 330			Cherry Lucky Claydon	28, 504. 45 24, 000. 19 44, 540. 86	4. 4549127 4. 3802147 4. 6487586
Rapdan (Geodetic Survey of Canada)	49 108		05, 741 00, 486	1 55 116	37	40.95	181 235 296		52. 42 10. 43 04. 65	AlkaliLuckyClaydon	27, 819. 83 24, 385. 49 24, 941. 68	4. 4443544 4. 3871315 4. 3969257
Center (Geodetic Survey of Canada)	49 108	05 28	45, 334 29, 657	31 149			211 329			AlkaliRapdan	16, 608. 92 15, 742. 10	
Climax (Geodetic Survey of Canada)	49 108		09. 393 08. 115	34 37 95		09.67	213 216 275		35.68	AlkaliCenterRapdan	14, 860. 45	4. 1720318
Big Butte (Geodetic Survey of Canada)	48 108	57 19		93 144 176	42	55. 97	273 324 356	36	12.38	AlkaliCenterClimax		4, 2904835 4, 2735386 4, 4352678
Edmund (Geodetic Survey of Canada)	49 108	10 07	18. 276 13. 108	32 101			212 281			Big Butte	28, 120, 15 17, 253, 72	
Porter (Geodetic Survey of Canada)	48 108		49, 589 21, 151	98 143 167	02	11, 42	278 322 347	48	00.03	Big Butte Climax Edmund	37, 940, 43	4. 5791023
Roche (Geodetic Survey of Canada)	49 107	11 52	11. 321 16. 955	23 84			203 264					
Monchy (Geodetic Survey of Canada)	49 107		42, 938 25, 843	62 127 166		11. 24	241 307 346		59.30			4. 4618716
70 Mile Butte (Geodetic Survey of Canada).	49 107		46, 545 04, 226	29 86				00 02	05. 01 17. 92	MonchyRoche		
Whitewater (Geodetic Survey of Canada).	48 107		43, 496 09, 674	96 134 165	02	25. 22	313		43.52	Roche	_ 30, 628. 89	4, 4861313

Station			de and itude	1	zim	uth	Bac	k az	imuth	To station	Distance (meters)	Logarithm
Long	o 48	,	24, 252	0	1 28	11		/	//	Whitewater	01 501 00	
Long	107	16				59. 34 10. 01	281 314		55. 53 22, 45	Whitewater70 Mile Butte	21, 561, 07 37, 973, 45	4. 333670- 4. 5794800
Wideview (Geodetic Survey of Canada)	49 107	17 14		3 35 70	39	12. 80 45. 42 58. 93	183 215 250	25	44. 36 11. 16 40. 23	Whitewater70 Mile Butte	37, 171, 82 40, 303, 13 31, 146, 48	4. 5702138 4. 6053388 4. 4934090
Blum (Geodetic Survey of Canada)	49 107	08 09	21. 742 55. 841	22 160		21. 01 16. 82	202 340	29 12	07. 65 31. 23	Long Wideview	21, 989. 13 17, 835. 22	4. 342208 4. 251278
Peaked Butte (Geodetic Survey of Canada).	49 106		42, 778 55, 328		58	57. 26 15. 59 59. 20	232 259 292	52 43 08	36. 84 07. 28 04. 29	Long Blum Wideview	41, 033, 21 24, 711, 19 32, 763, 08	4. 6131358 4. 3928936 4. 5153848
Thoeny (Geodetic Survey of Canada)			02, 954 01, 008	103 138 178	11	56. 80 38. 67 31. 43	283 317 358	10 55 03	58, 15 51, 46 50, 41	Long Blum Peaked Butte	34, 938. 36 38, 155. 31 32, 758. 42	4. 5433024 4. 5815550 4. 5153230
Clay Butte (Geodetic Survey of Canada) .	49 106	10 36	31. 333 37. 503	25 91		49. 28 13. 92	204 271		27. 89 10. 17	ThoenyPeaked Butte		4. 5530934 4. 2085232
Roanwood (Geodetic Survey of Canada)	48 106		00. 489 48. 827	80 142 168	18 57 30	32. 15 12. 37 27. 07	260 322 348	43	34. 32 31. 77 49. 05	ThoenyPeaked ButteClay Butte	21, 333, 26 36, 525, 61 29, 346, 96	4. 3290573 4. 5625974 4. 4675631
Glentana (Geodetic Survey of Canada)	48 106	53 18	17. 470 37. 945	101 145	15 38	32. 96 19. 31	281 325	05 24	36. 96 44. 16	Roanwood Clay Butte		4. 2153283 4. 5881780
Table Butte (Geodetic Survey of Canada).	49 106		07. 495 35. 644	5 39 104	33 39 37	00, 09 32, 04 17, 37	185 219 284	31 28 22	27. 79 02. 67 08. 39	Glentana Roanwood Clay Butte	25, 761, 01 29, 131, 83 25, 157, 97	4. 4109629 4. 4643677 4. 4006755
Richland (Geodetic Survey of Canada)	48 106	55 01	05, 552 27, 916			51. 23 15. 45	260 320	50 18	55. 00 50. 18	Glentana Table Butte	21, 241, 10 28, 940, 47	4. 327177 4. 4615058
Quantock (Geodetic Survey of Canada)	49 106	10 03	50, 733 14, 404	67 355	04 45	19. 42 12. 20	246 175	54 46	13. 33 32. 62	Table Butte	17, 841, 08 29, 278, 32	4. 2465255 4. 466546
Templeman (Geodetic Survey of Canada).	48 105		31. 408 10. 008		30 54 00	22.04	279 309 341	11 48 52	39. 54 06. 94 36. 28	Glentana	31, 560, 49 13, 214, 91 39, 618, 79	4. 4991438 4. 1210642 4. 5979012
Fife Lake (Geodetic Survey of Canada)	49 105		45, 802 40, 418	11 33 101	14 38 37	39. 72 44. 87 34. 12	191 213 281	10 28 25	31. 00 20. 04 47. 49	Templeman Richland Quantock	34, 465, 05 30, 407, 30 19, 311, 72	4, 5373789 4, 4829779 4, 2858210
Poplar (Geodetic Survey of Canada)	49 105	01 35	20. 966 10. 073	47 132	43 08	15. 42 46. 02	227 311	29 59	41. 22 19. 00	Templeman Fife Lake		4. 4736619 4. 311969
Eddyside (Geodetic Survey of Canada)	49 105	06 21	52. 875 19. 704	52 58 96	$\frac{13}{46}$ $\frac{22}{22}$	43. 18 26. 55 43. 94	231 238 276	49 35 02	41. 92 59. 21 48. 60	Templeman Poplar Fife Lake	49, 277. 02 19, 728. 72 32, 235. 19	4. 6926444 4. 2950990 4. 508330
Madoc (Geodetic Survey of Canada)	48 105	48 19	27. 902 05. 250	95 140 175	26 39 25	25, 07 36, 25 58, 65	275 320 355	00 27 24	45. 98 29. 03 17. 24	Templeman Poplar Eddyside	41, 881. 60 30, 922. 41 34, 243. 53	4. 6220232 4. 4902733 4. 5345788
Whitetail (Geodetic Survey of Canada)	48 105	57 13	03. 873 14. 811	24 151	10 37	05. 06 23. 41	204 331		41, 07 17, 28	MadocEddyside	17, 465, 09 20, 690, 14	4. 2421708 4. 3157634
Flaxville (Geodetic Survey of Canada)	48 105		01, 180 53, 110	106 155 159	34	50.78 24.37 47.32	286 335 339	47 23 08	40. 01 30. 93 59. 86	Madoc_ Eddyside_ Whitetail_	15, 616. 98 42, 498. 19 21, 899. 81	4. 1935971 4. 6283704 4. 3404404
Mervin (Geodetic Survey of Canada)			59. 777 27. 256		23 17 37		190 235 291		03. 36 26. 02 57. 12	Flaxville Whitetail Eddyside	30, 103, 02 16, 026, 75 24, 703, 32	4. 4786101 4. 2048454 4. 3927553
Ross (Geodetic Survey of Canada)	48 104	59 45	49. 962 33. 660	45 101	39 07	01. 66 27. 23	225 280	22 54	57. 77 42. 08	Flaxville Mervin	36, 537. 25 20, 983. 00	4. 5627359 4. 3218676
Plentywood (Geodetic Survey of Canada).	48 104	43 44	07. 816 07. 546	101 147 176	00 27 45	29. 93 42. 51 49. 45	280 327 356	43 13 44	23, 35 54, 11 44, 60	Flaxville Mervin Ross	28, 408. 51 41, 531. 16 31, 006. 84	4. 4534484 4. 6183741 4. 4914575
Bruce (Geodetic Survey of Canada)	48 104	56 32	41. 865 48. 321	28 110	55 33	12, 14 03, 26	208 290		40. 83 25. 91	PlentywoodRoss	28, 709. 51 16, 614. 56	4. 4580258 4. 2204887
Dooley (Geodetic Survey of Canada)	48 104	51 23	42. 107 01. 326	58 118 127	33 50 49	14. 38 29. 93 21. 15	238 298 307	17 33 41	21. 79 30. 40 58. 78	Plentywood	30, 337, 48 31, 381, 91 15, 121, 27	4. 4819795 4. 4966794 4. 1795883
Tangedal (Geodetic Survey of Canada)	49 104	04 20	18. 911 38. 995	7 46 74	04 28 51	25. 83 04. 65 06. 64	187 226 254	02 18 32	38. 47 54. 15 18. 01	Dooley Bruce Ross	23, 557, 29 20, 470, 26 31, 476, 01	4. 3721254 4. 3111234 4. 4979797
Trees (Geodetic Survey of Canada)	49 104	04 02	20. 474 11. 383	47 89	28 59	16. 23 35. 53	227 269	12 45	33. 35 38. 68	Dooley Tangedal	34, 571. 15 22, 481. 01	4. 5387138 4. 3518157
Alkabo (Geodetic Survey of Canada)	48 103	52 53	19. 176 28. 975	88 124 154	22 01 33	10. 80 11. 34 43. 13	267 303 334	59 40 27	55, 89 41, 66 09, 03	Dooley Tangedal Trees	36, 139, 10 39, 916, 06 24, 685, 28	4. 5579773 4. 6011477 4. 3924380
Agate (Geodetic Survey of Canada)		01 50	29. 351 42. 307	11	18	06. 17 06. 28	191	16	00. 48 25. 84	Alkabo	17, 330, 65 14, 957, 89	4. 2388149 4. 1748702

	Station			le and	A	zim	uth	Back	c az	imuth	To station	Distance (meters)	Logarithm
		0	,	"	0	,	11.	0	,	,,			
	Norge (U. S. C. & G. S.)	48 103	53	38. 110 21. 176	72 137 164		49. 06 23. 84 19. 98	251 317 344	56 32	11. 97 12. 16 48. 28	Alkabo Trees Agate	7, 880, 17 26, 858, 83 15, 121, 33	3. 8965356 4. 4290870 4. 1795901
	Pole (Geodetic Survey of Canada)	48 103	57 46	53. 287 15. 516	9 140	37 55	47. 00 56. 49	189 320	36 52	57. 50 35. 16	NorgeAgate	7, 995. 23 8, 600. 15	3, 9028308 3, 9345063
1	Messers (Geodetic Survey of Canada)	49 103		54. 162 48. 770	31 46 86	02 36 45	02. 08 50. 34 51. 97	210 226 266	56 31 37	20. 84 58. 47 38. 53	Norge Pole Agate	17, 874, 64 10, 824, 46 13, 298, 48	4. 2522373 4. 0344064 4. 1238020
	Ambrose (U. S. C. & G. S.)	48 103		47. 703 54. 531	83 107 140	59 06 32	46, 99 13, 62 32, 32	263 286 320	47 54 25	23. 45 39. 19 49. 29	Norge Pole Messers	20, 208. 05 19, 600. 08 17, 076. 31	4. 3055243 4. 2922579 4. 2323941
	Crosby (U. S. C. & G. S.)	48 103	51 33	33. 579 29. 017	102 207	52 40	09. 59 33. 04	282 27		42. 73 29. 43	NorgeAmbrose	17, 387, 20 6, 772, 40	4. 2402298 3. 8307424
	Ambrose southwest base (U. S. C. & G. S.).	48 103	57 37	06. 622 01. 856	63 299 337		10. 61 00. 97 55. 28	242 119 157	53	23, 75 37, 91 35, 68	Norge Ambrose Crosby	14, 157, 89 8, 620, 44 11, 163, 80	4. 1509985 3. 9355296 4. 0478121
	Ambrose northeast base (U. S. C. & G. S.)=School.	$\frac{48}{103}$	59 29	23, 575 10, 462	13 66	57 14	50, 22 17, 93	193 246		31.73 22.32	Ambrose Ambrose southwest base	8, 781. 15 10, 479. 18	3. 9435512 4. 0203272
4	Bowie (U. S. C. & G. S.)		59 44	55. 870 00. 917	19 273 300 301 320	03 40 29	10. 70 40. 60 19. 84 07. 04 36. 33	199 93 120 121 140	13 14 50 34 24	39. 69 52. 58 12. 94 23. 19 32. 72	Norge School Ambrose Ambrose southwest base Crosby	12, 360, 50 18, 129, 03 18, 616, 35 9, 998, 08 20, 154, 31	4. 0920360 4. 2583745 4. 2698945 3. 9999167 4. 3043680
	Schnell (Geodetic Survey of Canada)	49 103	03 29	25. 072 12, 803	7 77	23 47	04.71 56.36	187 257	21 39	47. 96 56. 07	Ambrose	16, 115, 57 13, 217, 10	4, 2072458 4, 1211361
	Hansen (Geodetic Survey of Canada)	48 103		16. 562 16. 635	68 120 160	16 33 05	47, 73 08, 19 28, 26	248 300 340	$\frac{12}{22}$ 02	33. 01 10. 14 30. 03	Ambrose Messers Schnell	7, 405, 83 20, 571, 97 14, 080, 96	3, 8695739 4, 3132759 4, 1486322
	Gardner (Geodetic Survey of Canada)			39, 659 56, 478	33 71		19.31 26,89	213 250		31, 10 39, 80	HansenSchnell	23, 005. 35 18, 386. 87	4, 3618289 4, 2645079
	Peterson (Geodetic Survey of Canada)			42, 300 39, 170	94 128 179	43 55 00	23.68	274 308 359	44	48. 75 24. 42 21. 92	Hansen Schnell Gardner	13, 017, 63 22, 798, 95 20, 309, 99	4. 1145319 4. 3579148 4. 3077097
	Estevan (Geodetic Survey of Canada)	49 102	07 54	18.331 59.267	48 87	13 18	55.33 31.00	227 267	59 03	04. 51 25. 86	PetersonGardner	32, 201, 19 24, 307, 29	4. 5078719 4. 3857366
	Cook (Geodetic Survey of Canada)			51.057 10.939	113 141 178			320	45	41. 49 25. 94 17. 71	Peterson Gardner Estevan	27, 276, 22 40, 155, 44 32, 366, 75	4. 4357842 4. 6037443 4. 5100991
	Dunbar (Geodetic Survey of Canada)			24.712 07.820	36 116		49, 36 21, 96			$13.67 \\ 08.35$	Cook Estevan	28, 921, 72 20, 236, 91	4, 4612241 4, 3061442
	Short Creek (Geodetic Survey of Canada).			30, 439 28, 446	33 144 221	39		213 324 42	32	54. 44 06. 06 58. 40	Cook Estevan Dunbar	19, 252, 19 20, 007, 37 9, 738, 29	4, 2844802 4, 3011900 3, 9884826
	Lignite (Geodetic Survey of Canada)	48 102	52 32	36, 556 51, 462	79 125 154	$\frac{02}{25}$	56, 29	305	16	35, 38 25, 63 55, 42	Cook_ Short Creek Dunbar	26, 579, 15 18, 893, 23 20, 221, 47	4, 4245410 4, 2763063 4, 3058128
	Spy (Geodetic Survey of Canada)		$\begin{array}{c} 01 \\ 17 \end{array}$	26, 430 28, 948	49 93		21, 94 27, 90	228 273	$\frac{48}{35}$	46. 23 21. 85	Lignite Dunbar	24, 904, 42 27, 661, 52	4, 3962764 4, 4418760
	Portal (Geodetic Survey of Canada)	48 102	59 32	56, 215 59, 474	117 261 359	31	16, 82 06, 91 40, 67	297 81 179	42	53, 45 49, 31 46, 71	Dunbar Spy Lignite	9, 838, 17 19, 113, 93 13, 582, 56	3. 9929142 4. 2813499 4. 1329817
	Flaxton (Geodetic Survey of Canada)			07, 525 33, 291	80 123 190	16 22 33	41, 17 35, 97 14, 11	260 303 10	12	39. 79 27. 99 47. 90	Lignite Portal Spy	16, 500, 66 19, 623, 38 13, 792, 27	4, 2175013 4, 2927737 4, 1396357
	McGillivray (Geodetic Survey of Canada).	48 102	$\frac{54}{02}$	31, 984 08, 932	88 124	$\frac{04}{28}$	29, 00 30, 23	267 304	51 16	21. 94 56. 24	FlaxtonSpy	21, 281, 35 22, 673, 46	4. 3279991 4. 3555178
	Martin (Geodetic Survey of Canada)			19, 333 49, 612	49 84 347	53 01 13	01.79 54.06 46,54	229 263 167	41 52 15	55. 17 20, 71 47. 76	Flaxton Spy McGillivray	23, 533, 46 15, 511, 02 14, 802, 27	4. 3716857 4. 1906404 4. 1703282
	Bluel (Geodetic Survey of Canada)	48 101	55 51	26, 067 39, 461	82 128	38 33	19, 64 10, 40	262 308	30 23	25. 18 14. 24	McGillivray Martin	12, 924, 55 20, 521, 20	4, 1114153 4, 3122028
	Goertz (Geodetic Survey of Canada)	49 101	03 49	54. 460 59. 779	7 40 80	21 32 51	45, 25 48, 44 19, 58	187 220 260	20 23 40	30, 02 38, 25 07, 49	Bluel McGillivray Martin	15, 835, 24 22, 840, 49 18, 305, 49	4. 1996246 4. 3587055 4. 2625813
	Harris (Geodetic Survey of Canada)	49 101	03 37	20, 240 46, 782	49 94	13 08	06, 54 24, 88	229 273	02 59	38. 21 11. 18	BluelGoertz.	22, 386, 15 14, 918, 49	4, 3499795 4, 1737248
	Trout (Geodetic Survey of Canada)	48 101	53 38	10, 240 38, 799	104 145 183	51 14 12	58, 50 18, 27 28, 35	284 325 3	42 05 13	10. 18 44. 52 07. 59	Bluel. Goertz. Harris.	16, 442, 37 24, 245, 08 18, 873, 46	4. 2159644 4. 3846237 4. 2758515

Station			de and tude	A	zim	uth	Bac	k az	imuth	To station	Distance (meters)	Logarithm
	0	,	"	0	,	"	0	,	"		04 000 00	4 2004222
Gainsborough (Geodetic Survey of Canada)	101	02 24	42, 081 30, 965	44 94	23 15	59, 15 20, 68	224 274	13 05	19. 61 19. 61	TroutHarris	24, 686, 89 16, 202, 53	4. 3924663 4. 2095828
Mohall (Geodetic Survey of Canada)	48 101	53 24	32, 275 24, 157	87 138 179	51 08 32	01, 82 19, 50 01, 10	267 317 359	$\frac{40}{58}$	17, 90 13, 99 55, 97	Trout Harris Gainsborough	17, 423, 36 24, 419, 87 16, 984, 85	4, 2411318 4, 3877434 4, 2300618
Lyleton (Geodetic Survey of Canada)	49 101	03 10	41, 630 34, 658	41 83	57 54	03.21 17.40	221 263	46 43	37. 40 45. 73	Mohall Gainsborough	25, 276, 01 17, 080, 09	4, 4027084 4, 2324903
Westhope (Geodetic Survey of Canada)	48 101	54 07	19, 391 28, 849	86 126 167	$04 \\ 52 \\ 44$	48, 89 11, 14 50, 84	265 306 347	52 39 42	03. 80 20. 03 30. 64	Mohall_ Gainsborough Lyleton	20, 730, 21 25, 946, 11 17, 774, 56	4. 3166038 4. 4140722 4. 2497988
Hayden (Geodetic Survey of Canada)	49 100	03 58	57. 262 03. 062	32 88	51 15	26. 93 57. 76	212 268	44 06	20. 02 29. 97	Westhope Lyleton	21, 236. 78 15, 265. 19	4. 3270887 4. 1837022
Malme (Geodetic Survey of Canada)	48 100	56 54	01. 906 21. 469	78 125 162	54 46 58	26, 64 35, 69 15, 54	258 305 342	44 34 55	33. 12 21. 23 28. 30	Westhope Lyleton Hayden	16, 339, 95 24, 351, 92 15, 359, 76	4. 2132507 4. 3865332 4. 1863843
Souris (Geodetic Survey of Canada)	48 100	57 45	06, 865 48, 782	79 130	09 25	58. 47 39. 25	259 310		31. 88 25. 01	Malme	10, 624, 09 19, 580, 74	4. 0262918 4. 2918292
Temple (Geodetic Survey of Canada)	49 100	04 44	46, 181 10, 350	8 37 84	02 32 58	02, 30 51, 57 40, 53	188 217 264	00 25 48	10.31	Souris Malme Hayden	14, 329. 30 20, 409. 75 16, 968. 60	4, 1562251 4, 3098376 4, 2296460
Johnson (Geodetic Survey of Canada)	48 100	58 28	17. 747 59. 264	84 123	01 03	09. 94 00. 99	263 302	48 51		SourisTemple	20, 651, 71 22, 058, 61	4. 3149561 4. 3435782
/ Declercq (Geodetic Survey of Canada)	49 100	04 29	44. 386 58. 655	53 90 354	53 16 13	35. 04 23. 32 31. 01	233 270 174	41 05 14	37. 80 39. 77 15. 85	Souris	23, 926, 89 17, 284, 27 12, 004, 74	4. 3788862 4. 2376511 4. 0793529
Scott (Geodetic Survey of Canada)	49 100	04 10	02. 496 56. 239	64 93	17 18	16.36 51.22	244 273	$\frac{03}{04}$	38.75 28.07	Johnson Declercq	24, 446. 79 23, 222. 96	4. 3882218 4. 3659175
Summit	48 100	59 25	57. 764 46. 503	51 149 247	46 58 13	12.82 53.86 05.57	231 329 67	43 55 24	43.44	Johnson Declercq Scott	4, 990. 63 10, 228. 67 19, 600. 29	3. 6981552 4. 0098192 4. 2922625
Olie (Geodetic Survey of Canada)	48 100	53 12	03, 883 40, 998	116 128 185	03 44 57	49. 55 10. 85 59. 93	295 308 5	51 34 59	18. 54	Johnson Summit Scott	22, 147, 98 20, 468, 98 20, 456, 75	4. 3453342 4. 3110961 4. 3108367
Dunseith (Geodetic Survey of Canada)	48 100	55 00	30. 076 07. 890	73 140	40 17	17. 29 14. 99	253 320	30 09	49. 74 05, 70	Olie Scott	15, 988. 03 20, 597. 80	4. 2037950 4. 3138208
Ninga H (Geodetic Survey of Canada)	49 99	01 59	51, 253 57, 899	0 43 106		22, 39 55, 22 25, 84	180 223 286	59 32 48	14. 85 19. 67 08. 61	Dunseith Olie Scott	11, 776. 87 22, 503. 26 13, 969. 64	4. 0710298 4. 3522454 4. 1451852
Ram (Geodetic Survey of Canada)	49 99	11 51	57. 173 34. 784	28 58	38 12	47. 53 26. 01	208 237	32 57	27. 16 47. 67	Ninga H. Scott	21, 318. 26 27, 737. 83	4. 3287517 4. 4430725
St. John (Geodetic Survey of Canada)	48 99	54 44	19. 836 55, 928	96 127	45 20	37. 96 03. 22	276 307	34 08	10. 58 42. 83	Dunseith Ninga H	18, 694. 44 23, 043. 60	4. 2717124 4. 3625504
Lena (Geodetic Survey of Canada)	49 99	01 40	16. 215 03. 659	24 92 144	40	13. 31 46. 75 39. 86	204 272 324	$\frac{46}{25}$	32, 85 45, 09 57, 39	St. John Ninga H Ram	14, 169, 97 24, 285, 75 24, 259, 75	4. 1513689 4. 3853516 4. 3848863
Killarney (Geodetic Survey of Canada)	49 99		21. 685 45. 076	56 102 357	07 42 08	45. 13 19. 60 28. 03	235 282 177	53 34 08	13. 74 07. 88 59. 33	Ninga H Ram Lena	28, 204. 27 13, 483. 46 16, 871. 66	4. 4503149 4. 1298012 4. 2271578
Margaret (N. W. Base) (Geodetic Survey of Canada).	49 99	21 53	27. 071 20. 125	12 323	32 19	35, 34 16, 80	192 143	27 28	34. 25 48. 92	Ninga H Killarney	37, 206. 25 25, 604. 27	4. 5706159 4. 4083124
Fairhall (S. E. Base) (Geodetic Survey of Canada).	49 99	17 39	14. 897 23. 626	7 41 114	21 21 50	52.10 44.58 45.76	187 221 294	20 06 40	50. 41 10. 81 11. 37	Killarney Ninga H Margaret	12, 871. 20 37, 941. 54 18, 602. 61	4. 1096192 4. 5791149 4. 2695739
Mowbray (Geodetic Survey of Canada)	49 99	09 18	53. 682 30. 765	58 91	46 58	35. 57 24. 13	238 271	30 41	18. 43 34. 54	Lena Killarney	30, 717, 77 27, 043, 46	4. 4873896 4. 4320623
Holmfield (Geodetic Survey of Canada)	49 99	07 28	04. 559 56. 001	51 113 247	37 02 31	06. 93 22. 12 45. 44	231 292 67	53	42. 51 25. 80 38. 32	Lena_ Killarney_ Mowbray	17, 304, 82 15, 607, 81 13, 707, 36	4. 2381670 4. 1933421 4. 1369539
Taylor (Geodetic Survey of Canada)	49 99		56. 380 48. 231	91 135 185	32 42 24	55. 54 21. 76 04. 45	271 315 5	35	37. 99 27. 94 03. 00	LenaHolmfield Mowbray	24, 703. 44 15, 905. 93 16, 672. 63	4. 3927575 4. 2015591 4. 2220041
Clearwater (Geodetic Survey of Canada)	49 99	08 08	39. 658 15. 003	44 100	34 27	52, 20 01, 39	224 280		08. 38 15. 59	TaylorMowbray	20, 068. 18 12, 685. 10	4. 3025080 4. 1032938
Sarles (Geodetic Survey of Canada)	48 99	58 04	28. 525 16. 012	103 140 165	38 44 36	55, 92 53, 85 42, 38	283 320 345	34	12. 42 08. 09 41. 85	Taylor Mowbray Clearwater	19, 492, 93 27, 367, 84 19, 492, 57	4. 2898772 4. 4372406 4. 2898692
Fallison (Geodetic Survey of Canada)	48 98	58 53	04. 646 29. 214	93 137	16 34	38, 74 42, 91	273 317	08 23	30. 81 33. 83	SarlesClearwater	13, 175. 12 26, 613. 04	4. 1197546 4. 4250945

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POSITIONS OF TRIANGULATION AND TRAVERSE STATIONS

Station			le and tude	A	zim	uth	Bac	c az	imuth	To station	Distance (meters)	Logarithm
Pilot Mound (Geodetic Survey of Canada).	o 49 98		28. 870 42. 839	o 22 61 356	, 44 34 59	49. 19 24. 03 51. 64	0 202 241 177	7 37 24 00	77 35, 95 09, 37 47, 28	Sarles Clearwater Fallison	30, 146, 06 18, 717, 19 28, 590, 30	4. 479230 4. 272240 4. 456218
Star Mound (Geodetic Survey of Canada)_	49 98	03 43	34. 519 26. 363	50 69 143	18 42 19	28. 65 43. 92 14. 08	230 249 323	$\frac{10}{27}$ $\frac{10}{10}$	53. 57 00. 55 42. 44	Fallison Sarles Pilot Mound	15, 934, 62 27, 094, 24 22, 915, 35	4. 202341 4. 432876 4. 360126
Manitou (Geodetic Survey of Canada)	49 98	15 33	28. 269 16. 266	29 82	$\frac{20}{04}$	24, 54 05, 77	209 261	12 47	42. 99 51. 24	Star Mound Pilot Mound	25, 278, 18 26, 284, 60	4. 402748 4. 41970
Maida (Geodetic Survey of Canada)	48 98	58 24	21. 902 10. 854	112 127 160	28 12 49	43, 49 19, 08 35, 52	292 306 340	14 49 42	11, 20 14, 39 43, 17	Star Mound Pilot Mound Manitou	25, 387, 90 46, 541, 71 33, 580, 53	4. 404626 4. 667842 4. 526087
Cavers (Geodetic Survey of Canada)	48 98	57 36	34. 337 42. 535	143 187 264	37 09 25	50, 65 55, 55 54, 12	323 7 84	32 12 35	45. 83 31. 48 21. 13	Star Mound Manitou Maida	13, 825, 74 33, 438, 84 15, 359, 57	4. 140688 4. 524251 4. 186379
Kaleida (Geodetic Survey of Canada)	49 98	07 29	07. 536 12. 924	27 162 339	19 21 16	39. 36 23. 89 22. 11	207 342 159	13 18 20	59. 83 19. 71 10. 24	Cavers Manitou Maida	19, 923, 13 16, 234, 81 17, 357, 87	4. 299357 4. 210447 4. 239496
Darlingford (Geodetic Survey of Canada)	49 98	$\frac{14}{22}$	18, 964 54, 725	2 29 99	59 55 43	51. 61 35. 43 52. 48	182 209 279	58 50 33	54. 06 49. 23 01. 63	Maida Kaleida Manitou	29, 606, 02 15, 372, 24 12, 751, 66	4. 471380 4. 186737 4. 105566
Numedahl (Geodetic Survey of Canada).	49 98	01 07	13. 955 32. 970	75 142	25 28	19. 10 46. 90	255 322	12 17	46. 03 09. 88	Maida Darlingford	20, 969, 25 30, 615, 42	4. 321582 4. 485940
North Star (Geodetic Survey of Canada).	49 98	05 14	34. 514 03. 112	42 146 315	47 26 25	36, 60 32, 89 07, 07	222 326 135	39 19 30	57.71 50.68 01.77	Maida Darlingford Numedahl	18, 193, 34 19, 454, 51 11, 293, 04	4. 259912 4. 289020 4. 052810
Morden (Geodetic Survey of Canada)	49 98	11 01	33, 549 05, 381	22 54 101	22 57 03	09. 94 00. 44 10. 04	202 234 280	17 47 46	16. 95 12. 21 38. 65	Numedahl North Star Darlingford	20, 692, 12 19, 274, 14 26, 987, 04	4. 315805 4. 284975 4. 431155
Plum Coulee (Geodetic Survey of Can- ada).	49 97	08 45	30. 221 10. 787	63 106	48 25	51. 61 25. 45	243 286	31 13	57.40 23.18	Numedahl	30, 388. 94 20, 150. 45	4. 48271. 4. 30428
Walhalla (Geodetic Survey of Canada)	48 97	54 53	09. 709 56. 677	128 164 201	22 56 50	12.54	308 344 21	11 50 57	49. 53 48. 75 07. 86	Numedahl Morden Plum Coulee	21, 153, 60 33, 400, 62 28, 649, 57	4. 325384 4. 523754 4. 457118
Neche (Geodetic Survey of Canada)	48 97	59 32	30. 382 18. 068	69 136	35 50		249 316	18 40	48. 33 24. 19	Walhalla Plum Coulee	28, 219, 36 22, 894, 16	4. 450547 4. 35972
Altona (Geodetic Survey of Canada)	49 97	07 30		9 50 98	28 16 13		189 229 278	26 58 01	38. 70 33. 75 57. 50	Neche Walhalla Plum Coulee	14, 299, 30 37, 451, 21 18, 193, 84	4. 155314 4. 573466 4. 259924
Pembina (Geodetic Survey of Canada)	48 97	57 17		99 137	52 48	27. 15 59. 61		41 39	18. 83 18. 03	NecheAltona	18, 279. 15 23, 255. 69	4. 26195 4. 366529
Letellier (Geodetic Survey of Canada)	49 97		07. 424 40. 155	3 53 90	$\frac{31}{32} \\ 02$	11. 68 40. 10 18. 68	183 233 269	30 20 51	32, 35 51, 66 57, 04	Pembina NecheAltona	17, 256, 80 23, 706, 13 16, 672, 53	4. 236960 4. 374860 4. 222001
Ridgeville (Geodetic Survey of Canada) .	49 96	04 58	26. 944 57. 736	61 103	40 03	21, 12 54, 36	241 282	26 50	19.75 31.37	Pembina Letellier	25, 753. 99 22, 115, 95	4. 410844 4. 344705
States (U. S. C. & G. S.)	49 97		01, 447 39, 343	71 140 232	25 12 11	41.72 59.46 59.68	251 320 52		14. 37 10. 93 33. 56	Pembina Letellier Ridgeville	12, 722, 57 17, 138, 11 13, 398, 05	4. 104575 4. 233962 4. 127041
Humboldt (Geodetic Survey of Canada)	48 97		51. 431 59. 493	135 177 201	69 16 12		315 357 21	01 15 18	20. 49 44. 06 24. 32	Pembina States Ridgeville	18, 251, 24 17, 010, 00 27, 031, 29	4. 261292 4. 230704 4. 431866
Canada (U. S. C. & G. S.)	49 96	00 53	00, 967 13, 184	44 90 139	49 08 36	28, 19 20, 68 51, 54	224 269 319	39 57 32	05, 29 26, 98 31, 36	Humboldt States Ridgeville	23, 898. 34 17, 605. 56 10, 792. 85	4. 378367 4. 245649 4. 033136
Tolstoi (Geodetic Survey of Canada)	49 96	04 48	25, 533 30, 513	90	15	43, 1	270	07	49. 2	Ridgeville	12, 730. 20	4. 10483
Stuartburn (Geodetic Survey of Canada).	49 96	04 42	24. 733 35. 875	90	14	02. 0	270	09	34. 0	Tolstoi	7, 197. 82	3. 85720
Vita (Geodetic Survey of Canada)	49 96	08 37	02. 525 50. 059	40	46	50. 7	220	43	14. 6	Stuartburn	8, 881. 31	3. 94847
Read (Geodetic Survey of Canada)	49 96		00.821	90	28	54. 4	270	24	42.6	Vita	6, 749. 57	3. 82927
Ingram (Geodetic Survey of Canada)	49 96	08 29	01. 032 30. 529	89	54	25. 3	269	52	19. 3	Read	3, 376, 94	3. 52852
Caliento (Geodetic Survey of Canada)	49 96		03. 180 39. 081	89	23	13. 9	269	19	33. 5	Ingram	5, 908. 49	3. 771476
Menisino (Geodetic Survey of Canada)	49 96		06. 889 24. 433	105	30	19.8	285	18	03. 0	Caliento	20, 503. 76	4, 31183

Station		ude and gitude	Δ	zim	uth	Bac	k az	imuth	To station	Distance (meters)	Logarithm
	0	, ,,	0	,	"	0	,	"			
Piney	49 (96 (4 43. 539 5 30. 460		33 56	56. 4 52. 9			44. 9 24. 6	Menisino	3, 603. 34 24, 099. 72	3, 556704 4, 38-012
Fast (Geodetic Survey of Canada)		4 28, 703 1 46, 960	95	47	35. 6	275	44	46. 7	Piney	4, 559. 01	3, 658870
McQuade (Geodetic Survey of Canada).		4 29. 578 8 32. 922	89	37	37. 2	269	35	10.6	Fast	3, 938. 24	3. 595301
Slow (Geodetic Survey of Canada)		3 34.010 4 41.916	110	07	51. 5	290	04	57. 0	McQuade	4, 993. 48	3. 698403
Guilbault (Geodetic Survey of Canada)		2 48.698 3 12.432	103 115 127	37		283 295 307	14 33 36		Piney_ McQuade Slow	15, 396, 67 7, 214, 20 2, 293, 60	4. 187426 3. 858188 3. 360517
South Junction (Geodetic Survey of Canada).		2 24. 616 5 45. 244	94	43	47. 7	274	38	10.0	Guilbault	9, 112. 11	3. 959618
Swamp (Geodetic Survey of Canada)		1 59, 995 4 11, 458	111	46	32. 0	291	45	21. 2	South Junction	2, 051. 13	3, 311993
Tod (Geodetic Survey of Canada)		2 13, 393 2 07, 079	80	42	31. 6	260	40	57. 7	Swamp	2, 560. 04	3, 408247
Soft (Geodetic Survey of Canada)		2 35.667 1 07.054	60	33	53. 8	240	33	08. 4	Tod	1, 399. 90	3. 146095
Sprague (Geodetic Survey of Canada)		2 08. 789 9 05. 579	108	36	47. 5	288	35	15.8	Soft	2, 603. 14	3. 415497
Rita (Geodetic Survey of Canada)		1 46, 898 4 23, 969	96	46	18. 7	276	42	46. 1	Sprague	5, 760. 13	3. 760432
Middleboro (Geodetic Survey of Canada)		1 07.731 6 24.160	97	07	32. 5	277	01	30. 3	Rita	9, 822. 73	3. 992232
Muskeg (Geodetic Survey of Canada)		0 51.877 3 06.647	96	58	42. 3	276	56	13. 2	Middleboro	4, 043. 12	3. 606716
Warroad north base=Boundary Monu- ment 909.		9 56. 463 2 30. 377	156	42	25. 1	336	41	57.7	Muskeg	1, 863. 79	3. 270396
Warroad south base		5 19.862 9 33.829	157	13	15. 71	337	11	02. 55	Warroad north base	9, 268. 657	3. 967016
Thunder		0 29.631 4 46.326		27 50	35. 65 54. 94	211 263	23 45	58. 78 04. 70	Warroad south base	11, 214, 62 9, 487, 18	4. 049784 3. 977137
West Willow		3 44.637 9 35.166	103 126 153	08	43. 55 34. 18 31. 40	283 305 333	58	12. 36 49. 59 36. 74	Warroad south base Warroad north base Thunder	12, 540, 58 19, 512, 59 14, 021, 39	4. 098317 4. 290314 4. 146791
Stoney		9 03, 604 7 56, 980	4 27 46		47. 04 41. 26 16. 55	184 207 226	34	32. 91 31. 95 16. 64	West Willow Thunder Warroad north base	28, 458, 46 17, 919, 50 24, 492, 88	4. 454211 4. 253325 4. 389039

GEOGRAPHIC POSITIONS OF TRIANGULATION STATIONS, LAND SURVEY CORNERS, AND FOREST SERVICE LOOKOUTS, GEORGIA STRAIT TO LAKE OF THE WOODS, SUPPLEMENTARY TO FIRST-ORDER SCHEME

Station			de and tude	A	zimı	ith	Back	c azi	muth	To station	Distance (meters)	Logarithm
Lake View			38, 302 29, 001		37 03 11	11. 8 15. 4 28. 9	0 191 245 109		29. 7 52. 4 26. 2	Remmel (U. S. C. & G. S.) Sheep Chopaka (U. S. C. & G. S.)	13, 673. 6 18, 364. 2 29, 036. 1	4. 135882 4. 263972 4. 462939
Snowy	49 119	02 52	57. 034 03. 900	59 88 328	54 32 50	55. 2 52. 1 02. 2	239 268 148	40 19 53	04. 5 42. 8 50. 8	Remmel (U. S. C. & G. S.) Lake View Chopaka (U. S. C. & G. S.)	27, 770. 5 21, 230. 9 11, 906. 2	4. 443584 4. 326969 4. 075773
Goat Peak Lookout	48 120	37 24	56. 297 10. 004	129 231 262	55 16 59	37. 4 54. 5 47. 9	309 51 83		55. 1 51. 5 02. 0	Robinson Chopaka (U. S. C. & G. S.) Tiffany (U. S. C. & G. S.)	16, 404. 3 58, 117. 2 34, 987. 3	4. 214958 4. 764305 4. 543910
Tower Mountain	48 120		19. 41 10. 03	211 260	42 42	08 47	31 81	47 17	56 31	Robinson	18, 063. 9 57, 577. 8	4. 256812 4. 760255
North Twenty Mile Lookout			06, 128 01, 507	153 222 312		54. 6 30. 2 55. 2	333 42 132	40 22 26	06. 2 18. 6 02. 4	Remmel (U. S. C. & G. S.) Chopaka (U. S. C. & G. S.) Tiffany (U. S. C. & G. S.)	21, 312. 0 30, 930. 9 13, 527. 6	4. 328624 4. 490393 4. 131222
Muckamuck Lookout			40. 080 19. 758	139 187 229	23 46 30	51. 3 49. 3 44. 4	319 7 49	20 50 41	26. 4 03. 9 17. 9	Tiffany (U. S. C. & G. S.)— Chopaka (U. S. C. & G. S.)— Lemanasky (U. S. C. & G. S.)	8, 581, 9 38, 882, 4 22, 661, 0	3. 933583 4. 589753 4. 355279
Bonaparte (U. S. G. S.)	48 119	47 07	07. 777 15. 714	127 213 257	46 26 29	34. 8 37. 1 13. 1	307 33 77	36 28 42	49. 6 31. 6 17. 0	Oroville Spur Bodie	20, 027. 3 5, 632. 9 21, 765. 2	4. 301622 3. 750734 4. 337762
Mon, 118			00. 737 39. 210	9 135 199	54 16 24	58. 3 17. 0 33. 1	189 315 19	54 14 26	22. 7 22. 7 02. 1	Osoyoos south base Osoyoos north base Anarchist	5, 577. 2 4, 372. 9 7, 196. 8	3. 746420 3. 640769 3. 857138
Mon, 117	49 119		00. 744 32. 066	269 346		35. 9 06. 1	90 166	01 20	01. 0 55. 6	Mon. 118Osoyoos south base	2, 293. 9 5, 654. 1	3, 360579 3, 752363
White	48 118		06. 026 00. 789	31 160 327		15. 1 38. 2 38. 9	211 340 147	44 57 23	33. 4 33. 0 10. 9	Bodie_ Greenwood Leona	20, 604. 7 10, 335. 5 28, 644. 0	4. 313966 4. 014330 4. 457033
Paris	49 118	01 37	28. 067 08. 653	47 123 339	06 42 17	01. 6 35. 5 48. 8	227 303 159	03 37 24	06. 4 34. 9 26. 0	White Greenwood Leona	6, 443. 0 9, 710. 1 30, 449. 9	3, 809091 3, 987225 4, 483586
Copper Butte (U. S. F. S.)	48 118	42 27	09. 314 52. 291	117 175 254		40. 4 51. 5 04. 7	297 355 74	06 19 45	06. 6 29. 6 19. 2	Bodie Leona O'Toole	30, 356. 8 7, 325. 2 44, 378. 8	4. 482256 3. 864821 4. 647176
Lake (U. S. C. & G. S.)	49 117		20, 035 43, 327	135 244	39 17	12. 4 38. 5	315 64	31 32	41. 7 08. 3	GloryKelly	17, 289, 4 25, 893, 2	4. 237781 4. 413185
Beaver (U. S. C. & G. S.)	49 117		50. 600 12. 351	70 96 171		45. 0 39. 5 09. 5	250 276 351	30 10 50	00. 2 23. 0 54. 4	Lake Glory Kelly	25, 191, 9 36, 049, 8 2, 852, 6	4, 401261 4, 556903 3, 455238
Creston	49 116	05 30	42. 414 52. 069	12 111	09 53	44. 3 06. 9	192 291	06 38	28.0 49.6	ParkerSummit	25, 162. 7 24, 742. 3	4. 400757 4. 393440
Boundary Monument No. 12, Montana-Idaho state line.	48 116		33. 476 52. 991	89 120 219	52 42 52	15. 4 41. 4 45. 8	269 300 39	27 07 55	54. 6 17. 8 49. 5	Parker Summit Ewing	39, 516, 3 66, 259, 0 7, 738, 7	4. 596776 4. 821245 3. 888666
Gateway south base	48 115		54. 450 09. 362	84 173 277 332	48 19 27 22	22. 6 55. 6 42. 8 25. 5	264 353 97 152	37 19 38 23	26. 9 12. 0 24. 3 10. 1	Yaak Frost Green Campbell	17, 777. 5 10, 095. 5 17, 444. 8 2, 595. 1	4. 249870 4. 004126 4. 241665 3. 414147
Rainbow Peak			43. 65 46. 82	224 268		20 06		$\frac{10}{23}$	14 41	CarterCrossley	2, 058. 0 23, 674. 2	3. 313444 4. 374275
Mt. Merritt	48 113	52 47	19. 34 08. 08	96 210	$\frac{03}{42}$	46 53	275 30	50 43	36 26	Carter Crossley	21, 475. 2 1, 703. 4	4. 331938 3. 231322
Galbreath	48 113		48, 360 32, 244	26 140 275	55 45 23	04.4 44.2 03.1	206 320 95	50 36 33	31. 4 27. 9 06. 6	Divide Beazer Mussetter	16, 339. 2 23, 637. 7 16, 371. 5	4. 213232 4. 373606 4. 214088
Stack	48 113	58 08	04, 533 10, 962	64 120 308	56 35 13	35. 1 34. 2 39. 3	244 300 128	51 20 18	02. 4 44. 5 10. 2	Galbreath Beazer Mussetter	9, 915. 2 27, 769. 7 9, 311. 4	3, 996303 4, 443571 3, 969018
G. L. O. No. 53 ecc	48 113	50 14	53, 821 06, 760	59 169	06 10	54. 7 26. 3	239 349	01 09	17. 5 21. 9	DivideGalbreath	10, 652. 0 9, 263. 8	4. 027430 3. 966788
G. L. O. No. 53	48 113	50 14	55. 55 06. 75	0	16	04	180	16	04	G. L. O. No. 53 ecc	53, 52	1, 72856
G. L. O. No. 52	48 113	54 02	52. 05 15. 67	204	12	37	24	12	40	Mussetter	196, 9	2. 29419
G, L, O, No. 51	48 112	59 51	54, 731 03, 723	45 269	22 53	03. 1 29. 9	225 89	20 57	47. 2 51. 7	RidgeBoundary east base	2, 873. 8 7, 051. 3	3, 458456 3, 848272

GEORGIA STRAIT TO LAKE OF THE WOODS, SUPPLEMENTARY TO FIRST-ORDER—Continued

Station			le and tude	A	zimı	ith	Back	azi	muth	To station	Distance (meters)	Logarithm
G. L. O. No. 50			51. 727 09. 632	o 122 164	, 10 34	50. 2 27. 0	302 344	, 03 32	36. 8 51. 1	Ridge Boundary east base	13, 806. 3 9, 719. 8	4. 140078 3. 987659
Bench	49	00	11. 858 05. 914	23 74 87	05 45 53	12. 9 10. 2 01. 3	203 254 267		04. 7 24. 3 21. 9	Boundary east base Ridge Boundary west base	565. 5 9, 660. 9 13, 999. 0	2. 752444 3. 985017 4. 146096
Track			42, 649 27, 764	64 181 228 310	26 55 19 39	38. 2 17. 5 19. 6 34. 1	244 1 48 130	14 55 25 50	32. 7 46. 9 23. 6 34. 9	Landslide Meeks Senior McCormick	21, 715. 1 23, 454. 7 13, 101. 0 23, 556. 3	4. 336761 4. 370230 4. 117304 4. 372107
Headlight Butte (U. S. G. S.)		47 18	22, 256 35, 092	119 189 240	03 06 13	59. 1 31. 6 34. 3	298 9 60	48 09 21	59. 4 39. 7 39. 0	Landslide Senior McCormick	27, 833. 8 31, 979. 8 15, 123. 2	4. 444572 4. 504876 4. 179645
3. L. O. No. 49 ecc			54. 191 41. 593	267 323	35 59	16. 4 29. 9	88 144	05 02	16. 7 23. 5	West Butte McCormick	48, 652, 5 7, 991, 1	4. 687105 3. 902604
F. L. O. No. 49		54 11	50. 63 32. 96	121	59	58	301	59	51	G. L. O. No. 49 ecc	207. 35	2. 31671
G. L. O. No. 48	48 112	51 08	21. 23 03. 86	247	38	34	67	38	44	McCormick	280. 74	2. 44831
Fennant	49 111		01. 830 24. 606	32 107 166		28. 4 32. 9 40. 5	212 287 346	50 40 35	21. 2 27. 1 20. 8	McCormick Senior Verdigris	21, 227. 2 20, 495. 0 16, 192. 1	4. 326892 4. 311648 4. 209303
Moberly			49. 270 45. 173	42 117 168		42.3	221 296 348	52 53 55	51. 1 06. 9 15. 4	McCormick Senior Tennant	18, 456. 8 22, 809. 2 4, 172. 7	4. 266157 4. 358110 3. 620415
3. L. O. No. 33	48 110		18. 06 57. 40		11		94	12	19	Joplin	895. 27	2. 951954
Sweetgrass	48 111		28. 013 19. 465	268 317		42. 5 46. 5	89 137	13 19	05. 8 53. 0	Goldstone	47, 702. 4 43, 463. 8	4. 678546 4. 638128
Chester	48 110	53 53	11. 013 54. 472	170 227		47. 6 14. 9	350 47	48 47	27. 3 36. 9	Pinhorn	13, 573. 8 11, 750. 3	4. 13270 4. 07005
7. L. O. No. 34			07. 36 10. 41	250	49	42	70	49	54	Chester	343. 67	2. 53613
Center VI	48 110	59 56	55. 172 03. 309	206 292 348	00	08. 2 34. 9 37. 3	26 112 168	27 07 09	25. 0 34. 4 14. 5	Pinhorn New Chester	1, 021. 9 12, 201. 7 12, 757. 3	3. 009400 4. 08642 4. 105758
Alma			46. 478 18. 991	99 177 249	57		279 357 69	36 56 47	52. 0 47. 9 57. 1	Hill New - Goldstone	27, 443. 0 16, 082. 7 22, 180. 8	4. 43843 4. 20635 4. 34597
Strode			58. 799 44. 523	227 291 359	39 37	55. 3 33. 1	47 111 179	55 49 06	32. 4 10. 9 39. 9	Sage_ Goldstone Joplin	34, 010. 3 20, 291. 4 40, 250. 6	4. 531610 4. 307313 4. 604773
7. L. O. No. 35	48 110	57 44	01. 63 28. 19		15		255	15	09	Strode	343, 58	2. 53603
G. L. O. No. 36	48 110		50. 905 37. 461	80 291			260 111	09 45	02. 7 44. 7	HillGoldstone	39, 424. 5 9, 619. 6	4. 59576 3. 98315
F. L. O. No. 37		53			07		186			Goldstone	344. 07	2. 53665
3. L. O. No. 38	48 110	44	25. 237	148 242		54. 3 59. 3	328 62	26 55	57. 9 39. 5	Goldstone Simpson	18, 493. 2 34, 154. 3	4. 26701 4. 53344
G. L. O. No. 39 ecc	48 110	54 05	57. 934 23. 386	45 82 290	12 47		225 262 110	29	07. 7 19. 2 48. 2	G. L. O. No. 38_ Goldstone_ Simpson	27, 689. 6 29, 475. 8 11, 422. 5	4. 44231 4. 46946 4. 05776
3, L. O. No. 39	48 110	54 03	27. 73 25. 92	111 289	19	24	291 109		55 16	G. L. O. No. 39 ecc Simpson	2, 567. 4 8, 856. 0	3. 40948 3. 94723
G. L. O. No. 40	100	52	43. 78 32. 06		51		337			Simpson	244. 58	2. 38841
Havre	48	56	46, 357 02, 685	136 202 302	04	08. 4 37. 2 12. 7	316 22 122		31. 8 44. 4 19. 3	Sage Govanlock Simpson	31, 962, 6 21, 949, 6 13, 626, 1	4. 50464 4. 34142 4. 13437
Thibedeau (U. S. G. S.)			24. 24 19. 37	283			103			Havre south base		0. 77452
3, L. O. No. 41	1	56	56. 60 51. 87	326	39	39	146	39	44	Havre north base	248. 33	2, 39503
G. L. O. No. 42	48	54	50. 350 17. 461	9 100	01 59		188 280	59 48	58. 1 33. 4	Havre south baseSignal	15, 830. 8 18, 252. 6	4. 19950- 4. 26132
Forks (U. S. G. S.)			09. 958 26. 775	73 194 258	36	42. 9 25. 8 19. 8	253 14 78	08 42 21	16. 7 41. 1 31. 2	Havre south baseOld Man Cherry	17, 741, 4 39, 945, 7 30, 187, 6	4. 248989 4. 601470 4. 479828

GEORGIA STRAIT TO LAKE OF THE WOODS, SUPPLEMENTARY TO FIRST-ORDER—Continued

Station	La	tituo	de and tude	A	zim	ith	Back	k azi	muth	To station	Distance (meters)	Logarithm
West Cherry (U. S. G. S.)	48 108	52 57	35, 306 44, 012	9 197 249 287		15. 6 56. 3 26. 7	69 107	21 30	55. 9 39. 4 46. 8	Lucky Alkali Cherry	25, 357. 2 28, 947. 8 569. 5	4. 404102 4. 461616 2. 755530
G. L. O. No. 43 ecc.	48 109	54 09	48.746 36.513	171 285	17 50	43.3 52.8	351 106	15 00	02. 5 09. 8	Old Man Cherry	28, 510. 1 15, 656. 1	4. 454999 4. 194684
G. L. O. No. 43	48 109	54 09	50. 66 32, 90	51	08	56	231	08	54	G. L. O. No. 43 ecc	94.35	1, 97474
G. L. O. No. 44	48 168	59 45	57.366	45 146	30 25	44.3 58.7	225 326	22 21	04. 0 38. 0	Cherry Lucky	19, 709. 8 12, 667. 7	4. 294683 4. 102698
Tubs			43. 932 59. 405	59 170 254	26 24 59	28. 3 12. 2 33. 7	239 350 75	20 22 09	13. 0 16. 6 41. 6	Cherry Lucky Alkali	11, 784. 2 18, 641. 5 16, 976. 0	4. 071301 4. 270481 4. 229836
S-313	48 108	59 57	32. 081 56. 321	214 302 356	28 46 31	35. 1 38. 0 16. 2	34 122 176	33 53 31	24. 9 22. 9 45. 5	Lucky Tubs Cherry	13, 753. 0 12, 998. 5 13, 072. 5	4. 138397 4. 113895 4. 116357
Rounds	49 108	03 48	18, 585 53, 821	27 143 300	07 23 39	07. 7 29. 6 02. 3	207 323 120	00 21 49	47. 8 29. 7 06. 6	Cherry Lucky Alkali	22, 510, 8 5, 401, 3 18, 927, 8	4. 352392 3. 732495 4. 277101
G. L. O. No. 1	48 108	53 57	13. 63 23. 97	355	12	55. 6	175	12	59.8	Cherry_	1, 362. 2	3. 134240
D. L. S. No. 1	49 108	19 53	11. 37 51. 33	295	10	52.8	115	11	11.8	Claydon	558. 3	2. 7468670
D. L. S. No. 2	49 108	05	12.37 17.34	159	19	31.1	339	19	19. 5	Lucky	876.1	2. 942553
Divide	49 109	10	22, 276 07, 519	238 286 326	23 49 37	42. 6 23. 6 00. 2	58 107 146	40 07 50	08.3 13.7 28.1	Claydon Lucky Cherry	30, 856, 26 29, 989, 26 39, 630, 24	4. 489343; 4. 476965; 4. 598026;
D. L. S. No. 3	49 109	10 15	27. 21 20. 54	300	01	22. 5	120	01	32.4	Divide	304.71	2. 483886
Wylie	49 109	09	54. 14 21. 23	228 289	35 53	12. 5 10. 5	48 110	47 06	15. 8 38. 6	Claydon Lucky	25, 715, 93 23, 055, 12	4. 410202 4. 362767
D. L. S. No. 4	49 109	10 08	27. 37 39. 63	39	22	53. 2			21.7	Wylie	1, 328. 10	3. 123230
G. L. O. No. 2	48 108	58 35	18, 43	43	07	33. 1	223	07	19. 2	Alkali	549.3	2. 739809
D. L. S. No. 5	49 108		04. 75	209	50	01.0	29	50	01.7	Rapdan	35. 28	1. 547528
D. L. S. No. 6	49 108		39. 48 34. 96	210	45	43.0	30	45	47.0	Center	210. 43	2. 323107
D. L. S. No. 7	49 108		12. 24	279	27	04.3	99	27	24.1	Climax	536. 15	2. 729286
G. L. O. No. 3	48 108	57 20	25. 72	258	48	38. 3	78	49	00.8	Big Butte	619. 0	2. 791690
D. L. S. No. 8	49 168	10		356	02	14.1	176	02	14.8	Edmund	286. 51	2. 4571398
G. L. O. No. 4	48 108	55	40. 28 15. 53	159	22	22.0	339	22	18.0	Porter	307. 29	2. 487548
D. L. S. No. 9	49	00	25. 42 32. 63	194	17	29.9	14	17	35. 0	Monchy	558. 35	2. 746906
Center XV		00	00. 742 06. 328	128 163 204		53. 9 43. 0 28. 2	343	02	53. 9 48. 3 32. 6	Monchy Roche 70 Mile Butte	2, 076. 2 21, 653. 0 23, 896. 7	3. 317275 4. 335517 4. 378338
G. L. O. No. 5	48 107	59 34	33, 41 32, 47	236	04	20.0			37. 2	Whitewater	558, 5	2. 7470233
T. S. B. M. No. 31 1	49 107	00	02. 43 30. 85	94 281	59 30	46. 2 28. 6	274 101	50 32	46. 6 15. 2	Monchy Whitewater	14, 585. 0 2, 928. 6	4. 1639078 3. 4666669
G. L. O. No. 6	48 107	57	22. 06 41. 13	109		13.7	100000		06. 5	Long	207. 0	2. 3159703
D. L. S. No. 10		17	27.72 00.88	299	39	16. 1	119	39	21. 5	Wideview	165. 2	2. 2180100
D. L. S. No. 11	49	08	17. 34 49. 58	136	59	27.8	316	59	23.0	Blum	186. 2	2, 2699797
D. L. S. No. 12	49	10	28. 40 07. 99	210	00	07.1	30	00	16.7	Peaked Butte	512. 89	2. 7100242
G. L. O. No. 7	48	52	48. 17 59. 41	248	59	37.8	69	00	21.8	Thoeny	1, 274, 60	3. 1053739

¹ No check on this position.

GEORGIA STRAIT TO LAKE OF THE WOODS, SUPPLEMENTARY TO FIRST-ORDER—Continued

Station		itude and ngitude	A	zim	uth	Bac	k az	imuth	To station	Distance (meters)	Logarithm
D. L. S. No. 13		, ,, 10 28.07 36 26.39	100	07	18.4		0,7	10.0	Clay Butte	246, 71	2, 3921868
G. L. O. No. 8	48	54 44.27 31 09.49	122	01	55. 0	302	01	25. 4	Roanwood	944. 68	2. 9752847
G. L. O. No. 9	48	52 54.46 18 13.17	144	36	49.7	324	36	31.0	Glentana	871.74	2, 9403870
D. L. S. No. 14	49	06 59.32 16 25.29	140	16	36.7	320	16	28.9	Table Butte	328. 47	2, 5164957
D. L. S. No. 15	49	10 54.44 03 00.62	67	40	52.6	247	40	42. 2	Quantock	301, 84	2. 4797768
G. L. O. No. 10	48	54 38.74 01 14.09	161	14	08.1	341	13	57.6	Richland	874. 93	2. 9419733
G. L. O. No. 11		50 17.97 52 45.03	129	10	46. 4	309	10	27.5	Templeman	657.07	2. 8176116
D. L. S. No. 16	49	08 43.11 47 22.72	103	04	10. 2	283	03	56.8	Fife Lake	368. 32	2. 5662253
D. L. S. No. 17	49	01 17.63 35 21.87	246	43	01.7	66	43	10.6	Poplar (G. S. of C.)	260. 87	2. 4164241
D. L. S. No. 18	49	06 57.34 21 20.10	356	42	22.6	176	42	22.9	Eddyside	138. 03	2. 1399735
G. L. O. No. 12	48	57 14.94 13 19.47	344	29	43.0	164	29	46. 6	Whitetail	354. 84	2. 5500326
G. L. O. No. 13	48	45 57.48 06 51.25	161	35	26. 7	341	35	25. 3	Flaxville	120, 56	2. 0812032
Madoc school	48	48 35.72 17 13.52	83 197 290	57 11 35	51. 1 25. 1 22. 9	263 17 110	56 14 43	25.0	Madoc_ Whitetail Flaxville	2, 292, 40 16, 433, 54 13, 533, 85	3. 3602899 4. 2157312 4. 1314215
D. L. S. No. 19.		02 08.65 01 58.66	64		21.3	1		59.7	Mervin (G. S. of C.)	642, 26	2. 8077109
Flaxville church	48	48 18.61 10 31.92	168 201 313	12	23. 9 16. 3 18. 3	348 21 133	25 18 34	21. 2 21. 6 02. 9	Whitetail Mervin (G. S. of C.) Flaxville	16, 561. 86 27, 218. 34 6, 162. 22	4. 2191091 4. 4348616 3. 7897370
Fire		58 56, 830 04 56, 906	5 71 208		21. 9 25. 6 15. 0	185 250 28	37 56 18	54. 4 10. 0 08. 0	Flaxville Whitetail Mervin (G. S. of C.)	24, 077. 3 10, 711. 5 6, 417. 9	4. 381607 4. 029851 3. 807393
G. L. O. No. 14		59 57.13 45 16.67	57	19	46. 3	237	19	33.4	Ross	410.39	2, 6131968
G. L. O. No. 15		43 20.44 44 36.27	303	35	09.6	123	35	31.2	Plentywood	704.68	2, 8479920
G. L. O. No. 16		56 22.48 33 06.87	212	13	22.7	32	13	36. 7	Bruce	707. 97	2.8500149
Dooley school 1		52 40.48 23 21,52	122 347	55 08	30. 8 23. 6	302 167	48 08	23. 6 38. 8	Bruce Dooley	13, 740, 52 1, 849, 57	4. 1380031 3. 2670712
D. L. S. No. 20		04 20, 68 20 35, 05	55	39	18. 4	235	39	15. 4	Tangedal	96.95	1, 9865478
D. L. S. No. 21	49 104	04 23. 28 01 54. 93	75	26	39. 2	255	26	26, 7	Trees	345. 03	2. 5378569
D. L. S. No. 22		01 43.18 50 33.82	22	26	38. 3	202	26	31. 9	Agate	451.78	2. 6549270
Oslo church	48 103	58 00. 59 58 06. 78	113 157 234	$\frac{11}{04}$ $\frac{26}{26}$	07. 5 22. 4 06. 2	292 337 54	54 01 31	06. 7 17. 8 41. 6	Tangedal	29, 857, 10 12, 744, 37 11, 100, 61	4. 4750476 4. 1053183 4. 0453469
Pleasant Valley church 1		58 07, 28 08 04, 86	211 253	53 28	02, 5 40, 4	31 73	57 41	29. 4 47. 2	TreesAgate	13, 582, 78 22, 092, 74	4. 1329887 4. 3442495
Cut		59 26, 205 13 12, 540	134 235 298	57 50 34	42. 7 17. 1 59. 1	314 55 118	52 58 49	05. 6 36. 3 41. 4	TangedalTreesAlkabo	12, 806. 6 16, 217. 5 27, 465. 6	4. 107433 4. 209985 4. 438789
High		00 36, 380 15 41, 488	138 305	43 35	02. 5 19. 0	318 125	39 37	17. 8 11. 4	TangedalCut.	9, 152, 3 3, 723, 6	3. 961532 3. 570964
Norge school 1		01 45. 02 02 55. 33	190 271	31 47	18. 8 04. 1	10 91	31 56	52. 0 17. 6	TreesAgate	4, 884, 56 14, 899, 33	3. 6888251 4. 1731666
Summit school 1		05 13, 32 57 05, 74	75 311	17 35	15. 2 18. 0	255 131	13 40	24. 3 07. 6	TreesAgate	6, 413, 92 10, 415, 04	3. 8071232 4. 0176609
G. L. O. No. 17		53 41.39 47 36.96	287	29	13. 1	107	29	25. 0	Norge	337. 00	2, 5276299

¹ No check on this position.

Station	La 1	titu ongi	de and tude	A	zim	uth	Bac	ek az	imuth	To station	Distance (meters)	Logarithm
Church No. 1 ¹		47	33. 46	205	18	10.6		00	"		00 500 00	
	104	00	43. 79	235		49. 6 33. 2	- 25 55			Agate Norge	28, 579. 28 19, 867. 20	4. 4560512 4. 2981366
Alkabo school 1	48 103		57. 90 11. 22	151 246	10 30		331 66		59. 9 27. 9	Alkabo Norge	750. 20 7, 774. 99	2. 8751792 3. 8906999
G. L. O. No. 18	48 103		01. 92 17. 24	352	31	16. 5	172	31	17.8	Pole	268. 90	2. 4295908
Fortuna school	48 103		28. 89 22. 77	37 65 181	10 16 20	14.8	217 245 1	10	07. 6 53. 7 24. 9	Norge_ Alkabo_ Pole_	1, 968, 57 9, 562, 16 6, 315, 91	3. 2941499 3. 9805561 3. 8004361
D. L. S. No. 23	49 103	01 39	41. 84 50. 62	185	38	34. 8	5	38	36. 2	Messers	382, 51	2. 5826428
Colgan school	48 103	57 37	02. 65 11. 22	63 98 160	05 05 26	43. 2 54. 1 13. 6	242 277 340	59	03. 4 03. 6 14. 7	Norge_ Pole Messers	13, 932, 46 11, 182, 81 9, 558, 00	4. 1440277 4. 0485510 3. 9803671
Twin Butte church	48 103		50. 10 44. 01	97 110 218	20 08 45	09. 3 26. 4 15. 0	277 289 38	59	47. 3 41. 3 53. 1	Alkabo_ Norge_ Ambrose	21, 881, 05 15, 125, 64 9, 416, 05	4. 3400682 4. 1797137 3. 9738689
D. L. S. No. 24	49 103	03 29	26. 95 10. 91	33	28	46. 3	213	28	44.8	Schnell	69. 55	1. 8422971
Bromhead church	49 103	10 40	48. 32 36. 60	314 338 356	34 13 37	05. 8 14. 4 49. 9	134 158 176	20	42. 8 34. 0 26. 1	Schnell Ambrose Messers	19, 487, 30 31, 942, 54 16, 529, 69	4, 2897516 4, 5043694 4, 2182647
Lake Qu'Appelle church	49 103	14 33	53. 49 09. 09	18 347 355	38 17 47	23. 6 13. 4 35. 7	198 167 175	33 20 49	21. 3 12. 1 17. 4	Messers Schnell Ambrose	25, 401, 73 21, 799, 22 37, 349, 13	4. 4048633 4. 3384410 4. 5722805
Church No. 2	49 103	03 32	28. 57 26. 85	72 271 353	02 33 20	35. 2 09. 0 12. 2	251 91 173	57 35 21	01. 4 35. 5 21. 8	Messers Schnell Ambrose	9, 436, 54 3, 941, 14 16, 199, 59	3. 9748129 3. 5956214 4. 2095039
G. L. O. No. 19	48 103		16. 44 15. 44	99	08	55, 8	279	08	54. 9	Hansen	24. 70	1. 3920970
Church No. 3.	48 103		46. 33 26. 75	140 141 210	15	25. 0 27. 7 51. 1		34 13 49	50. 6 36. 3 14. 4	Messers Ambrose Hansen	21, 884, 05 4, 808, 01 7, 560, 63	4. 3401278 3. 6819650 3. 8785577
Ambrose school	48 103		11. 99 36. 00	32 122 292	19 34 51	53. 2 52. 1 45. 9	212 302 112		08. 8 24. 4 16. 3	Ambrose_ Messers_ Hansen_	5, 274. 15 16, 218. 46 4, 403. 27	3. 7221524 4. 2100095 3. 6437756
D. L. S. No. 25	49 103		56. 90 09. 83	333	02	51. 5	153	03	01.6	Gardner	597. 53	2. 7763571
Torquay elevator	49 103	08 29	32. 76 14. 95	46 281 359	15	41. 9 38. 4 13. 9	226 101 179		43. 0 28. 0 15. 6	Messers Gardner Schnell	17, 805, 01 17, 752, 35 9, 505, 24	4. 2505423 4. 2492559 3. 9779631
Crosby courthouse	48 103	54 17	55. 63 38. 29	105 188 248	02 34 24	58. 0 49. 0 25. 8	284 8 68	57 36 26	12. 4 51. 1 40. 8	Hansen Gardner Peterson	9, 659. 28 21, 995. 93 3, 921. 18	3. 9849448 4. 3423424 3. 5934167
D. L. S. No. 26	49 102		01. 64 45. 67	151	52	31. 5	331	52	21.3	Estevan	584. 73	2. 7669554
G. L. O. No. 20	48 102		45. 05 44. 43	108	56	21.5	288	56	01.6	Cook	571. 52	2. 7570314
Estevan water tank	49 102	08 59	21. 80 35. 33	80 289 349	30 16 05	25. 0 44. 9 06. 9	260 109 169	18 20 09	48. 5 13. 7 11. 7	Gardner Estevan Cook	18, 941, 08 5, 930, 18 34, 940, 78	4. 2774047 3. 7730678 4. 5433326
G. L. O. No. 21	48 102	58 45	26. 57 50. 59	255	07	29. 7	75	07	46. 4	Short Creek	465. 89	2. 6682834
Larson church 1	48 102	53 51	26. 97 28. 15	26 217	27 57	58, 2 04, 2	206 38	25 01	55. 6 35. 4	Cook Short Creek	7, 449. 38 11, 894. 71	3. 8721201 4. 0753537
D. L. S. No. 27	49 102	02	09. 83 40. 32	235	08	23. 6			48. 2	Dunbar	804. 38	2. 9054613
Estevan school	49 102	08	08. 78 10. 79	81 286 294	55 58 30	41. 6 10. 1 11. 3	261 107 114	43 01 44	46. 6 20. 3 35. 1	Gardner Estevan Dunbar	19, 371, 38 5, 332, 11 25, 510, 92	4. 2871605 3. 7268994 4. 4067261
Bienfait school.	49 102		33. 06 13. 38	11 74 319	52 22 03	58. 7 12. 8 51. 0	191 254 139	48 17 09	28. 9 05. 8 58. 0	Cook Estevan Dunbar	35, 414, 55 8, 545, 92 15, 051, 14	4. 5491817 3. 9317586 4. 1775694
Columbus church	48 102		22. 40 50. 03	47 192 208	$02 \\ 12 \\ 43$	13. 3 59. 3 27. 7	226 12 28	56 14 48	41. 2 00. 8 31. 1	Cook Short Creek Dunbar	12, 288, 12 7, 840, 15 16, 997, 04	4. 0894855 3. 8943245 4. 2303733

¹ No check on this position.

Station			le and tude	A	zimu	ith	Back	azi	muth	To station	Distance (meters)	Logarithm
	0	,	"	0	,	"	0	,	"		Private Co	THE PARTY
Briquet plant, water tank	49	06	04. 31 15. 11	22 99 323	00 59 28	59, 6 46, 4 32, 6	201 279 143	51	30. 2 39. 5 39. 4	Cook Estevan Dunbar	32, 415. 74 13, 262. 55 8, 438. 83	4. 5107559 4. 1226269 3. 9262824
D. L. S. No. 28.	- 48 102	59 33	57. 18 16. 10	275	01	30.6	95	01	43. 1	Portal	339. 27	2, 5305458
F. L. O. No. 22		52	20. 84 44. 40	163	29	30. 6	343	29	25. 3	Lignite	506. 25	2. 7043650
Lignite church	48 102		34. 36 40. 27	156 183 266	39 28 05	39. 7 34. 6 19. 0	336 3 86	34 29 05	47. 4 05. 4 55. 8	Dunbar Portal Lignite	19, 868. 07 13, 674. 71 996. 78	4. 298155 4. 135918 2. 998598
Portal chimney	- 48 102		48, 04 47, 05	0 54 118	23 56 25	12. 6 00. 7 58. 1	180 234 298	23 39 20	09. 3 53. 0 25. 4	LigniteCookDunbar	13, 329, 48 31, 991, 77 10, 179, 99	4, 124813 4, 505038 4, 007747
F. L. O. No. 23	- 48 102		05. 14 37. 22			48. 2			51. 2	Flaxton	108. 75	2. 036429
laxton school 1	1 1957	53	47. 31 16. 92	79 262	28 10	57. 7 14. 1	259 82	21 13	44. 8 02. 6	LigniteFlaxton	11, 907. 12 4, 597. 19	4. 075806 3. 662492
). L. S. No. 29	1	01	16.00		56		-		48, 4	Spy	1, 250. 26	3. 097000
robisher elevator		12	24. 88 31. 82	21 43 334	28 51 14	57. 9 47. 1 33. 8	201 223 154	40	19. 5 44. 7 38. 9	Portal Dunbar Spy	24, 846, 39 25, 675, 26 22, 575, 14	4. 395263 4. 409514 4. 353630
Church No. 4	- 48 102		21, 36 54, 72	120 200 323	20	49. 1 14. 2 38. 1	299 20 143	22	42. 5 49. 4 39. 4	Portal Spy Flaxton	17, 013. 08 12, 028. 84 2, 819. 91	4. 230782 4. 080223 3. 450235
lameda school 1	- 49 102		51, 29 03, 59	1 33		16. 4 48. 4	181 213		57. 2 45, 5	Spy Portal	26, 722, 61 35, 299, 13	4, 426878 4, 547764
O. L. S. No. 30	- 49 102		35, 32 03, 51	330	14	51. 4	150	15	01.9	Martin	568. 65	2, 75484
Perella elevator			08. 42 01. 55	89 167 219	31	39. 4 17. 9 39. 2	269 347 39	41 29 26	14. 7 26. 7 20. 8	Flaxton Spy Martin	5, 534, 28 13, 859, 12 19, 618, 32	3. 743061 4. 141735 4. 292661
Church No. 5			02, 99 23, 49	117 155 197	01 50 58	32. 1 07. 9 41. 4	296 335 18	44	38. 0 47. 1 53. 2	Flaxton Spy Martin	12, 569, 93	4, 099332 4, 324606 4, 341827
xbow Church 1	49 102		48. 75 21, 20	20 342	45 26	37. 6 57. 0	200 162	40 31	14. 2 07. 7	SpyMartin		4. 389468 4. 348952
J. L. O. No. 24	48 102		30. 11 55. 16	101	38	16. 2	281	38	05.8	McGillivray	286, 40	2, 45697
Elcott elevator		02	44. 07 50. 49	7 74 308		29. 7 42. 0 53. 8	187 254 128	27 13 32	12. 2 15. 8 44. 2	Flaxton Portal McGillivray	16, 093, 25 19, 182, 04 24, 447, 65	4, 206643 4, 282894 4, 388237
Bowbells water tank	- 48 102		15. 08 33. 10	109 150 232		47. 6 30. 1 53. 8	289 330 52	43 37 34	00, 6 44, 1 14, 2	Lignite Flaxton McGillivray	23, 808, 69 12, 489, 46 19, 122, 53	4, 376735 4, 096543 4, 281545
L. O. No. 25	- 48 101	55 52	47. 52 05. 75	321	04	38. 0	141	04	57.8	Bluel	851, 80	2, 930337
Church No. 6 1			10. 62 04. 40			24. 2 40. 2			19. 2 29. 4	McGillivrayBluel		4, 105663 4, 007836
'olley elevator 1	- 48 101		40. 50 46. 71	143 173		14. 1 17. 7	322 353	57 57	55. 5 52. 8	McGillivrayBluel	25, 184, 56 21, 916, 37	4, 401134 4, 340768
O, L. S. No. 31	- 49 101		56. 42 55. 55	54	51	49.8	234	51	46, 6	Goertz	105, 08	2, 021520
, L. O. No. 26	48 101		11. 18 57. 96	274	15	01. 9	94	15	16. 4	Trout	391, 48	2, 592709
Morse west base school	- 48 101			28 177 235	05	52. 1 55. 8 15. 1	208 357 55	05	16. 3 35. 1 07. 7	Bluel Goertz Harris	5, 390, 40 10, 989, 54 17, 434, 93	3. 731620 4. 040979 4. 241420
Sherwood church	- 48 101			76 127 179	04 27	42. 1 25. 4 10. 1	255 307 359		10. 6 08. 5 06. 6	Bluel Goertz Harris	17, 563, 34 18, 865, 75 10, 396, 64	4. 244607 4. 275674 4. 016892
Carievale elevator 1	49		38. 09 37. 90	0 50	45	49.6	1	45	42.9	HarrisGoertz	13, 527, 29 19, 538, 78	4, 131210 4, 290897
O. L. S. No. 32	49	02	38. 59			29, 4			24, 4	Gainsborough	173, 70	2, 239799

¹No check on this position.

Station			de and tude	A	zim	uth	Bac	k az	imuth	To station	Distance (meters)	Logarithm
G. L. O. No. 27	6 48 101	53 24	36. 54 32, 48	。 307		25. 9	° 127	51	32, 2	Mohall	214. 80	2, 3320383
Mohall water tank			51, 63 37, 16	144 193 208	06 23 05	18. 5 55. 0 29. 6	324 13 28	00 28 10	16. 0 31. 0 10. 4	TroutGainsboroughMohall	16, 735, 83 32, 092, 42 16, 135, 67	4, 2236473 4, 5064025 4, 2077869
D. L. S. No. 33	49 101		58. 05 37. 41	66	25	26. 9	246	24	43.7	Lyleton	1, 268, 15	3, 1031706
Lyleton school 1	49 101	03 10	27. 52 47. 32	85 210		19. 8 00. 1	265 30	06 31	57. 6 09. 7	Gainsborough Lyleton	16, 783, 22 505, 99	4, 2248754 2, 7041400
G. L. O. No. 28	48 101		02. 51 27. 80	177	38	52. 6	357	38	51.8	Westhope	522, 06	2. 7177204
Antler church	48 101	58 16	18. 99 49. 42		18 57 54	21.4	226 310 123	$\frac{12}{51}$ 02	48. 6 33. 0 01. 9	Mohall	12, 810. 70 12, 411. 14 13, 598. 82	4. 1075727 4. 0938115 4. 1335013
Kuroki elevator 1	48 101	55 08	55. 23 39. 30	77 334		15. 8 35. 8	256 154	58 09	23. 6 28. 9	Mohall	19, 739, 31 3, 289, 88	4. 2953320 3. 5171804
Church No. 7 ¹	48 101	52 17	19. 24 59. 71	106 253		30. 4 30. 8	286 73	01 57	40. 8 26. 1	Mohall Westhope	8, 151, 15 13, 376, 78	3. 9112187 4. 1263517
D. L. S. No. 34	49 100	03 58	57. 93 52. 01	271	11	29. 2	91	12	06. 2	Hayden	993. 78	2, 9972881
Cameron elevator			51. 43 35. 97	10 73 281	13 32 48	19. 5 24. 7 32. 4	190 253 101	11 27 53	09. 0 53. 7 29. 3	Westhope Lyleton Hayden	19, 838, 36 7, 592, 90 8, 148, 24	4, 2975057 3, 8804077 3, 9110638
G. L. O. No. 29	48 100		14, 31 22, 87	355	45	19. 9	175	45	20, 9	Malme	384, 07	2, 5844104
Coulter water tank			03. 61 27. 42	78 304 336	27 57 00	10. 6 29. 4 00. 1	258 124 156	59	31. 8 18. 5 36. 3	Lyleton Hayden Malme	12, 582, 27 3, 575, 46 18, 312, 14	4, 0997591 3, 5533314 4, 2627392
Coulter church			20, 42 01, 79	77 335 341		41.2 09.6 55.2	257 155 161	$\frac{40}{06}$ $\frac{45}{45}$	57. 7 54. 0 26. 8	Lyleton Hayden Malme	14, 389, 35 2, 831, 94 18, 169, 50	4. 1580413 3. 4520836 4. 2593430
Landa church			41. 94 43. 26	167 185 239	51	22, 7 24, 6 08, 6	347 5 59	51	51. 9 41. 0 51. 5	Hayden Malme Souris	19, 437, 67 4, 346, 53 12, 588, 15	4. 2886442 3. 6381422 4. 0999620
Church No. 8 1		56 33	39. 21 20. 68	87 93	33 17	38. 7 27. 9	267 273	17 08	48. 0 03. 7	Malme Souris	25, 684, 16 15, 245, 88	4. 4096653 4. 1831526
Carbury school 1			30. 70 36. 18	100 112		16. 0 53. 3	279 292	49 23	52. 2 55. 8	MalmeSouris	26, 985, 15 17, 462, 99	4. 4311249 4. 2421186
Church No. 9			59, 40 19, 98	59 206 290	33	10. 1 37. 0 13. 7	239 26 110	37	22, 8 30, 8 53, 0	Malme Temple Souris	7, 127, 54 14, 052, 84 4, 592, 63	3, 8529396 4, 1477641 3, 6620616
Waskada ehureh			50, 25 55, 75	23 293 350	22 22 55	04. 2 42. 4 19. 0	203 113 170	25	13, 0 32, 8 54, 9	Malme Temple Souris	19, 792, 94 4, 983, 37 16, 372, 81	4. 2965103 3. 6975233 4. 2141233
Seandia school			03. 56 47. 28	76 197 267		03. 9 08. 9 50. 0	256 17 87	09	06. 7 52. 7 19. 4	Malme Temple Souris	8, 244, 65 14, 955, 42 2, 413, 05	3. 9161721 4. 1747987 3. 3825663
Souris school	48 100	54 40	43, 66 54, 97	126 167 245	58	21. 6 30. 9 11. 9	306 347 65		40. 1 03. 5 11. 6	Souris Temple Johnson	7, 438, 56 19, 031, 83 15, 995, 68	3. 8714887 4. 2794805 4. 2040027
Mouse River church 1			25, 00 44, 98	167 236	17 30	04. 6 22. 8	347 56		06. 7 31. 8	Malme Johnson	14, 470. 01 33, 306. 09	4. 1604687 4. 5225237
Kramer church 1	48 100	41 42	29. 03 12. 30	199 207	$\frac{02}{20}$	50. 9 56. 1			03, 6 53, 0	Declercq Johnson	45, 621. 64 35, 107. 34	4. 6591709 4. 5453979
Minto church 1	49 100	24 01	35. 72 30. 34	16 357	47 26	01. 8 57. 2	196 177		53. 2 07. 2	Scott Ninga H	39, 780. 56 42, 193, 74	4. 5996709 4. 6252480
Fairfax church	49 100	26 07	08, 12 36, 02	296	36	04. 1 59. 4 55. 7		47	32, 4 49, 3 42, 7	Scott Margaret Ninga H	41, 152, 18 19, 319, 59 45, 951, 23	4. 6143929 4. 2859979 4. 6622972
Rhodes water tank	49 99	12 47	04, 60 37, 00	38 62 158	26	26. 4 41. 1 42. 5		09	06, 3 02, 9 22, 4	Ninga H Scott Margaret	24, 181, 49 32, 036, 72 18, 709, 46	4. 3834830 4. 5056480 4. 2720613
Minto school 1	49 100	24 01	26. 07 28. 15	299 357		33, 1 30. 8	119 177		43. 5 39. 1	MargaretNinga H	11, 290, 55 41, 894, 06	4. 0527150 4. 6221524
D. L. S. No. 35			01. 51 20. 95	64	27	03. 2	244	26	52. 7	Ram	310. 49	2. 4920476

¹ No check on this position.

Station			le and cude	A	zimı	uth	Back	azi	muth	To station	Distance (meters)	Logarithm
Boissevain church	49	, 13 03	49, 38 07, 99	27 283 350	40 48	36, 1 22, 4 32, 6	207 103 170	34 57	41. 9 07. 2 56. 4	Scott Ram Ninga H	20, 463, 59 14, 451, 36 22, 516, 92	4. 3109818 4. 1599086 4. 3525090
Ninga church			41, 43 16, 35	20 179 327	24 41 26	00. 1 49. 1 27. 7	200 359 147	41	56, 4 46, 2 44, 6	Ninga H Margaret Ram	23, 400, 64 14, 385, 34 3, 820, 92	4. 3692277 4. 1579201 3. 5821683
D. L. S. No. 36	49 99	01 29	17. 40 37. 95	85	58	56. 9	265	58	37. 4	Lena	523. 70	2. 7190826
Margaret elevator			22, 27 29, 23	22	16 27 57	47. 4 53. 1 26. 9		26	43. 2 28. 9 37. 4	Ram Margaret Fairhall	23, 018. 80 5, 856, 56 19, 718. 76	4. 3620827 3. 7676426 4. 2948795
Killarney church			59. 86 53. 71	55 97		13. 2 01. 9	235 277 3	02	02. 9 11. 3 35. 1	Ninga H Ram Fairhall	29, 727, 94 14, 305, 57 11, 602, 11	4. 4731648 4. 1555053 4. 0645369
D. L. S. No. 37	49 99		02.78 52.04	The second		57. 9			54. 9	Holmfield	83. 92	1. 9238655
D. L. S. No. 38		09	45, 63 06, 86	117	10	43.1	297	10	25. 0	Mowbray	544, 43	2. 7359459
Lena elevator			19. 88 47. 76	134 174 248			314 354 68	03	44. 2 26. 5 14. 8	Ram_ Killarney Mowbray	20, 123, 90 11, 237, 11 27, 872, 28	4. 3037121 4. 0506547 4. 4451725
Enterprise elevator	49 99	05 33	09, 17 04, 76	136	48 01 31		229 315 63	55	21. 6 27. 9 35. 9	Lena_ Killarney Mowbray	11, 141, 35 13, 427, 58 19, 780, 43	4. 0469378 4. 1279979 4. 2962358
Holmfield school			04. 07 09. 01			47. 3 41. 9	286 75 171	42 23 50	00. 7 44. 7 23. 1	Killarney Mowbray Holmfield	14, 731, 67 13, 369, 98 1, 857, 13	4. 1682519 4. 1261307 3. 2688434
Cartwright church	49 99		44. 21 22. 71	103 196 355	23	49.5	283 16 175	25	23. 7 14. 2 05. 8	Holmfield Mowbray Taylor	10, 702, 68 8, 034, 04 8, 919, 08	4. 0294927 3. 9049341 3. 9503202
Hansboro school	48 99		09. 68 01. 26	193 209	04 14	12.6	13 29	07 17 16	36. 9 14. 6	Mowbray Taylor Clearwater	24, 232, 06 8, 028, 00 27, 896, 20	4, 3843904 3, 9046074 4, 4455450
Mather church			51. 24 25. 45	48	18 01	37. 2 25. 3	228 310 36		17. 4 03. 7 09. 6	Taylor Mowbray Clearwater	13, 681, 08 11, 421, 07 6, 479, 41	4, 1361203 4, 0577068 3, 8115357
Clearwater elevator			58. 04 32. 09	100 222 328	30 52 55	58. 1 13. 1	280 42 149	58	38. 8 08. 2 10. 6	Clearwater Pilot Mound Fallison	7, 068. 75 13, 956. 26 21, 390. 19	3. 8493428 4. 1447691 4. 3302147
D. L. S. No. 39			32. 73 41, 22	259	35	18. 5	79	35	29. 7	Star Mound (G, S, of C.)	306, 58	2, 4865490
Crystal City church	49 98		53. 30 11. 18	88 199 300	25	32. 4 14. 4 41. 7	268 19 120	27	10, 3 06, 7 05, 1	Clearwater Pilot Mound Star Mound (G. S. of C.)	13, 459, 96 9, 027, 61 19, 413, 62	4. 1290437 3. 9555726 4. 2881066
Fallison elevator	49 98	02 52	13. 42 04, 42		38 16 32		192 351 76		51. 9 01. 0 29. 9	Fallison Pilot Mound Star Mound (G. S. of C.)	7, 875, 78 21, 112, 06 10, 814, 19	3. 8962936 4. 3245306 4. 0339941
Purves elevator	49 98		28, 00 56, 26	130	49 28 11		213 310 175	20	19. 7 15. 9 45. 6	Fallison_ Pilot Mound_ Star Mound (G, S, of C.)	20, 934, 25 17, 198, 83 7, 238, 16	4. 3208575 4. 2354989 3. 8596284
Sarles school 1	48 99	56 00	23. 58 35. 94	237 250	25 10	51. 1 34. 1	57 70	38 15	48. 1 56. 0	Star Mound (G. S. of C.)	24, 802, 73 9, 225, 97	4, 3944995 3, 9650119
Clyde church 1	48 98		11. 94 44. 26	180 201	47 16	46. 4 20. 9	0 21	47 24	57. 8 06. 7	FallisonStar Mound (G. S. of C.)	22, 018. 29 34, 576. 50	4. 3427835 4. 5387810
St. Leon church 1	49 98	21 35	47. 65 26. 87			04. 2 34. 8	195 236		01. 2 58. 5	Star Mound (G. S. of C.)	35, 136, 59 27, 982, 51	4. 5457596 4. 4468866
Calvin school	48 98	51	09, 30 02, 62	193 213 243			13 33 63	41 50 23	58. 5 06. 3 51. 6	Fallison Star Mound (G. S. of C.) Cavers	13, 205, 22 27, 688, 70 26, 449, 67	4. 1207457 4. 4423025 4. 4224202
Pilot Mound school	49 98		07. 81 51. 92	157 255 321	38 57	07. 5 27. 6	337 76 141	37 13	29. 0 03. 4 50. 3	Pilot Mound Manitou Star Mound (G. S. of C.)	2, 707, 86 25, 755, 75 20, 304, 35	3. 4326257 4. 4108742 4. 3075891
Manitou Normal School	49 98	14 32	18. 49 22. 29	34 86 153	08 54	50. 5 22. 4 52. 8	214 266 333		28. 2 27. 2 11. 9	Star Mound (G, S, of C.) Pilot Mound Manitou	24, 018, 13 27, 164, 91 2, 416, 40	4. 3805392 4. 4340082 3. 3831680
Mariapolis church 1	49 98	21 59	34. 04 08. 37	289 340	39	21.9	109 160	58 19	58. 8 53. 9	Manitou Pilot Mound	33, 326. 93 15, 919. 89	4. 5227953 4. 2019400
Kaleida elevator	49 98	07 28	47. 75 08. 87	46 67 156	18	47. 0 02. 1 13. 1	226 247 336	15 06 20	58. 6 28. 6 20. 4	Kaleida Star Mound (G. S. of C.) Manitou	1, 797. 27 20, 190. 82 15, 528. 50	3, 2546144 4, 3051540 4, 1911296

¹ No check on this position.

Station			ide and itude	A	zim	uth	Bac	ek az	imuth	To station	Distance (meters)	Logarithm
	100	,	"	0	,	,,	0	,	"		TEN TEN	
Hannah school	48 98			165 269 283	44	18.8	345 89 103	57	17. 2	Star Mound (G. S. of C.) Maida Cavers	10, 033, 54 20, 983, 48 5, 869, 65	4. 001454 4. 321877 3. 768612
Snowflake school.	49 98		43. 75 24. 17	107 197 293	28	50.3	287 17 113	33	28. 6	Star Mound (G. S. of C.) Manitou Maida	5, 161, 63 24, 766, 49 20, 246, 89	3. 7127872 4. 3938642 4. 3063584
Wales church	48 98		36. 07 07. 08	154 198 238	31	02.9	334 18 58	36	15. 5	Star Mound (G. S. of C.) Kaleida Maida	20, 532, 15 26, 442, 91 17, 043, 13	4. 3124344 4. 4223093 4. 2315493
Mowbray elevator	48 98			65 177 297	36 35 44	43. 4	245 357 117	35	22.6	Cavers_ Kaleida Maida	10, 657, 38 13, 309, 95 6, 308, 48	4. 0276506 4. 124176; 3. 7999246
D. L. S. No. 40	49 98		12. 51 07. 88	233		59. 5	53			Darlingford		2. 5218406
Darlingford elevator	49 98		11. 02 36. 76	40 115 174	17	10.3	220 295 354	09		Kaleida Manitou Darlingford	12, 341, 82 14, 301, 75 3, 969, 32	4. 0913791 4. 1553891 3. 5987164
North Outlook	49 98		57. 954 31. 902	198 247 319	42 21 01	57.1	18 67 139	37	20.0	Morden Plum Coulee Walhalla		4. 225819 4. 428382 4. 334272
South Outlook.	49 98		55. 788 30. 818	102 195 311	45 15 32	23.7	282 15 131	18	39. 8 44. 4 21. 7	Numedahl Morden Walhalla	2, 544. 6 20, 424. 2 18, 888. 0	3. 405624 4. 310146 4. 276186
Windygates elevator 1	49 98		27. 17 02. 51	141 221	13	08. 4	321 41	06	57. 9	Kaleida North Star	15, 877, 15 12, 754, 11	4. 2007725 4. 1056501
Thornhill school 1	49 98		05. 92 54. 06	0 110		12.5 47.8	180 290			North Star Darlingford	12, 092. 69 11, 687. 71	4. 0825230 4. 0677294
Sperling elevator 1	49 97			39 58	51 40	47. 4 41. 3	219 238	27	43, 3 52, 1	North Star Darlingford		4. 7802565 4. 7611200
Roland elevator	49 97		07. 64 33. 18	19 34 65	05 48 47	59. 7 29. 8 18. 6	198 214 245	35	40. 2 14. 6 19. 5	Numedahl North Star Darlingford	40, 968. 77 37, 316. 55 35, 078. 43	4. 6124529 4. 5719015 4. 5450401
Kronsgart elevator	49 97		41. 58 48. 11	35 54 83	30 02 45	14. 4 13. 4 02. 2	215 233 263			Numedahl. North Star. Darlingford	35, 155, 06 34, 967, 10 39, 206, 03	4. 5459878 4. 5436596 4. 5933529
Church No. 10 1	49 98		39. 17 04. 24	156 295	00 30	04. 8 29. 0	335 115		35. 0 53. 8	North Star Numedahl	5, 929. 70 6, 106. 89	3. 7730327 3. 7858201
Homen church 1	48 98		54. 76 15. 05	101 220	28 56	36. 8 37. 6	281 41		22. 2 55. 7	MaidaNumedahl	13, 609, 39 10, 605, 94	4. 1338388 4. 0255492
Carman water tank 1	49 98		21, 29 08, 78	9 20	29 14	34. 4 28. 3	189 200		57. 8 55. 7	Numedahl North Star	54, 722, 55 48, 926, 89	4. 7381663 4. 6895476
D. L. S. No. 41	49 98	11 01		263	51	10. 4	83	51	25, 0	Morden	392, 74	2, 5941002
Olga church 1	48 98	$\frac{47}{02}$	48. 23 28. 85	166 221	$\frac{03}{29}$	34. 6 24. 3	345 41	59 35	45. 4 49. 9	NumedahlWalhalla	25, 648. 60 15, 744. 77	4. 4090637 4. 1971363
D. L. S. No. 42	49 97		27. 30 04. 16	123	55	03.6	303	54	58. 6	Plum Coulee	161, 96	2, 2093967
Kane elevator	49 97	21 43	16, 25 41, 39	49		43. 3 45. 9 44. 3	229	21 25 35	35. 6 34. 8 00. 2	Plum Coulee- Morden. Darlingford	23, 733, 94 27, 738, 55 49, 266, 02	4, 3753698 4, 4430838 4, 6925475
Lowe Farm elevator	49 97	21 35	15. 54 27. 74	26 46 77	34 36 41	10.7 24.1 21.5	206 226 257	26 12 05	49. 0 07. 0 23. 2	Plum Coulee Numedahl Darlingford	26, 420, 58 53, 830, 75 58, 945, 79	4. 4219423 4. 7310304 4. 7704528
Leroy church 1	48 97		24. 81 11. 23	77	49	14. 1 16. 5	257	42		WalhallaPlum Coulee	10, 947. 48 24, 262. 78	4. 0393143 4. 3849405
Altona mill chimney 1	49 97	06 33	20. 95 31. 32	105 353	47	59. 8 11. 7	285		10. 9 07. 0	Plum Coulee Neche	14, 733. 73 12, 770. 10	4. 1683127 4. 1061943
D. L. S. No. 43	49 97	07 30	05. 37 16. 51	112		41.5			37. 0	Altona	128. 56	2, 109122
Bathgate elevator 1	48 97	52 28	51. 40 25. 09	158 235	58 10	54. 9 57. 2	338 55	55 19	59. 2 09. 3	NechePembina	13, 205. 67 16, 175. 19	4. 1207604 4. 2088493
D. L. S. No. 44	49 97		07. 21 47. 59	267		29. 4			35, 0	Letellier	150.82	2, 1784630
Rosenfeldt elevator 1	49 97	$\frac{11}{32}$	56. 04 55. 33	66 294		54. 1 05. 7	246 114	48 23	37. 6 23. 4	Plum Coulee Letellier	16, 198. 04 21, 677. 01	4. 2094624 4. 3359994
Letellier elevator	49 97		06. 67 12. 82	314	10 14 31	53. 8 25. 3 11. 6	227 134 177	15	15. 3 35. 4 42. 3	Neche. Letellier Pembina	23, 426, 41 2, 622, 69 19, 072, 24	4. 3697058 3. 4187464 4. 2804016

¹ No check on this position.

GEOGRAPHIC POSITIONS OF TRIANGULATION STATIONS, GEORGIA STRAIT TO LAKE OF THE WOODS, MAJOR SCHEMES

Station			le and tude	A	zimu	ith	Back	k azi	muth	To station	Distance (meters)	Logarithm
Offshore range mark (west shore Point			,, 08, 104		, 48	30. 2		, 40	,, 11. 3	Parke	22, 525. 9	4. 352682
Roberts).	123	06	39, 524 08, 023	269	05	47. 0 23. 2			48. 4	Avenue Parke	1, 651. 3 23, 565. 3	3. 217826 4. 372273
Shore range mark (west shore Point Roberts).			17. 157	90 140	05	41.2	270	04 51	39.0	Offshore range mark Avenue	1, 674. 1 36. 50	3.223792 1.56235
Mon. 1	49 123		08. 027 16. 953	88 136	01 01			01 01		Shore range mark	4. 15 39. 15	0. 61813 1. 59276
Geoduck			00. 937 02. 208	85 229 312	53 26 17			30	44.4 06.3 29.0	Delta west base Delta east base Birch Point	5, 361. 7 7, 524. 3 17, 885. 6	3. 729302 3. 876467 4. 252503
Point Roberts, 1934			35, 140 26, 066	191 209 284	30		29	43 35 29	59. 8 15. 6 46. 3	Geoduck Delta east base Birch Point	8, 385. 9 15, 059. 1 15, 418. 2	3. 923548 4. 177798 4. 188033
Mon. 4			08. 107 05. 762	205 218 293	46	00.4	38	11 51 10	33. 7 58. 4 44. 0	Geoduck_ Delta east base Birch Point	5, 899. 6 13, 128. 9 17, 107. 4	3. 770824 4. 118229 4. 233183
Oertel	48 122	57 48	21. 217 57. 555	98 107 127	36 54 54	31. 6 47. 7 41. 6 04. 2	278 287 307	27 44	06. 9 53. 0 19. 9 15. 1	Point Roberts, 1934 Mon. 4 Geoduck Delta east base	15, 395. 0 16, 836. 7 17, 106. 4 17, 238. 6	4. 187379 4. 226256 4. 233158 4. 236503
Offshore range mark (east side Boundary Bay).	49 122		08. 208 50. 139		40 05 25	55. 1 10. 9 43. 3	269	39 53 15	19. 0 39. 9 45. 3	Oertel Mon. 4 Geoduck	5, 772. 7 18, 610. 2 16, 952. 9	3. 761380 4. 269752 4. 229244
Semiahmoo Lighthouse			32. 864 57. 991	30 93 112 188	28 03	16. 3 18. 1 07. 5 58. 0	273	51 16 53 19	46. 1 53. 0 15. 4 03. 9	Oertel. Mon. 4 Geoduck Offshore range mark.	4, 738. 2 18, 484. 6 17, 181. 0 1, 103. 4	3. 675618 4. 266809 4. 235048 3. 042744
Mon. 5			08. 110 21. 484	60 90 90 106	06 06	42. 1 17. 8 17. 8 25. 1	269 270	57 53 05 31	29. 3 39. 9 10. 9 20. 2	Semiahmoo Lighthouse Mon. 4 Offshore range mark Geoduck	2, 243. 6 20, 412. 2 1, 801. 9 18, 671. 9	3. 350949 4. 309889 3. 255737 4. 271188
Drayton I (U. S. C. & G. S.)	48 122	58 47	48. 704 16. 800	195 223		29. 1 26. 0		39 42	43. 2 53. 0	Semiahmoo Lighthouse Mon. 5	1, 416. 8 3, 393. 1	3. 151296 3. 530598
Trap (U. S. C. & G. S.)			50. 350 52. 451	136 157 188	10	42. 3 59. 6 47. 8	337	24 10 25	10.1	Drayton I	2, 488. 4 3, 435. 8 4, 301. 9	3. 395919 3. 536027 3. 633662
Miller			19. 332 00. 997	20 71 99 164	05 58	43. 1	251 279	50 04 57 32	04. 3 16. 1 20. 5 55. 3	Trap Drayton I Semiahmoo Lighthouse Mon. 5	2, 941. 2 2, 918. 8 2, 414. 9 1, 563. 3	3. 468522 3. 465203 3. 382901 3. 194046
Creek (U. S. C, & G. S.)	48 122		49. 162 59. 148	90 114 155		28.4	294	54 33 41	59.3	Trap	2, 305. 0 4, 420. 6 3, 056. 3	3. 362668 3. 645478 3. 485190
Whatcom (U. S. G. S.)	48 122		19. 671 34. 708	339	06		159	06		Whatcom (U. S. C. & G. S.)	0.14	9. 1399-1
Sisters (U. S. G. S.)	48 121	42 59		86 135		58. 1	266 315	06 23	07.8	Whatcom (U. S. G. S.) Sisters (U. S. C. & G. S.)	27, 558. 76 0. 51	4. 440259 9. 7059-1
Nooksack	48 122	54 13	21. 196 22. 496	22 321	38 59			32 10		Whatcom (U. S. G. S.)	26, 148. 2 28, 311. 2	4. 417445 4. 45195
Town	48 122		11. 208 48. 056			36. 5 23. 1			13. 1 48. 6	Nooksack Whatcom (U. S. G. S.)	26, 674. 4 10, 322. 6	4. 42609- 4. 01379
Toad	48 122		39. 300 41. 031		19 34	07. 2 28. 5	224 167		16. 4 03. 4	TownWhatcom (U. S. G. S.)	8, 979. 5 12, 007. 5	3. 95325 4. 07945
Frances (U. S. C. & G. S.)	100	42	06. 700	247		03.6			41. 0 41. 3	TownWhatcom (U. S. G. S.)	9, 951. 6 18, 103. 0	3. 997895 4. 257750
Chuckanut (U. S. C. & G. S.)	48	40	07. 391 37. 372	117 196	58	34.7	297 16		19. 7 27. 5	Frances (U. S. C. & G. S.)	7, 865. 4 7, 856. 2	3. 89572 3. 89521
John	48	46	13. 954 00. 258	2 241	34 19 00 11 06	49. 1 44. 2 48. 2 53. 0 33. 6	182 61 80 113 117 149	36 10 17 17	46. 4 04. 3	Frances Nooksack Toad Town Whatcom Chuckanut	7, 645. 5 31, 513. 9 15, 319. 5 9, 608. 0 19, 887. 5 13, 106. 1	3. 88340 4. 49850 4. 18524 3. 98263 4. 29858 4. 11747
Pearson	48 122		11. 057 55. 220	291 314 322 353	54 05 28	19. 7 15. 5 26. 4	112 134 142 173	16 34	47. 7 32. 9	Toad. Whateom. Town. John.	17, 470, 5 26, 211, 0 16, 342, 0 9, 245, 9	4, 24230 4, 41848 4, 21330 3, 96595
Bacon (U. S. G. S.)			46, 316 09, 316	97 180		38, 1	277		35. 8	SistersBacon (U. S. C. & G. S.)	34, 694, 4 0, 25	4, 540260 9, 4048-1

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POSITIONS OF TRIANGULATION AND TRAVERSE STATIONS

Station	Lat	titue	de and tude	A	zim	uth	Back	k azi	muth	To station	Distance (meters)	Logarithm
Davis			46, 558 05, 662	° 72 87	, 30 35	51. 8 10. 0	o 252 266	, 16 59	32. 6 47. 6	BaconSisters	24, 536, 2 57, 795, 1	4. 389808 4. 761891
Glacier	48 121	58	11, 401 21, 335	23 31 354	18 10 04	11. 1 29. 2	203 210 174	18 57	32. 4 11. 3	Glacier (U. S. C. & G. S.) Bacon Davis	1. 44 39, 851. 9 26, 858. 5	0. 1584 4. 600449 4. 429081
Jack	48 120		22, 707 18, 070	73 75 136	46 11 30	51. 5 42. 2 01. 0	253 255 316	21 00	25, 1 34, 9 10, 2	Bacon Davis Glacier	43, 287. 8 18, 761. 6 30, 234. 0	4. 636366 4. 273270 4. 480495
Hozomeen	48 121	58 00	56. 388 38. 800	26 46 85 350	33 37 20 00	12. 1 00. 4 12. 6 54. 8	206 226 265 170	14 09	34. 8 02. 6 52. 0 26. 0	Davis	31, 399, 9 51, 539, 6 16, 784, 6 23, 638, 4	4. 496928 4. 712141 4. 224911 4. 373618
Lightning	49 121		04, 478 54, 791	56 358	26 02	17. 2	236 178		08.3 48.0	Glacier Hozomeen	19, 685. 6 9, 523. 0	4. 294149 3. 978774
Frosty West	49 120	00 50	48, 890 48, 238	73 116	54 11	56. 1 25. 5	253 296		30. 5 47. 4	Hozomeen	12, 497. 3 13, 720. 8	4. 096815 4. 137379
Frosty	49 120	00 50	38. 987 10. 946	76 111	07 59	09. 4 18. 2	255 291	59 58	15. 7 50. 1	Hozomeen Frosty West	13, 150. 3 817. 2	4. 118937 2. 912347
Smoky		55 42	22. 464 18. 940	47 106 134 135	48 34 16 34	20. 7 05. 0 58. 6 26. 1	227 286 314 315	37 20 10 28	03. 8 15. 6 34. 4 30. 0	Jack Hozomeen Frosty West	24, 779. 9 23, 332. 5 14, 456. 3 13, 703. 1	4. 394100 4. 367961 4. 160056 4. 136818
Roche	49 120		15, 602 09, 610	21 78 80 97	41 33 13 03	30. 3 51. 3 11. 5 41. 2	201 258 260 276	24	22. 2 46. 7 38. 8 30. 1	Smoky_ Frosty_ Frosty West_ Lightning	13, 732. 6 14, 955. 7 15, 643. 1 27, 922. 8	4. 137752 4. 174807 4. 194324 4. 445959
Robinson	48 120	43 34	36, 680 25, 544	100 156	30 09	32. 9 40. 6	280 336		21. 0 44. 3	JackSmoky	28, 502. 7 23, 844. 7	4. 454886 4. 377392
A shnola	48 120	55 23	19, 022 56, 766	30 68 90 126	39 06 23 40	19. 1 39. 2 13. 1 00. 6	210 247 270 306	41	25. 8 32. 4 22. 3 17. 2	Robinson Jack Smoky Roche	25, 203. 1 44, 037. 8 22, 437. 9 21, 595. 1	4. 401454 4. 643826 4. 350983 4. 334356
Princeton	49 120	04 26	39, 348 52, 355	47 72 348	41 10 19	17. 7 23. 8 51. 3	227 252 168	29 01 22	38. 4 52. 2 03. 7	Smoky Roche Ashnola	25, 507. 9 14, 449. 3 17, 673. 5	4. 406675 4. 159848 4. 247322
Sheep (U. S. C. & G. S.)	48 120	58 23	36. 203 14. 331	8 110 158	04 31 28	20, 0 26, 8 39, 7	188 290 338	03 20 25	48. 0 11. 1 55. 1	Ashnola	6, 152. 1 19, 416. 3 12, 060. 9	3. 789022 4. 288166 4. 081379
Goat	48 120	42 22	16. 196 58. 297	100 177	06 10	27. 3 54. 9	279 357	57 10	50. 9 10. 9	RobinsonAshnola	14, 266. 7 24, 211. 3	4. 154324 4. 384018
Remmel			24. 722 44. 288	25 29 89 112 132	31 24 55 57	00. 1 00. 5 05. 6 52. 5	205 209 269 292 312	22 14 46 46	32. 8 48. 3 25. 2 27. 2	Remmel (U. S. C. & G. S.) Goat Ashnola Sheep Princeton	0. 11 27, 971. 5 14, 912. 5 15, 235. 1 25, 183. 7	9. 0294-1 4. 446715 4. 173550 4. 182844 4. 401119
Lake View			38. 302 29. 001	11 52 100	37 31 07	11. 4 39. 4 15. 8	191 232 279	35 20 54	29. 3 44. 5 07. 6	Remmel Ashnola Princeton	13, 673, 4 22, 259, 1 21, 509, 1	4. 135878 4. 347508 4. 332622
Windy, 1935			42, 078 10, 465	88 133	13 03	53. 7 19. 6	268 312	03 54	$\frac{40.2}{47.6}$	Remmel Lake View	16, 575. 1 18, 858. 6	4. 219455 4. 275510
Tiffany (U. S. G. S.)	48 119	40 55	10. 930 52. 593	88 96 145 174	03 48 34 25	26. 3 04. 9 38. 8	268 276 325 354	03 28 22 23	05. 2 09. 0 55. 2	Tiffany (U. S. C. & G. S.) Goat Remmel Windy, 1935	2, 89 33, 475, 1 34, 264, 2 28, 900, 9	0. 4609 4. 524722 4. 534841 4. 460911
Snowy	49 119	02 52	57. 034 03. 900	29 59 88	03 54 32	12. 5 55. 7 52. 1	208 239 268	58 40 19	35. 9 05. 0 42. 8	Windy, 1935 Remmel Lake View	15, 364. 8 27, 770. 4 21, 230. 9	4. 186528 4. 443582 4. 326969
Chopaka	48 119		27. 155 00. 828	18 76 79 148	46 40 34 52	43. 2 18. 1 47. 8	198 256 259 328	40 31 34 48	03. 0 53. 2 59. 1	Tiffany Windy, 1935 Chopaka (U. S. C. & G. S.) Snowy	33, 798. 1 14, 008. 0 3. 89 11, 907. 6	4. 528892 4. 146375 0. 5900 4. 075823
Lemanasky (U, S, G, S.)	48 119	44 37	35, 733 15, 823	50 70 115 128 153	59 24 38 56 28	24. 1 06. 9 52. 5 25. 9	230 250 295 308 333	59 10 12 41 21	24. 9 09. 8 08. 0 05. 4	Lemanasky (U. S. C. & G. S.) Tiffany Remmel Windy, 1935. Chopaka	9. 28 24, 253. 6 46, 705. 3 32, 837. 8 26, 647. 7	0. 9673 4. 384777 4. 669366 4. 516374 4. 425660
Similkameen	48 119	57 37	23, 799 09, 235	90 119	33 36	20. 1 30. 3	270 299	25 25	53. 9 15. 0	Chopaka	12, 035. 6 20, 895. 7	4. 080467 4. 320056
End	49 119		33. 257 07. 420	0 57 98	16 50 11	28. 3 35. 9 00. 8	180 237 277	16 43 59	26. 9 08. 1 43. 8	Similkameen- Chopaka- Snowy	7, 706. 2 14, 259. 4 18, 391. 3	3. 886843 4. 154101 4. 264612

Station			le and cude	A	zimı	ith	Back	azi	muth	To station	Distance (meters)	Logarithm
Osoyoos	48		21. 177 36. 962	68 114 202 255 317	31 04 02 47	56. 1 10. 0 32. 9 05. 8 58. 4	0 248 293 22 75 137	58 03	14. 9 30. 0 37. 9 05. 1 22. 1	Similkameen End	9, 886. 9 10, 022. 8 4, 669. 5 4, 985. 2 5, 767. 9	3. 995058 4. 000988 3. 669274 3. 697684 3. 761014
Hump	48 119	55 21	34, 553 31, 964	100 120 125	19	54. 9 06. 4 29. 9	279 300 305	56 07 18	08. 1 20. 6 24. 1	Similkameen End Osoyoos	19, 369, 6 22, 015, 2 12, 097, 8	4. 287121 4. 342723 4. 082706
Sidley		01 20	29. 833 52. 696	4 69 69 90	09 09 35 24	56. 3 13. 6 55. 0 29. 8	184 248 249 270		26. 7 56. 7 19. 3 13. 9	Hump Similkameen Osoyoos End	11, 004. 1 21, 258. 0 11, 371. 9 19, 802. 5	4. 041556 4. 327522 4. 055832 4. 296720
Gillespie	49 119	01 11	56. 798 54. 038	44 85	55 42	25. 6 12. 2	224 265	48 35	09. 6 25. 5	HumpSidley	16, 659. 4 10, 974. 2	4. 221660 4. 040372
Balsam	48 119		34. 876 23. 887	81 128 176	30 17 28	03. 5 31. 2 32. 9	261 308 356	22 10 28	25. 0 22. 0 10. 1	HumpSidleyGillespie	12, 515, 5 14, 723, 5 9, 963, 5	4. 097448 4. 168010 3. 998412
Bonaparte (U. S. G. S.)			07. 777 15. 714	82 111 126 148 168	54 44 25 05 22	26. 5 11. 0 09. 3 22. 6 07. 1	262 291 306 327 348	31 14 02 55 18	52. 8 14. 3 38. 9 06. 8 37. 2	Lemanasky Chopaka End Sidley Gillespie	37, 060. 1 52, 234. 7 45, 233. 7 31, 400. 0 28, 041. 5	4. 568907 4. 717959 4. 655462 4. 496929 4. 447802
Bolster	48 119	58 05	21, 234 05, 731	66 128	54 47	47. 4 12. 1	246 308	50 42	02. 2 03. 9	Balsam Gillespie	8, 365. 2 10, 640. 3	3, 922475 4, 026952
Tippie	49 118	02 59	10.368 49.700	42 88	15 26	17. 4 37. 9	222 268	11 17	18. 9 31. 0	BolsterGillespie	9, 558. 2 14, 718. 9	3. 980376 4. 167874
Copper	48 118		19. 615 56. 206	84 104 118 173	53 14 31 06	14. 8 58. 8 04. 0 08. 7	264 284 298 353		51. 0 20. 1 17. 0 28. 3	Balsam Bolster Gillespie Tippie	15, 275. 6 7, 753. 7 17, 981. 8 9, 047. 4	4. 183997 3. 889510 4. 254833 3. 956524
Knob	48 118		04. 201 44. 725	76 111	45 23	38. 1 57. 4	256 291	37 14	11. 6 50. 2	CopperTippie	14, 033. 8 15, 815. 6	4, 147174 4, 199085
Midway			43, 050 41, 288	14 61 93	43 30 05	39. 3 01. 6 57. 0	194 241 272	20	51. 4 47. 0 01. 7	Knob Copper Tippie	5, 073, 6 17, 013, 0 16, 037, 2	3. 705319 4. 230780 4. 205128
White	48 118		06. 026 00. 789	89 125	38 03	56. 9 53. 5	269 304	33 59	52. 1 36. 5	Knob Midway	8, 213. 1 8, 450. 8	3. 914509 3. 926900
Fir	48 118		22. 157 52. 004	79 114	14 34		259 294	12 28	39. 5 53. 1	White	2, 665. 4 10, 483. 2	3. 425758 4. 020494
Paris	49 118		28. 067 08. 653	28 47 71 92			208 227 250 272		32. 2 06. 4 41. 6 06. 1	Fir	4, 420. 5 6, 443. 0 13, 670. 3 11, 642. 4	3. 645467 3. 809091 4. 135778 4. 066044
Eagle	49 118		19.776 29.494	50 63	48 25	56. 9 32. 2	230 243	43 21	22. 8 16. 0	Fir	11, 606. 5 7, 704. 4	4. 064701 3. 886737
Hardy			45. 603 08, 008	64 85 171	48	40. 8 33. 0 19. 4	244 265 351	44	50. 6 00. 7 03. 2	Fir Paris Eagle	10, 418. 8 7, 346. 6 2, 941. 7	4. 017817 3. 866085 3. 468602
Grand Forks			18. 602 42. 376		04	28. 9 44. 0 11. 1 18. 9	262	16 56	18. 1 23. 4 18. 2 42. 1		15, 796. 5 5, 491. 1 12, 817. 2 6, 129. 1	4. 198562 3. 739657 4. 107794 3. 787398
Danville west base	49 118		21. 294 25. 102	128 145 209	49			47		Hardy Eagle Grand Forks	4, 211. 9 6, 665. 6 4, 181. 9	3. 624475 3. 823839 3. 621373
Danville east base	49		21, 146 56, 532	90 184					11. 7 00. 9	Danville west base Grand Forks	1, 800, 1 3, 639, 8	3. 255290 3. 561079
Clement	49 118	01 28	32, 366 48, 792	240 313 347	57	09.6	60 133 167	58	34.3		2, 938. 4 3, 169. 2 2, 247. 7	3. 468113 3. 500950 3. 351732
Siteum,	48 118		48, 353 30, 052	93 109 128 138 167	14 35 58	02. 7 46. 8 49. 4	289 308 318	05 31 54	15. 4 31. 7 18. 1	Paris Hardy Eagle	8, 784. 1	4. 213224 4. 177017 3. 943698 4. 046087 3. 823421
Gilpin	49 118	02 22	23, 646 03, 252	32 57 64 83 88 98	36 03 59 27	53. 6 40. 4 18. 1	237 243 263 268	32 59 52 23	59. 0 05. 2 49. 0 47. 3	Danville east base Danville west base Hardy Grand Forks	7, 058. 6 8, 629. 7 11, 127. 3 5, 671. 2	3, 895825 3, 848721 3, 935996 4, 046391 3, 753674 4, 065524

Station			de and tude	A	zim	uth	Back	k azi	muth	To station	Distance (meters)	Logarithm
Cascade	49		11. 800		37	17. 5			40.1	Siteum	12, 407. 3	4. 093678
Owl	118 48 118	16 58 16	43. 656 36. 670 34. 204	93 91 136	23	36. 3 11. 5 29. 2	271 316	50 19	34. 9 27. 2 20. 8	Gilpin Siteum Gilpin	6, 501. 5 10, 902. 4 9, 689. 2	3. 813012 4. 037522 3. 986290
Horn	48		06, 954 29, 192	178 86 109	43	42. 9 41. 1 40. 3	358 266 289		35. 8 48. 8 40. 6	Cascade	6, 648. 5 15, 989. 7 17, 124. 9	3. 822724 4. 203841 4. 233628
Buck	118 49 118		44. 787 50. 311	6	42 29	01.1	186 245	41 18	31. 7 56. 2	HornOwl	6, 775. 4 18, 413. 8	3. 830938 4. 265144
Record	49		49. 306 51. 684			30. 7 10. 9	266	06	01, 3	Horn	16, 955. 4 17, 947. 8	4, 229307 4, 254011
Northport	48 117	54	31. 106 03. 442	121 139	17	48. 0 03. 0 18. 4	301 319	20 09	15. 7 25. 8 10. 3	Horn Buck	13, 421. 0 16, 349. 7 20, 139. 9	4. 127785 4. 213509 4. 304058
Lake (U. S. C. & G. S.)	49 117	02 44	20. 035 43. 327	31 123	19 45 09	31. 7 26. 1 43. 4	357 211 303	18 39 03	55. 3 54. 1 34. 4	NorthportRecord	20, 973. 6 17, 028. 0 11, 834. 7	4. 321674 4. 231164 4. 073157
Beaver (U. S. C. & G. S.)	49	06	50. 600 12. 351	55	15		234	55	33. 3 00. 2	NorthportLake	39, 921. 7 25, 191. 9	4, 601209 4, 401261
Porthill	49 116		17. 825 49. 859									
Smith	48 116		23. 070 49. 259	173	35	23. 4	353	34	37. 7	Porthill	11, 028. 0	4. 042496
Hawkins	49 116	01 16	14. 612 59. 186	64 90	49 21	38. 5 35. 8	244 270		26. 0 36. 9	SmithPorthill	25, 419. 4 24, 191. 7	4. 405166 4. 383667
Hell Roaring (U. S. G. S.)	48 116		31. 662 10. 010	93 113 159	25 37 29	35. 4 52. 1 36. 8	273 293 339	08 20 26	30. 9 01. 1 43. 9	Smith Porthill Hawkins	27, 720, 3 31, 487, 9 13, 291, 9	4. 442798 4. 498144 4. 123588
Ewing (U. S. G. S.)			45. 637 49. 501	82 114 266	39 45 57		262 294 86	28 31 57	42. 6 18. 5	Hell Roaring Hawkins Ewing (U. S. C. & G. S.)	17, 667. 6 24, 379. 3 5. 62	4. 247177 4. 387021 0. 7497
Hunter	49 116		27. 533 20. 756		18 58	16. 5 01. 0			14. 4 41. 5	HawkinsEwing	12, 977. 1 13, 991. 3	4. 113178 4. 145859
Mahon	49 115	06 59	09. 371 06. 793	45 67 358	24	57. 5 55. 3 12. 4	225 247 178	11	29. 8 25. 2 25. 6	Hunter Hawkins Ewing	12, 386. 0 23, 598. 2 19, 271. 4	4. 092930 4. 372879 4. 284914
Burke	48 115		14, 851 15, 229	64 99	19 36	47. 1 02. 0	292	14 04	12. 5 32. 3 53. 6 20. 2 10. 6	Ewing Hell Roaring Hawkins Hunter Mahon	6, 500. 4 20, 199. 0 23, 141. 5 10, 685. 1 12, 848. 0	3, 812942 4, 305329 4, 364391 4, 028779 4, 108836
Lodge	49 115	03 47	44. 874 02. 110	58 106	41 57	18. 4 40. 9	238 286	32 48	50. 2 33. 2	Burke Mahon	16, 018. 4 15, 368. 2	4. 204618 4. 186623
Roswell	48 115	57 46	32, 578 06, 057	78 102 135 174	06 16	12. 2 15. 7	257 281 315 354	06	53. 6 02. 1 26. 1 15. 8	Ewing Burke Mahon Lodge	15, 882. 6 15, 162. 0 22, 503. 2 11, 557. 1	4. 200921 4. 180757 4. 352244 4. 062849
Bevis			57. 284 20. 955	47 88		24. 7 50. 3	227 268	44 23	17. 7 00. 6	Roswell Lodge	17, 694. 2 14, 238. 6	4. 247831 4. 153468
Wood	48 115	59 33	05. 773 58. 758	79 118 169			258 298 349	54 21 29	35. 2 51. 6 09. 9	Roswell Lodge Bevis	15, 069. 0 18, 100. 4 9, 158. 8	4. 178085 4. 257687 3. 961839
Caribou	48 115	59 30	34. 813 44. 218	77 145	14 17	26. 6 38. 9	257 325	11 14	59. 8 10. 0	Wood Bevis	4, 055. 6 9, 866. 4	3. 608054 3. 994159
Yaak	48 115		01. 443 39. 791	87 99 111 130	58 18		291	03 51 13 05	28. 1 45. 5 20. 1	Yaak (U. S. C. & G. S.) Wood Caribou Bevis	0.39 11,539.5 7,951.9 17,046.0	9. 5888-1- 4. 062187 3. 900471 4. 231623
Purcell	49 115		05. 891 25. 875	2 69 111	50 56 46	31.5	182 249 291		27. 6 45. 9 57. 0	Yaak Caribou Bevis	5, 704. 9 8, 188. 0 14, 318. 9	3. 756248 3. 913176 4. 155909
Kootenai	49 115	05 21	35. 827 07. 157	17 46	07 28		197 226	04 21	55. 2 33. 4	YaakCaribou	14, 686. 3 16, 177. 7	4. 166912 4. 208917
Frost			19. 036 07. 117	54 69 101	50 53 05	19.1	234 249 280	40 43 57	35. 8 15. 9 41. 5	Yaak Purcell Kootenai	20, 216. 5 17, 283. 6 12, 405. 3	4. 305707 4. 237633 4. 093606
Gateway			07. 884 09. 628	77 95 171	38 58 26	30. 5 09. 9 50. 2	257 275 351	27 47 26	33. 9 23. 6 06. 8	Yaak Purcell Frost	18, 118. 5 17, 492. 7 7, 845. 9	4. 258123 4. 242856 3. 894644

Station			le and tude	A	zimı	ith	Back	azi	muth	To station	Distance (meters)	Logarithm
Campbell	48	, 57 09	40. 017 10. 208	92 108 135 165 169	06 57 20 11 06	07. 9 28. 0 13. 1 25. 1 14. 4	o 271 288 315 345 349	45 11	26. 7 57. 0 11. 8 40. 3 46. 2	Yaak Purcell. Kootenai. Gateway. Frost.	18, 920. 0 19, 672. 2 20, 692. 6 4, 724. 9 12, 553. 2	4. 276921 4. 293853 4. 315815 3. 674395 4. 098754
Bowdich	48 115	59 09	35. 557 17. 616	133 357	22 34	21. 8 55. 7	313 177		42. 6 01. 3	GatewayCampbell	1, 454. 3 3, 572. 4	3. 162662 3. 552957
Young			32, 521 44, 124	193 222 310		15. 4 55. 1 29. 6	13 42 130	23 06 20	41. 4 00. 3 40. 4	Gateway Bowdich Campbell	3, 028. 2 2, 624. 0 2, 505. 9	3. 481189 3. 418972 3. 398961
Gateway north base	48 115	59 10	33. 904 15. 927	186 267 339		14. 2 38. 0 33. 5	6 87 159	57 32 12	19. 0 22. 0 23. 1	Gateway Bowdich Campbell	1, 186. 5	3, 024277 3, 074269 3, 575583
Gateway south base			54. 450 09. 362	173 219 332	45 38 22	05. 2 09. 4 25. 5	353 39 152	45 38 23	00. 2 48. 4 10. 1	Gateway north base Bowdich Campbell	1, 226. 09 1, 649. 1	3, 088525 3, 217238 3, 41414
Baldy	49 114	02 58	35. 078 40. 050	54 102	37 01	42. 7 59. 7	234 281	29 52	47. 1 35. 4	Campbell Frost	15, 720. 3	4. 196465 4. 190437
Green	48 114	57 55	40. 241 59. 047	90 123 160	03 49 15	29. 5 29. 9 14. 2	269 303 340	53 38 13	32. 7 04. 4 12. 7	Campbell FrostBaldy	22, 186. 1	4. 206657 4. 346083 3. 985786
Wam			19. 341 35. 187	94 128	08 29	10. 8 20. 2	274 308	02 21	36. 1 43. 8	GreenBaldy	9, 052. 6 15, 693. 7	3. 95677 4. 195726
Wig			46. 983 25. 770	24 59 95		35. 5 12. 2 42. 2	204 239 275	57 18 10	12.5 14.3 42.5	Wam Green Baldy	14, 960. 6	3. 960023 4. 174948 4. 209546
Canada			07. 753 50. 958	45 55 82		36. 4 12. 8 03. 8	225 235 261	03 07 56	54. 1 32. 6 21. 6	Wig GreenBaldy	20, 983. 0	3. 78953 4. 32186 4. 31569
Tuchuck			34. 783 25. 919	76 85 108 134 170	01 34	16. 3 28. 4 33. 7 00. 2 26. 2	256 264 288 314 350		07. 2 44. 5 47. 9 13. 9 22. 0	Wam Green Baldy Wig Canada	10, 221. 0 19, 053. 4 23, 441. 5 8, 508. 5	4. 00949: 4. 27997: 4. 36998: 3. 92985: 4. 01828:
Hefty			53. 932 17. 940	71 104 130		26. 5 06. 1 54. 9	251 284 310	51 21 23	48. 8 41. 9 12. 8	Tuchuck Wig	7, 870. 9 14, 012. 8	3. 89602 4. 14652 4. 08240
Kishenehn			40. 908 09. 375	67 69 91	11		247 248 271	46 56 39	34. 7 11. 9 40. 0	Hefty- Tuchuck Canada	18, 609. 2 26, 465. 5 26, 434. 7	4. 26972 4. 42268 4. 42217
Kintla			43. 474 19. 035	96 103 112 151	41 24	16. 4 29. 5 28. 3 46. 9	275 283 292 331	59 26 03 03	34. 6 25. 1 41. 4 22. 5	Tuchuck Hefty Canada Kishenehn	25, 082. 6 36, 269. 4	4. 50594 4. 39937 4. 55954 4. 16821
Starvation			17. 138 02. 532	117 348		55. 0 07. 0	297 168	16 28	48. 6 25. 1	KishenehnKintla.		3.75135 4.02201
North Divide			57. 990 51. 954	27 63 81	17 32 02		207 243 260	12 25 52	10. 0 58. 3 58. 0	Kintla Starvation Kishenehn	11, 130, 3	4. 23508 4. 04650 4. 18057
South Divide			31. 496 50. 457		58 03 05	32.0	247 288 334	50 54 02	13. 8 19. 3 24. 2	Kintla		4. 13981 4. 19676 4. 04981
Waterton	49 113	01 58	24. 967 06. 098	63 119	25 00	51. 2 46. 6	243 298	21 53	31. 3 24. 1	South Divide North Divide	7, 827. 2	3. 89360 4. 13336
Campbell S. W	48 113	58 56	40, 945 14, 764	99 129 155	30	27. 2	279 309 335		07. 9 40. 8 19. 6	South Divide North Divide Waterton	18, 336. 9	3. 97293 4. 26332 3. 74423
Sofa			49. 860 04. 607	62 86		48. 4 39. 0	242 266	22 39	53. 2 19. 6	Campbell S. WWaterton	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	4. 10081 4. 12905
Belly.			18. 650 24. 432	100 116 166	14	54. 7	280 296 346	48 05 19	38. 8 19. 9 38. 7	Campbell S. W	13, 469. 6 17, 253. 5 8, 622. 0	4. 12935 4. 23687 3. 93560
Rim	49 113		16. 264 18. 023	53 95		57. 9 18. 6	233 274	21 54	50. 9 55. 7	BellySofa	12, 315. 7 11, 962. 0	4. 09045 4. 07780
Chief Mountain	48 113	55 36	57. 814 31. 531	103 130 174			282 310 354	54 07 30	42. 7 31. 4 19. 8	Belly Sofa Rim	11, 127. 8 16, 851. 6 9, 882. 7	4, 04640 4, 22664 3, 99487
Pike	48 113		01, 824 58, 003	69 117		07. 4 31. 0			40. 1 28. 3	Chief Mountain	11, 128. 7 12, 871. 8	4. 046443 4. 109633

Station			e and ude	A	zimu	ith	Back	azi	muth	To station	Distance (meters)	Logarithm
Police		01	27. 112 12. 485	8 48 88	18 14	21. 6 08. 3 11. 0	188	07	47. 2 06. 4 33. 7	Pike Chief Mountain Rim	6, 408. 8 15, 255. 0 12, 307. 2	3. 806778 4. 183413 4. 090161
St. Mary			34. 862 21. 336	54 88	42 24	46. 9 03. 5	234 268		02. 1 53. 0	Pike Police	11, 379. 1 835. 6	4. 056107 2. 922013
Spider			30, 101 43, 424	95 128 174	46	54. 4 34. 8 01. 5	275 308 354	40	41. 3 55. 9 32. 9	Pike Police St. Mary	10, 108. 0 11, 702. 5 7, 600. 2	4. 004665 4. 068280 3. 880827
St. Mary north base.	48 113		43. 716 53. 373	221 316		$00.7 \\ 43.2$	41 136	59 55	55. 5 06. 5	St. MarySpider	4, 618. 9 5, 653. 1	3. 664543 3. 752286
St. Mary south base		58 23	04, 381 31, 788			38. 3 59. 3 06. 3		17 47 51	07. 3 23. 0 58. 6	St. Mary north base St. Mary Spider	3, 166. 5 7, 567. 3 4, 764. 4	3, 500574 3, 878943 3, 678004
Galbreath			48, 360 32, 244	90 105 121 151		03.5 42.0 47.3 15.0	270 285 301 331	07 33	14. 1 19. 6 37. 9 36. 9	Chief Mountain Pike Spider St. Mary	25, 633. 3 15, 724. 1 6, 000. 2 12, 212. 0	4. 408804 4. 196566 3. 778165 4. 086786
373-S	48 113	59 13	52. 693 25. 878	18 60 110	11	09.8 40.0 27.3	198 240 290	$\frac{47}{06}$	34. 4 55. 1 13. 6	Galbreath Spider St. Mary	7, 973. 4 8, 851. 3 9, 013. 3	3. 901646 3. 947009 3. 954882
Stack	48 113		04. 533 10. 962	64 117		35. 2 20. 4	244 297	51 31	02.4 22.8	Galbreath	9, 915. 2 7, 222. 5	3. 996303 3. 858690
Milk			16, 771 44, 024	53 60 86	03 08 27	35. 7 56. 2 44. 2	233 240 266	00 00 20	14. 3 02. 0 25. 2	Stack. Galbreath	6, 792. 9 16, 620. 7 11, 849. 9	3. 832055 4. 220649 4. 073715
Lincoln			57. 805 11. 847	95 128 169 240	19 14	31. 3 20. 1 06. 0	275 308 349 60	23 14 12 20	27. 9 49. 3 56. 5	Galbreath Stack Milk Mussetter (U. S. C. & G. S.)	16, 368. 7 9, 310. 1 10, 030. 1 3, 41	4. 214014 3. 968956 4. 001307 0. 53275
New	48 112	57 56	33, 331 45, 765	54 120		52. 0 23. 8	234 300	03 39	$\frac{46.1}{08.2}$	Lincoln	819. 3 989. 0	2. 913432 2. 995216
Bunch	49 112	00 56	24. 912 22. 965	5 35 88	07	03. 7 05. 0 21. 3	184 215 268	59 02 20	46. 5 41. 8 48. 4	New Lincoln Milk	5, 320. 6 12, 348. 0 8, 967. 5	3. 725964 4. 091596 3. 952673
Gap	48 112	58 55	57. 158 23. 889	32 156	45 06	05. 5 45. 9	212 336	44 06	03. 7 01. 3	NewBunch	3, 078. 7 2, 965. 0	3. 488373 3. 472018
Ridge	48 112	58 52	49. 240 44. 285	64 94 123 176	19 38	09. 7 35. 0 21. 6	244 274 303 356		07. 7 34. 7 36. 7	New	5, 442, 5 3, 254, 6 5, 338, 3 3, 74	3. 735795 3. 512493 3. 727401 0. 5723
Bluff	49 112		13. 341 55. 037	12 45 74	16		192 225 254	40 14 36	04. 4 11. 3 25. 5	Ridge Gap Bunch	4, 562. 6 5, 976. 5 5, 646. 3	3. 659217 3. 776446 3. 751761
Center		59 46	18. 687 04. 725	83 116		10. 8 06. 5	263 296	34 24	$\begin{array}{c} 09.3 \\ 42.1 \end{array}$	RidgeBluff	8, 174. 8 7, 952. 2	3, 912477 3, 900486
Bench	49 112		11. 858 05. 914	36 74 102	43	20. 8 52. 1 39. 9	216 254 282	02 38 49	36. 4 06. 2 31. 1	Center Ridge Bluff	2, 031. 6 9, 661. 6 8, 528. 2	3. 307830 3. 985051 3. 930855
South	48 112	57 44	00, 595 11, 892	107 151 169	43	57. 6	287 331 349		$\begin{array}{c} 45.\ 6 \\ 32.\ 5 \\ 40.\ 7 \end{array}$	Ridge Center Bench	10, 949. 3 4, 844. 0 6, 009. 6	4, 039386 3, 685202 3, 778849
Table	49 112		58, 021 44, 491	29 75	55 00	09. 7 07. 3	209 254	52 56	33. 2 50. 0	SouthBench	8, 460. 4 5, 500. 8	3. 927389 3. 740423
Bend	48 112		04, 510 10, 691	72 118 160	36	50.6	252 298 340	06 32 24	28. 2 22. 6 24. 1	South Bench Table	6, 437. 5 8, 224. 3 5, 689. 1	3. 808718 3. 915099 3. 755046
River			30. 609 41. 085	33 68	42 51	54. 9 35. 6	213 248	39 47	31. 5 01. 2	Bend Table	9, 879. 1 7, 917. 1	3. 994719 3. 898564
Antelope	48 112	58 29	13. 134 14. 636	88 110 140	02	12. 8 01. 4 04. 2	268 289 320	40 53 07	43. 2 20. 8 57. 8	BendTableRiver.	12, 125. 9 14, 920. 3 10, 357. 7	4. 083715 4. 173779 4. 015263
Line	48 112	59 24	29. 296 05. 174	69 113		54. 9 07. 9	249 293	28 22	01. 3 07. 8	AntelopeRiver	6, 718. 0 14, 083. 0	3. 827242 4. 148696
Foot	49 112		02. 899 44. 996	4 43 93	22	27. 9 59. 1 39. 3	184 223 273	56 18 36	12. 7 50. 3 23. 9	Line Antelope River	4, 762. 8 9, 760. 6 13, 353. 1	3. 677858 3. 989476 4. 125582
Track	48 112	59 22	42. 649 27. 764	78 160			258 340	13 04	22. 1 49. 3	LineFoot	2, 022. 7 4, 608. 0	3. 305940 3. 663516
Clear	48 112		31.382 55.589	114 139	54 36	57. 3 08. 8	294 319	52 34	34. 3 59. 3	Line Track	4, 249, 7 2, 891, 2	3. 628361 3. 461078

Station			de and tude	A	zim	uth	Back	az	imuth	To station	Distance (meters)	Logarithm
Lake			52. 102 53. 120	30 54 92			210 234 272		54. 3 51. 8 04. 4	Clear Track Foot	7, 225. 0 6, 865. 9 7, 155. 4	3. 858841 3. 836695 3. 854633
Corner	48 112		05. 228 32. 980	101 176		53. 3 33. 2	281 356		20. 4 18. 0	ClearLake	4, 199. 0 7, 020. 5	3. 623151 3. 846366
Horse	49	01	45. 885 33. 650	1.9 47 93	36 28	00. 6 26. 9 34. 2	199 227 273	34 24		Corner Clear Lake	7, 235, 2 8, 883, 6 2, 839, 7	3. 859448 3. 948591 3. 453268
Cairn		58 09	11.870 52.469	88 133		35. 7 01. 3	268 313	41 35	48. 4 43. 8	Corner Horse	9, 368. 5 9, 581. 4	3. 971668 3. 981427
Red			23. 582 21. 379	37 71 104	05	02. 4 43. 6 48. 4	217 250 284	02 58 12	02.1	Cairn Corner Horse	5, 098. 1 13, 148. 6 10, 320. 4	3. 707412 4. 118881 4. 013698
Crook	49 112	01 03	13. 288 04. 567	55 73		19. 9 52. 2	235 253	54 34	12. 1 38. 4	CairnRed	10, 008. 2 5, 439. 8	4. 000354 3. 735582
Cliff.	112	58 02	47. 055 49. 787	82 118 176	24	15. 7 04. 0 47. 9	262 298 356	44 20 11		Cairn Red Crook	8, 664. 3 6, 275. 0 4, 527. 4	3. 937732 3. 797611 3. 655845
Tennant	49 111		01. 830 24. 606	52 93		43. 7 23. 8	232 273	17 31	23. 6 52. 4	Cliff Crook	6, 811, 0 5, 699, 4	3. 833208 3. 755829
Moberly	48 111	58 57	49, 270 45, 173	89 124 168	23 27 55	21.6	269 304 348	20 23 55	20.6	Cliff Crook Tennant	6, 194, 5 7, 870, 1 4, 172, 7	3. 792004 3. 895982 3. 620415
Peg	49 111	00 59	07. 820 09. 519	208 324	40 44		28 144	41 45		Tennant Moberly	1, 901. 8 2, 971. 2	3. 279160 3. 472937
Coutts N. W. base	49 111			264 330 340			85 150 160	00 22 36	27. 1 32. 9 19. 9	Tennant Moberly Peg	1, 460. 7 4, 564. 8 1, 633. 9	3. 164561 3. 659422 3. 213220
Coutts S. E. base	49 111	00 58	40, 823 41, 210	29 115 207 341	28	07.6	209 295 27 161	26 00 28 42	01. 7 36. 5 20. 2 51. 4	Peg Coutts N. W. base Tennant Moberly	1, 170. 6 1, 233. 55 731. 4 3, 629. 4	3, 068422 3, 091157 2, 864159 3, 559837
Center I	49 111			57 113	46 02	36.7 21.4	237 292	44 59	24. 6 39. 6	Moberly Tennant	4, 205, 9 4, 734, 4	3, 623863 3, 675263
Coffin	49 111	02 52	50. 079 06. 881	32 42 66	34 46 29		212 222 246	32 42 24	49. 1 18. 8 41. 3	Center I. Moberly. Tennant.	6, 164. 2 10, 128. 8 8, 369. 8	3. 789878 4. 005560 3. 922714
Griffith	48 111	58 50	20. 586 49. 241	96 122 169	01 35 16		275 302 349	56 32 15		Moberly Center I Coffin	8, 504, 6 5, 813, 4 8, 473, 3	3, 929653 3, 764430 3, 928051
Ashe	49 111	$\frac{03}{46}$	42. 705 06. 140	30 77	03 31	39. 8 24. 0	210 257	00 26	06. 1 51. 5	Griffith Coffin	11, 493. 8 7, 502. 7	4. 060465 3. 875219
Sheep	48 111	57 43	46, 590 55, 552	97 133 166			277 313 346	$04 \\ 08 \\ 25$	15. 8 31. 9 27. 4	Griffith Coffin Ashe	8, 479, 4 13, 697, 1 11, 316, 5	3. 928367 4. 136630 4. 053713
Center II	48 111	58 42	42, 678 01, 578	53 151	14 49		233 331	12 46	38. 4 38. 6	SheepAshe	2, 894. 0 10, 516. 3	3. 461499 4. 021864
Milk			49, 916 38, 108	39 89	25 03	21. 3 53. 6	219 268	20 55		Center II	12, 279, 4 12, 751, 4	4. 089177 4. 105557
Mountain	48 111		53. 827 43. 832	81 88 118 158	25 19 46 51	30. 8 08. 8 58. 2 23. 6	261 268 298 338	17 12 36 49	04. 1 08. 0 52. 5 12. 0	Sheep_ Center II Ashe Milk	13, 818, 0 11, 346, 6 18, 583, 6 9, 808, 1	4. 140446 4. 054865 4. 269130 3. 991585
Center III	49 111	00 26	08. 268 49. 500	72 122	19 34	55. 2 49. 7	252 302	15 28	27. 8 10. 5	MountainMilk	7, 561, 5 12, 734, 8	3. 878609 4. 104992
Roscoe	48 111	57 19	02. 394 27. 584	102 122	04 37	58. 2 20. 1	281 302	54 31	57. 6 46. 7	MountainCenter III	16, 557. 4 10, 664. 4	4. 218992 4. 027938
Breed	49 111	02 18	29, 309 43, 334	5 66 68 96	05 14 47 59	40. 1 55. 4 45. 5 50. 4	185 246 248 276	05 08 37 47	06, 7 48, 4 11, 1 03, 9	Roscoe. Center III Mountain. Milk	10, 138. 9 10, 795. 8 18, 331. 4 20, 754. 6	4, 005990 4, 033255 4, 263196 4, 317114
Center IV			27. 388 58. 416	66 120	39 47	48.3 47.8	246		24. 2 56. 8	RoscoeBreed	11, 282. 6 10, 992. 1	4. 052410 4. 041082
Bear	49 111	01	18. 446 47. 792	37	44 19	46. 7 09. 6	217	43 11	08. 1 39. 9	Center IVBreed	4, 338. 0 12, 293. 9	3. 637286 4. 089688
East Butte		54	08. 105 58. 779	111 139	04 48 41	41. 5 51. 7 02. 7 58. 1	290 319	56 40 38	02. 2 45. 4 47. 2 21. 1	Roscoe Breed	15, 019, 5 20, 286, 9 10, 518, 6 13, 331, 2	4. 176656 4. 307215 4. 021956 4. 124868

Station			de and tude	А	zim	uth	Bac	k az	imuth	To station	Distance (meters)	Logarithm
Center V	6 48 111			。 36 110	, 00 56	77 16. 1 58. 7	The second second	55 51	44. 1 49. 5	East ButteBear	12, 495. 4 8, 912. 9	4. 096751 3. 950018
Laird	48 111		20, 600	75 168		40. 3 09. 3	255 348		10.3	East Butte Center V	9, 191. 7 8, 028. 7	3. 963397 3. 904647
Кор	49 111	01 00	38. 671 20. 972	1 27 33 86	59 25 49 34	54. 4	181 207 213 266	59 24 44 28	29. 3 26. 5 09. 1 28. 2	Laird Center V East Butte Bear	11, 686, 2 4, 286, 8 16, 746, 4 10, 315, 6	4. 067675 3. 632138 4. 223921 4. 013493
Center VI	48 110			33 121	41 26	18, 8 13, 5	213 301	37 22		LairdKop	10, 190. 3 6, 134. 9	4, 008189 3, 787810
Lost	49 110		41. 254 52. 541	61 102	50 42	21. 6 25. 9	241 282	48 37	42. 9 32. 7	Center VI Kop	3, 015. 0 8, 089. 1	3. 479284 3. 907900
Chester	110		11, 013 54, 472	115 168 180	50 09 09	14.5	295 348 0	45 07 09	52. 0 37. 3 43. 5	LairdCenter VI Lost	9, 195. 3 12, 757. 3 13, 908. 5	3, 963564 4, 105758 4, 143282
Center VII	48 110	59 48	09, 906 54, 218	28 114	53 59	39. 7 11. 3	208 294	49 55	53. 3 26. 1	Chester Lost	12, 659. 2 6, 688. 3	4. 102406 3. 825318
Strode	48 110		58. 812 44. 538	57 128	54 35	$\frac{29.0}{48.7}$	237 308	47 32	34. 4 40. 3	Chester Center VII	13, 224, 1 6, 495, 3	4. 121366 3. 812599
Spencer	49 110	02 43	21. 430 09. 250	11 49 76	52	32. 2 18. 2 44. 1	190 229 256	59 47 36	20. 3 57. 8 38. 4	Strode Center VII Lost	10, 152, 7 9, 173, 1 13, 430, 3	4. 006581 3. 962517 4. 128087
Center VIII	48 110	58 35	04. 989 25. 065	79 130	52 04	32. 5 05. 5	259 309	45 58	30. 5 15. 1	StrodeSpencer	11, 563. 4 12, 319. 2	4. 063086 4. 090584
Christianson	48 110	56 31	01. 545 11. 663	96 126 128	11 30 53	21. 6 51. 5 12. 0	276 306 308	27	08. 5 40. 4 10. 4	Strode Center VIII Spencer	16, 636, 2 6, 412, 7 18, 723, 6	4. 221054 3. 807044 4. 272390
Bar 5			22. 716 50. 507	6 34 56 83	54 44 57 25	38. 3 38. 9 47. 4 34. 3	186 214 236 263	40 46	26.4	Christianson Center VIII Strode Spencer	13, 727, 9 11, 939, 7 21, 698, 6 16, 329, 9	4. 137605 4. 076994 4. 336433 4. 212984
Center IX	48 110	59 24	48, 196 02, 134	51 133	20 09	11. 3 14. 7			47. 3 51. 6	Christianson Bar 5	11, 196, 1 9, 695, 6	4. 049065 3. 986573
Blacktail	49 110	$\frac{03}{22}$	34. 999 49. 801	11 87	51 30	$08.6 \\ 01.4$	191 267	50 24	14. 0 43. 6	Center IX	7, 158. 8 8, 549. 8	3. 854839 3. 931956
Pugsley & Simpson	48 110	58 19	17. 301 56. 029	73 119 160	06 19 13	17. 2 26. 9 49. 1	252 299 340	16	47. 6 21. 2 37. 9	Christianson Center IX Blacktail	14, 371. 5 5, 737. 9 10, 430. 1	4. 157502 3. 758754 4. 018289
Center X	49 110	01 18	39. 597 14. 031	18 122	$\frac{21}{30}$	51. 7 28. 9	198 302	20 27	34. 7 00. 6	Pugsley & Simpson	6, 584. 2 6, 638. 8	3. 818502 3. 822091
Hat	49 110	03 06	44. 208 31. 127	74 89	58 16	53, 5 56, 6	254 269	50 04	02. 7 37. 3	Center X Blacktail	14, 784. 4 19, 870. 4	4. 169803 4. 298206
Havre	48 110		46. 357 02. 685	99 121 121 177	29 25 46 26	48. 6 37. 5 04. 0 19. 8	279 301 301 357	19 16 33 25	20. 0 25. 6 23. 8 58. 3	Pugsley & Simpson Center X Blacktail Hat	17, 183. 8 17, 411. 4 24, 049. 1 12, 921. 0	4. 235120 4. 240833 4. 381098 4. 111297
CbeloTcbeloT	48 109	55 59	27. 263 25. 108	106 150	50 36	36. 5 54. 6	286 330	45 31	36. 8 33. 1	Havre	8, 452. 5 17, 625. 8	3. 926986 4. 246149
Day	49 109		44. 798 51. 422	2 34 89	11	16. 9 09. 0 10. 6	182 214 269	32 05 50	51. 4 43. 5 23. 3	Toledo Havre Hat	15, 384. 9 15, 617. 9 9, 332. 4	4. 187094 4. 193622 3. 969992
Center XI	49 109		17. 516 52. 547	40 118	26 11	00. 2 00. 1	220 298	20 05	18. 8 43. 9	Toledo	14, 204. 9 9, 647. 2	4. 152438 3. 984403
Willow Creek	49 109		08. 392 12. 144	32 78	07 48	46. 7 38. 0	212 258	05 40	00. 2 35. 0	Center XI Day	8, 419. 9 13, 229. 3	3. 925309 4. 121537
Chinook	48 109		42, 050 58, 389	80 134 150 178 259	41 36 47 58 52	09. 6 15. 4 50. 3 39. 9 31	260 314 330 358 79	32 28 44 58 52	31. 8 02. 6 53. 6 29. 5 31	Toledo Day Center XI Willow Creek Signal (U. S. C. & G. S.)	14, 166, 3 18, 620, 1 9, 750, 9 15, 644, 2 8, 03	4. 151256 4. 269983 3. 989046 4. 194354 0. 90472
Center XII	49 109	02 44	05, 743 24, 423	23 140	31 41	57. 7 39. 3	203 320	29 38	16. 3 47. 3	Chinook Willow Creek	10, 904. 6 7, 294. 5	4. 037608 3. 862994
Police	48 109		07. 126 14. 559	96 155	34 23	07. 9 26. 6	276 335	28 20	18. 1 18. 1	Chinook Center XII	9, 500. 6 12, 187. 5	3. 977753 4. 085916
Maple			30. 964 27. 018	7 35 48 86	09 27 53 42	44. 4 18. 4 28. 1 00. 5	187 215 228 266	08 20 48 34	23. 2 07. 0 58. 1 38. 2	Police Chinook Center XII Willow Creek	17, 554. 4 20, 043, 5 9, 635. 0 11, 892. 6	4. 244386 4. 301974 3. 983850 4. 075278

Station			le and cude	A	zimu	ith	Back	azi	muth	To station	Distance (meters)	Logarithm
Kirk		, 56 33	23. 224 28. 669			50. 8 09. 9			,, 44. 7 24. 7	PoliceMaple	8, 275. 5 17, 973. 8	3. 917792 4. 254640
Kirk north base	48 109	58 35	04. 536 54. 758	55 316		15. 1 47. 5	235 136		59. 2 37. 8	PoliceKirk	6, 410. 6 4, 316. 1	3, 806896 3, 635090
Kirk south base	48 109		21, 524 15, 033	85 165 268	51 45 35	29. 4 13. 0 57. 8	345	44	43. 6 43. 0 18. 1	Police_ Kirk north base Kirk	6, 112, 1 3, 283, 20 2, 165, 2	3. 786187 3. 516297 3. 335505
Fodd	49 109		59, 581 59, 486	7 34 109	20	09. 9 13. 2 09. 5	187 214 289	31		Kirk PoliceMaple	14, 213. 7 17, 727. 7 8, 355. 9	4. 152707 4. 248652 3. 921991
Center XIII	49 109	01 29	09. 161 55. 251		11 24	16. 4 25. 0	206	08	35. 4 51. 2	Kirk	9, 841. 5 5, 838. 0	3, 993062 3, 766265
Link	48 109		29.007	89 129	22 54	50. 1 23. 4		13	44. 7 58. 7	KirkCenter XIII	14, 720. 2 13, 505. 1	4. 167914 4. 130499
Shep			07. 098 41. 046	70 110 125 356	41 37 47 15	51. 9 38. 4 11. 3 55. 1		31 39	58. 2 25. 4 24. 4 06. 9	Kirk. Center XIII. Todd. Link.	15, 258. 3 10, 729. 2 15, 475. 5 4, 894. 1	4. 183505 4. 030569 4. 189645 3. 689670
Ryder	49 109		20. 175 36. 200	0 77 103	56 50	47. 3 31. 6 16. 0	180 257	56 44	43. 5 14. 7 25. 2	Shep	5, 965. 3 10, 372. 5 13, 022. 9	3. 775633 4. 015884 4. 114707
Forks (U. S. G. S.)	48 109	49 21	09. 958 26. 775	155 180		11. 9 11. 1	334		48. 6 12. 1	Center XIII	24, 510. 4 13, 562. 7	4. 389351 4. 132345
B18 (U. S. G. S.)			00. 367 39. 400	16 75 97	16 00 34	06. 1 37. 8 08. 8	196 254 277	12 56 24	29. 5 50. 1 08. 0	Forks_ Shep Center XIII	20, 926. 7 6, 349. 2 16, 312. 5	4. 320700 3. 802717 4. 212520
West Cherry (U. S. G. S.)	48 108		35. 306 44. 012	77 120	48 52	48. 5 17. 8	257 300	30 38	57. 2 01. 7	Forks	29, 692. 7 26, 887. 4	4, 472649 4, 429549
Strong	49 109	04 09	50. 177 21. 080	44 327	53 56	01. 2 45. 6	224 148		30. 2 31. 5	318 West Cherry	12, 625. 4 26, 763. 2	4, 101245 4, 427538
S-313	48 108		32, 081 56, 321	92 125 358	18 18 53	34. 8 49. 7 02. 2	272 305 178	10	27. 2 12. 6 11. 4	318 Strong West Cherry	22, 846. 3 17, 029. 5 12, 877. 1	4. 358816 4. 231201 4. 109819
Γubs	48 108	55 48	43. 932 59. 405	61 122	26 53	51. 7 22. 9	241 302	20 46	16.3 38.0	West Cherry	12, 169. 6 12, 998. 5	4. 085278 4. 113898
Rounds	49 108		18. 585 53. 821	0 28 57	27 32 38	49. 2 36. 7 51. 3	180 208 237	27 25 32	45. 0 56. 8 01. 8	Tubs_ West Cherry_ S-313_	14, 045, 4 22, 609, 4 13, 055, 2	4. 147534 4. 354289 4. 115782
Center XIV	49 108	00 38	05. 677 03. 384	58 114	51 20	17. 1 37. 2	238 294		02. 3 26. 1	Tubs Rounds	15, 602. 3 14, 495. 0	4, 193188 4, 161219
Murray	48 108		05. 664 33. 383	75 120 140	08 48 34	13. 3 22. 5 24. 6	254 300 320	38	05. 5 18. 3 31. 4	Tubs_ Rounds_ Center XIV	16, 974, 6 18, 921, 6 4, 800, 7	4, 229799 4, 276958 3, 681302
Telford	49 108		09. 455 57. 839	3 26 84	40 36 47	50. 4 18. 0 50. 8	183 206 264	40 33 37	23. 6 57. 9 19. 3	Murray Center XIV Rounds	11, 261. 3 8, 421. 1 17, 043. 7	4. 051589 3. 925370 4. 231564
Avery	48 108		57. 004 29. 531	83 127	22 09	09. 7 41. 3			48. 9 46. 9	MurrayTelford	13, 593. 1 16, 003. 0	4. 133317 4. 204201
Tees	49 108	03 23	09. 731 44. 810	6 56 97		36. 9 25. 9 39. 6	186 236 277	38 48 37	03. 1 31. 0 11. 1	Avery Murray Telford	7, 859. 8 17, 192. 3 13, 787. 4	3, 895414 4, 235335 4, 139482
Harding	49 108		42.067 37.832	45 97		33. 4 19. 1	225	45 46		Avery	9, 970. 6 6, 291. 9	3. 998722 3. 798780
Betts	48 108	58	10, 402 20, 662	100 144 177	54 34 37	09. 9 07. 3 14. 7	280 324 357			Avery	7, 638. 2 11, 353. 2 8, 399, 4	3. 882991 4. 055117 3. 924250
Raley	49 108	03 12	46, 994 06, 360	36 75		23. 4 43. 8	216 255	08	40. 9 48. 1	Betts Harding	12, 882. 6 8, 197. 7	4. 110004 3. 913690
White	48 108	57	27, 530 03, 160	99 140 179	49	30. 7 54. 3 56. 8	279 320 359	44 24	56. 4	Betts	7, 792. 1 12, 600. 1 11, 722. 4	3. 891655 4. 100374 4. 069018
Cole	49 108		51, 991 41, 004	40 89	43 11	21. 1 27. 7	-31	37	02. 0	WhiteRaley	15, 658, 5 10, 260, 0	4. 194750 4. 011147
Snow	48	55	49. 567 20. 987	104 141 173	23 09 46	27. 3 52. 7 46. 9	284 321 353	02	30.8	White Raley	12, 227, 0 18, 950, 2 14, 991, 4	4, 087320 4, 277613 4, 175842
Cory	49	03	44. 200 44. 443	44 90	04	23. 2 22. 9	223	55	37. 5	Snow	20, 382. 8 15, 766. 3	4. 309264 4. 197730

Station		tude and ngitude	A	zim	uth	Back	k az	imuth	To station	Distance (meters)	Logarithm
Kerr		, ,, 59 16, 478 50 39, 821	65 118 179	56 17 21	08. 2 11. 2 00. 1	° 245 298 359	47 07 20	21. 2	Snow	15, 630. 3 18, 008. 3 8, 270. 9	4. 193968 4. 255473 3. 917553
Center XV		00 00.742 47 06.328		32 19	05. 0 43. 6	252 327	29 16	23. 9 58. 8	Kerr_ Cory	4, 550. 3 8, 202. 6	3. 658041 3. 913950
Sowers	48 107	58 56, 328 45 41, 961	95 139 145	14	58. 7 56. 6 05. 1	275 319 325	13		KerrCenter XVCory	6, 088, 0 2, 627, 0 10, 809, 7	3. 784478 3. 419462 4. 033815
Sowers N. W. base	48 107	59 38, 781 48 49, 910	72 252 288	52 07 55	29. 6 49. 8 21. 7	252 72 108		08.0	Kerr_ Center XV_ Sowers	2, 338, 3 2, 212, 1 4, 040, 0	3. 368893 3. 344813 3. 606377
Sowers S. E. base		58 40. 967 48 20. 803			31. 2 11. 1 32. 5 31. 6	291 341 31 81	39 34	49. 1 28. 7	KerrSowers N. W. base Center XVSowers	3, 032. 1 1, 881. 47 2, 892. 4 3, 264. 6	3. 481738 3. 274497 3. 461251 3. 513829
Waters		04 08. 499 43 53. 214			53. 2 19. 6 16. 9	192 207 264	06	53.7	Sowers. Center XV Cory.	9, 893. 3 8, 600. 3 8, 381. 4	3. 995343 3. 934513 3. 923315
Dunbar	48 107	59 18.869 33 45.624	87 94 111 126		16. 2 39. 1 37. 8 05. 7	267 274 291 305	11 27 29 52	34. 8 48. 6	Sowers Center XV Cory Waters	14, 581. 3 16, 328. 4 22, 261. 9 15, 244. 6	4. 163795 4. 212943 4. 347562 4. 183116
Walsh		02 09. 981 30 33. 549	36 72 78 96	27 08 54 52	45. 9 26. 1 32. 1 40. 2	216 251 258 276	57 42		Dunbar Sowers Center XV Cory	6, 570. 8 19, 406. 2 20, 563. 3 24, 760. 2	3, 817619 4, 287940 4, 313093 4, 393754
Kennedy	48 107	55 40, 297 21 29, 540	114 137	20 28	52. 6 37. 6	294 317	11 21	37. 4 47. 1	Dunbar Walsh	16, 426. 1 16, 348. 4	4. 215535 4. 213475
French	49 107	00 48.847 20 44.709	5 80 101	28 08 53	08. 4 57. 2 40. 9	185 259 281	27 59 46	34. 6 07. 8 16. 3	Kennedy Dunbar Walsh	9, 575. 0 16, 114. 2 12, 222. 6	3. 981140 4. 207209 4. 087165
Long	48 107	57 24, 252 16 50, 739	60 143	31 03	$07.5 \\ 23.4$	240 323		37. 2 26. 8	Kennedy French	6, 519, 3 7, 910, 5	3. 814199 3. 898203
Moulstead		00 10.457 13 11.648	40 50 97 194	58 33 23 39	16. 4 40. 0 12. 3 14. 3	220 230 277 14	27	31. 1 24. 4 30. 3 42. 2	Long Kennedy French Blum	6, 797. 7 13, 122. 9 9, 283. 5 15, 688. 5	3. 832363 4. 118029 3. 967712 4. 195581
Lewis		54 43. 518 12 36. 785	99 133 175	14 52 59	30. 1 35. 9 12. 2	279 313 355	07 49 58	48. 5 24. 4 45. 9	Kennedy Long Moulstead	10, 987. 1 7, 167. 2 10, 124. 4	4. 040883 3. 855350 4. 005371
N, 286-A	49 (107 (00 03.789 08 44.973	25 92	30 12	36. 3 16. 2	205 272	27 08	41. 5 54. 9	Lewis	10, 960. 1 5, 424. 2	4. 039814 3. 734337
Grave		55 56.017 07 40.773	69 139 170	38 27 19	38. 0 51. 4 30. 6	249 319 350	34 23 18	54. 9 41. 8 42. 2	Lewis_ Moulstead_ N. 286-A	6, 428. 9 10, 347. 5 7, 764. 6	3. 808135 4. 014834 3. 890119
Alkali		00 35, 294 01 44, 531	40 83	$\frac{03}{32}$	40. 1 46. 8	219 263	59 27	11. 3 29. 4	Grave	11, 266. 0 8, 600. 2	4. 051770 3. 934511
Rabbit	48 3 106 3	58 13, 550 59 14, 673	67 106 145	37 25 11	55. 4 36. 8 09. 7	247 286 325	31 18 09	33. 6 26. 4 16. 6	Grave N. 286-A Alkali	11, 139. 1 12, 085. 0 5, 334. 3	4. 046851 4. 082247 3. 727078
S. 282-A		59 52, 439 53 06, 356	67 97	50 13	49. 9 08. 2			12. 0 37. 1	Rabbit Alkali	8, 087. 9 10, 614. 6	3. 907838 4. 025902
Sage		01 53. 244 52 06. 138	18 52 78	09 07 28	36. 7 14. 8 50. 0	198 232 258	08 01 21	51. 2 51. 2 33. 3	S. 282-A Rabbit Alkali	3, 927. 4 11, 042. 2 11, 995. 8	3. 594101 4. 043054 4. 079030
Creek		00 39. 511 48 42. 585	74 118	51 51	06. 0 54. 9	254 298	47 49	46. 9 21. 2	S. 282-A Sage	5, 554. 7 4, 721. 4	3. 744660 3. 674075
Hay-		58 12.803 17 06.714	112 138 156	51 14 44	52.4 37.1 21.5	292 318 336	47 10 43	21. 0 50. 9 09. 1	S. 282-A Sage Creek	7, 933. 8 9, 133. 1 4, 933. 4	3. 899484 3. 960618 3. 693146
Rocky		01 56, 907 46 03, 481	10 53 65 89	31 31 56 09	25. 9 45. 1 14. 3 29. 0	190 233 245 269	30 29 50 04	38. 2 45. 0 55. 2 55. 2	Hay Creek S. 282-A Sage	7, 041. 2 4, 020. 7 9, 413. 9 7, 367. 6	3, 847649 3, 604300 3, 973768 3, 867325
S. 280		59 52. 724 45 20. 464	34 167	59 10	54. 9 06. 6	214 347	58 09	34. 7 34. 1	Hay Rocky	3, 767. 6 3, 934. 5	3. 576068 3. 594895
Rocky Creek north base		01 02.786 48 08.249	236 302	34 23	43. 8 11. 4	56 122	36 25	18. 0 18. 0	Rocky S. 280	3, 036. 5 4, 038. 8	3. 482375 3. 606250
Rocky Creek south base		59 55. 282 17 39. 355	164 207 271	16 23 35	33. 1 48. 5 18. 5	344 27 91	16 25 37	11. 3 00. 9 03. 3	Rocky Creek north base Rocky	2, 166, 43 4, 232, 2 2, 824, 3	3. 335744 3. 626571 3. 450912

Station			le and tude	A	zimı	ith	Back	azi	muth	To station	Distance (meters)	Logarithm
Rocky Creek azimuth station	48	59	56. 982 43. 174	87 139 192 274	37 16	23. 0 35. 5 40. 0 51. 9	o 267 319 12 94		40. 6 31. 3 10. 0 54. 4	Rocky Creek south base Rocky Creek north base Rocky S. 280	1, 143. 2 2, 668. 6 3, 791. 5 1, 686. 3	3, 058114 3, 426291 3, 578809 3, 226947
Iron	48 106		04. 689 27. 487	76 107 133	25	17. 3 12. 0 54. 4	256 287 313	53 22 27	01. 4 16. 3 26. 1	Hay S. 280 Rocky	7, 082. 0 4, 963. 4 7, 730. 7	3. 850159 3. 695775 3. 888218
Smoky	49 106	01 38	20, 689 52, 868	36 60 71 97	48 00	46. 7 59. 2 24. 0 00. 7	216 239 250 277	46 54 55 14	50. 0 46. 5 31. 5 35. 6	Iron Hay S. 280 Rocky	5, 246. 6 11, 595. 8 8, 332. 3 8, 819. 1	3. 719876 4. 064302 3. 920764 3. 945426
Cone	48 106	57 35	58. 796 06. 898	104 143	46 39	29. 6 02. 6	284 323	41 36	42. 5 12. 1	IronSmoky	8, 002. 9 7, 745. 9	3. 903248 3. 889073
Burnt	49 106		40. 094 42. 625	30 74 99	29 36 30	57. 3 45. 3 09. 8	210 254 279	28 30 25	08. 4 09. 2 30. 3	Cone Iron Smoky	5, 782. 0 11, 068. 5 7, 626. 9	3. 762077 4. 044089 3. 882350
Gravel	48 106	57 32	37. 518 04. 063	100 172		31. 3 22. 9	280 352	00 04	13.3 53.8	ConeBurnt	3, 776. 8 5, 694. 3	3. 577118 3. 755440
N. 276	49 106		01. 319 04. 597	15 52 121	29	00. 5 33. 1 31. 4	195 232 301	13 26 00	15. 6 30. 1 17. 4	Gravel Cone Burnt	4, 603. 9 6, 212. 8 2, 324. 7	3. 663122 3. 793284 3. 366364
Mound	48 106	58 27	22. 372 29. 922	76 125		25. 0 34. 5	256 304	00 58	58. 1 52. 5	Gravel	5, 745, 5 5, 328, 5	3. 759331 3. 726609
Fox	48 106	59 26	11. 922 32. 001	37 105	34 25	58. 0 27. 1	217 285	$\frac{34}{22}$	$\frac{14.3}{01.4}$	Mound	1, 931. 4 5, 747. 8	3. 285863 3. 759503
Kid	48 106	57 25	19. 428 05. 874	93 123 153	35	07. 5 03. 5 30. 9	273 303 333	33	51. 9 14. 8 25. 9	Gravel Mound Fox	8, 525. 7 3, 516. 5 3, 891. 6	3. 930729 3. 546113 3. 590130
Badger	49 106	00 19	17. 762 21. 174	51 76		12. 6 15. 2	231 256	47 52	52. 5 50. 0	KidFox	8, 915. 0 8, 990. 9	3. 950123 3. 953801
Branch	48 106	58 17	08. 212 45. 621	80 100 154	28	38. 9 25. 1 57. 6	260 280 334	21	06. 8 47. 9 45. 5	Kid Fox Badger	9, 081. 4 10, 883. 5 4, 448. 6	3. 958151 4. 036768 3. 648225
Brace	49 106		25. 775 16. 917			35. 3 45. 0	214 251	46 11	57. 8 55. 3	BranchBadger	7, 432. 7 6, 529. 8	3. 871148 3. 814903
Coal	48 106	59 12	55. 162 27. 123	63 94 141	47	14. 2 08. 1 12. 7	242 274 321		13. 9 55. 6 49. 8	Branch Badger Brace	7, 270. 0 8, 444. 7 3, 579. 6	3. 861536 3. 926583 3. 553837
Slim	49 106	02 09	40. 772 58. 674	30 66		13. 0 52. 3	210 246		20. 9 37. 3	Coal Brace	5, 938. 8 5, 734. 3	3. 773699 3. 758482
Jeff			21. 876 49. 624	50 91 175	17	21. 6 54. 9 14. 9	230 271 355	03 14 41	22. 7 33. 1 08. 1	Coal Brace Slim	4, 173. 7 5, 431. 8 2, 444. 1	3. 620522 3. 734947 3. 388119
Windy	48 106	58 10	57. 329 19. 422	124 187		49. 8 15. 2	304 7	31 43	13. 4 37. 7	Coal	3, 151. 5 4, 506. 2	3. 498513 3. 653808
Kick	49 106	01 07	22. 722 10. 223	40 89 125	33		220 269 305	32 31 09	59. 2 15. 9 09. 4	Windy	5, 912. 7 3, 238. 6 4, 185. 8	3. 771788 3. 510363 3. 621778
Noon	48 106		05. 963 05. 739	86 141 178		44. 3 26. 6 53. 2	266 321 358		18. 1 22. 9 49. 8	Windy Jeff Kick	3, 947. 1 5, 359. 4 4, 225. 7	3. 596281 3. 729113 3. 625896
Bostick	48 106	58 03	02. 184 18. 203	113 142		17. 4 25. 3	293 322	02 41	25. 8 30. 2	Noon Kick	5, 029. 1 7, 786. 1	3. 701494 3. 891318
N. 268	49 106		18. 179 35. 535	11 67 109	55	18. 6 26. 8 09. 1	191 247 289	52	46. 4 02. 9 41. 7	Bostick Noon Kick	4, 289. 7 5, 928. 5 5, 927. 2	3. 632429 3. 772944 3. 772849
N. 267	49 105	00 58	10. 688 07. 526	57 92		09. 4 38. 7	237 272	49 24	15. 0 16. 4	Bostick N. 268	7, 460, 6 5, 452, 1	3. 872771 3. 736564
Green	48 105	58 57	21. 904 22. 313	85 119 164	27		265 299 344		07. 3 33. 0 49. 2	Bostick	7, 263, 8 7, 311, 2 3, 484, 0	3. 861165 3. 863989 3. 542072
Black=Green north base	48 105	59 56	44. 276 40. 908	18 114		39. 4 22. 8	198 294		08. 1 17. 4	Green N. 267	2, 680. 2 1, 940. 5	3. 428174 3. 287910
Green south base	48 105	58 56	57. 554 05. 155	54 132 153	15		234 312 333		38. 8 53. 2 53. 2	Green N. 267 Black=Green north base	1, 917. 0 3, 360. 5 1, 616. 02	3. 282613 3. 526398 3. 208446
Nick	48 105		46. 941 17. 046		09	40. 4 34. 5 17. 0	261 293 293		35. 3 00. 7 37. 8	Green Black = Green north base N. 267	5, 047. 3 4, 507. 3 6, 447. 2	3, 703062 3, 653920 3, 809371

Station			de and tude	A	zim	uth	Back	k azi	muth	To station	Distance (meters)	Logarithm
Sod	1000	00	77 16. 313 02. 434	6 77 88	08 27 25	33. 8 34. 1 37. 2	0 186 257 268	08 24	22. 7 49. 2 46. 9	Niek_ Black=Green north base N. 267	2, 776. 8 4, 549. 7 6, 203. 3	3, 443537 3, 657982 3, 792624
Mud	48 105	59 50	55. 787 15. 082	60 100	07 34	29. 9 35. 9	240 280	05 32	12. 6 29. 6	Nick	4, 267. 2 3, 460. 1	3. 630140 3. 539088
Child	48	57	19. 106 12. 593	107 123 134	29 20	31. 8 32. 0 29. 8	287 303 314	24 15	11. 6 22. 8 26. 9	Niek Sod Mud	9, 049. 5 9, 970. 9 6, 909. 6	3. 956623 3. 998735 3. 839453
Lost			12. 588 04. 647			01. 2	230 234	15 05	11. 5 52. 1 25. 8 13. 2	Child Mud Niek Sod	9, 067. 5 6, 614. 6 10, 843. 4 9, 217. 2	3. 957489 3. 820502 4. 035164 3. 964599
Harris	48 105		31, 596 54, 749	98	04 03 41	07. 4 53. 1 06. 7	185 278 357	$03 \\ 00 \\ 40$	53. 9 36. 7 59. 2	Child Mud Lost	4, 108. 9 5, 344. 6 4, 977. 3	3. 613723 3. 727911 3. 696998
Middle	49 105		48, 537 46, 484	50 72 108	25	55. 2 18. 5 47. 1	230 252 288	20	03. 8 40. 5 01. 5	Child Harris Lost	10, 172, 9 7, 853, 3 8, 109, 6	4. 007443 3. 895052 3. 909000
Fork	48 105	59 39		63 90 171	20	44. 3 05. 0 43. 8		43 15 14	39. 2 13. 3 30. 0	Child	9, 169. 0 7, 859. 1 2, 445. 7	3. 962320 3. 895374 3. 388396
Scobey	48 105	59 36	32. 871 15. 775	88 118	51 38	08. 9 50. 2	268 298	48 36	43. 6 11. 1	ForkMiddle	3, 912. 0 4, 879. 0	3. 592402 3. 688333
Poplar	49 105	01 35	20, 756 10, 112	21 56 79 186	58	44. 3 35. 4 43. 2 39	236		54. 7 20. 5 14. 5 39	Scobey Fork Middle Poplar (G. S. of C.)	3, 589. 9 6, 257. 0 5, 703. 1 6. 55	3. 555087 3. 796363 3. 756110 0. 8162
Break	48 105	59 35	30, 956 11, 704	92 180		32. 6 47. 5	272 0	35 32	44. 2 48. 7	Scobey Poplar	1, 303, 9 3, 392, 0	3, 115228 3, 530462
Knoll	49 105	01 33		25 41 94	20		221	19	40, 1 02, 3 39, 6	Break Scobey Poplar	3, 620. 2 4, 289. 9 1, 502. 4	3. 558732 3. 632451 3. 176775
Pole	48 105	58 31	56, 270 38, 536		54 14		283 327	51 12	52. 8 54. 2	Break Knoll	4, 464. 5 5, 175. 8	3. 649771 3. 713974
Din	49 105		48, 940 13, 475	63 104		$\frac{23.1}{02.8}$	243 284	31 43	23. 3 59. 9	Break Knoll	5, 408. 2 3, 422. 7	3, 733053 3, 534364
Coy	48 105		49. 540 00. 615	25 83 127 171	36 10	32. 2 13. 8	263	33 08	55. 1 22. 7 01. 2 32. 5	Pole	1, 817. 2 5, 136. 4 4, 481. 3 1, 853. 5	3. 259414 3. 710659 3. 651404 3. 267989
Nice	48 105	58 29	26, 904 25, 037	108 133 142 153	39	58.0 47.0			48. 9 33. 2 34. 9 49. 3	Pole Knoll Coy Din	2, 862. 3 7, 620. 9 3, 208. 3 4, 910. 3	3. 456709 3. 882007 3. 506269 3. 691111
Fee	49 105	01 25	09.605 19.783	44 84		34. 3 40. 1	224 264	44 53	29. 2 13. 1	Nice	7, 079. 2 7, 215. 1	3, 849987 3, 858243
Har	48 105	58 24	53. 426 28. 255	82 113 166	. 27	56.6	293	$\frac{14}{22}$	16.2 50.8 50.6	Nice Din Fee	6,090.5 8,976.7 4,335.2	3. 784651 3. 953116 3. 637009
Ray=Ogden N. W. base	49 105	$\frac{00}{22}$	07.013 13.677			29.7 52.0			48. 2 31. 5	Har	3, 557. 1 4, 247. 6	3. 551094 3. 628146
Fil	49 105		06. 694 54. 849	11 61 87 91	43 42 17 15	35. 5 17. 7 32. 5 31. 0	191 241 267 271	43 36 10 12	21. 3 38. 0 30. 9 56. 3	Ray=Ogden N. W. base Nice Din Fee	1, 882. 9 10, 397. 7 11, 364. 3 4, 164. 9	3. 274830 4. 016936 4. 055542 3. 619607
Ogden = Ogden S. E. base	48 105	59 21	19. 906 31. 696	77 80 103 149 171	10 23 09 36 53	53. 6 42. 1 16. 7 57. 0 03. 4	257 260 283 329 351	08 17 01	40. 4 45. 0 57. 7 25. 3 45. 9	Har Nice Din Ray=Ogden N. W. base	3, 681. 8 9, 763. 0 12, 140. 7 1, 686. 96 3, 332. 2	3. 566066 3. 989585 4. 084242 3. 227106 3. 522734
Neil	49 105	01 15		65 89	53 42	44. 5 29. 0	245 269		07. 4 34. 3	Ogden=Ogden S. E. base	8, 178. 0 7, 931. 0	3, 912647 3, 899328
Merril	48 105	58 14	56, 961	94 112 159	32 57 07	36. 7 52. 5 37. 3	274 292 339	52	02. 3 00. 5 39. 9	Ogden=Ogden S. E. base Fil. Neil.	9, 040. 1 10, 292. 5 4, 338. 7	3, 956173 4, 012520 3, 637357
Hearst	48 105	59 10	12. 737 08. 440	84 119		19.7	264 299		18. 6 11. 1	Merril	4, 904. 1 7, 347. 9	3. 690556 3. 866163
Spring	49 105		06. 419 55. 942	4 52 90	06	19. 1 00. 8 09. 9	184 232 270	02	09. 7 50. 2 01. 8	Hearst Merril Neil	3, 521. 0 6, 506. 4 6, 676. 5	3. 546666 3. 813343 3. 824549

APPENDIX V

Station			de and tude	A	zim	uth	Bac	k azi	muth	To station	Distance (meters)	Logarithm
Pull	49		17. 594 04. 325	61 113	51	29. 1 20. 4	o 241 293	, 49 22	10. 1 10. 8	HearstSpring	4, 245. 2 3, 799. 7	3. 627898 3. 579747
Pebble	48 105	58 05	59. 078 45. 466	94 127 146	43	22. 3 06. 2 45. 9	274 307 326	29 39 31	03. 9 57. 2 46. 5	Hearst	5, 363. 5 6, 433. 8 2, 907. 4	3. 729446 3. 808469 3. 463499
Fire	48 105	58 04	56, 830 56, 906	94 133		43. 8 21. 5	274 313		07. 2 45. 4	Pebble Pull	989. 8 3, 596. 4	2. 995559 3. 555868
Beaver	48 105	58 02	47. 313 32. 607	95 116		12. 2 01. 6	275 296	42 45	23. 3 36. 6	FirePull	2, 948. 8 6, 187. 9	3. 469652 3. 791546
Mervin	49 105		59. 671 27. 282	1 28 35 60 79 189	50 46	38. 2 43. 2 54. 8 19. 5 59. 2 25	181 208 215 240 259 9	42	34. 2 50. 3 25. 2 50. 4 20. 5 25	Beaver. Fire. Pebble. Pull. Spring Mervin (G. S. of C.)	5, 943. 2 6, 414. 8 6, 880. 8 6, 452. 1 9, 262. 1 3. 30	3. 774022 3. 807181 3. 837637 3. 809702 3. 966708 0. 5190
Robinson	48 104		56. 269 01. 269	88 125	03 52	00. 1 38. 1	267 305	58 47	04. 8 46. 8	Beaver Mervin	7, 962, 2 9, 676, 9	3. 901035 3. 985736
Pasture	104		58, 646 38, 825	4 54 90	56		184 234 270	51	34. 8 19. 7 33. 1	Robinson Beaver Mervin	5, 652, 4 10, 278, 9 8, 296, 9	3. 752231 4. 011945 3. 918917
Giles	49 104	02 50	13. 060 30. 650	47 85		46. 1 48. 3	227 265	49 53	36. 5 55. 6	Robinson Pasture	9, 061. 0 6, 275. 4	3. 957174 3. 797644
Zemper	48 104	59 47	50. 317 20. 080	81 111 138	24	00. 3 58. 7 56. 9	260 291 318	18	27. 0 42. 2 33. 0	Robinson Pasture Giles	10, 726, 7 10, 882, 3 5, 868, 5	4. 030465 4. 036720 3. 768524
Look	49 104	00 47	21, 752 03, 075	19 129	35 12	36. 3 45. 9	199 309	35 10	23. 5 09. 2	ZemperGiles	1, 030. 8 5, 441. 5	3. 013159 3. 735717
Carlisle	49 104	02 46	20, 149 33, 154	9 87	26 25	23. 2 32. 4	189 267	26 22	00. 6 33. 1	Look_ Giles	3, 707. 7 4, 828. 7	3, 569101 3, 683827
Johnson	48 104	59 45	50. 465 35. 413	89 118 126 165	19	13. 9 10. 4 14. 3 08. 4	269 298 306 345	51 28 15 45	54. 9 04. 2 31. 4 24. 8	Zemper Look Giles Carlisle	2, 127. 6 2, 027. 0 7, 442. 6 4, 770. 5	3. 327885 3. 306857 3. 871722 3. 678565
Out	49 104	00 43	01. 078 40. 016	82 140		19. 0 22. 9	262 320	01 40	51. 9 12. 2	Johnson Carlisle	2, 368. 4 5, 552. 6	3. 374456 3. 744500
Lump		01 42	23, 776 58, 308	18 47 111	21 56 46	31. 4 19. 8 33. 6	198 227 291	20 54 43	59. 9 21. 2 51. 4	Out Johnson Carlisle	2, 691. 6 4, 301. 4 4, 698. 9	3. 430011 3. 633610 3. 671994
Guard	48 104	59 39	58. 130 59. 921	91 126	11 08	21. 4 31. 9	271 306	08 06	35. 2 17. 2	Out	4, 474. 6 4, 487. 9	3. 650757 3. 652044
Rose	49 104		03. 044 39. 968	5 52 73	20	59. 0 25. 8 55. 6	185 232 253	59 17 13	43. 9 24. 5 25. 8	Guard Out Lump	3, 880. 0 6, 163. 3 4, 207. 8	3, 588836 3, 789814 3, 624056
Rood	49 104	02 37	09. 442 36. 580	35 85		35. 6 12. 4	215 265	39 28	47. 4 39. 2	GuardRose	4, 993. 8 2, 514. 0	3, 698428 3, 400370
In	49 104	00 37	10. 049 59. 089	81 187	29 03	11.6 57.0	261 7	27 04	40. 4 14. 0	GuardRood	2, 483, 4 3, 716, 5	3. 395055 3. 570135
Fly			09, 892 40, 680	90	06 44	57. 2 48. 7 19. 3 20. 1	270	05	41. 6 04. 3 18. 7 52. 6	Guard In Rose Rood	5, 281. 8 2, 813. 1 5, 988. 1 4, 380. 0	3. 722778 3. 449192 3. 777289 3. 641477
Berry	48 104		31. 929 16. 192	104 124 140	20	31. 9 07. 6 48. 1		32 19 03	43. 7 03. 9 16. 9	In Fly Rood	4, 681. 4 2, 079. 6 6, 344. 9	3. 670373 3. 317979 3. 802422
Wild	49 104	01 33	22. 868 30. 014	15 49 67 106	19 40 39 03	08, 6 52, 6 55, 1 08, 0	195 229 247 286	39 36	33. 7 13. 9 32. 0 01. 8	Berry Fly In Rood	3, 553. 3 3, 483. 2 5, 912. 5 5, 211. 3	3. 550627 3. 541976 3. 771769 3. 716946
View	48 104	58 30	49. 079 18. 754	105 140	21 43	30. 7 38. 4	285 320		31. 5 14. 1	BerryWild	5, 005. 7 6, 138. 6	3. 699468 3. 788071
Man	49 104	01 29	32, 788 04, 270	16 59 86	32	21. 7 08. 4 45. 1	196 239 266	39 28 43	25. 5 12. 9 24. 5	View Berry Wild	5, 279. 0 7, 356. 8 5, 407. 6	3.722550 3.866689 3.733006
White	49 104	00 25	35. 243 31. 962	60 112	40 25	14. 3 05. 2	240 292	36 22	37. 9 24. 9	View Man	6, 689, 1 4, 665, 8	3.825367 3.668926
Chap	48 104	58 25	26. 072 19. 340	96 141 176	41 37 19	21. 2 17. 0 18. 4	276 321 356	34	35. 3 27. 3 08. 9	View Man White	6, 130. 1 7, 360. 2 3, 998. 5	3.787466 3.866891 3.601901
Thompson	49 104		17. 856 17. 750	60 94	38 50	37. 3 26. 1	240 274	34 46	49. 7 28. 9	ChapWhite	7, 037. 0 6, 408. 3	3. 847388 3. 806746

Station			le and tude	A	zimu	ith	Back	c azi	muth	To station	Distance (meters)	Logarithm
Blondie	48		08. 528 30. 077	94 121 166	23	58. 6 18. 4 04. 7			35. 1 45. 4 28. 8	Chap	7, 123, 9 8, 641, 3 4, 111, 1	3.852717 3.936577 3.613953
High	49 104	00 15	36, 380 41, 488	45 84	31 12	14. 2 32. 9	225 264	28 09	21. 7 04. 4	Blondie Thompson	6, 516, 0 5, 643, 6	3.813983 3.751555
Round	48 104		10. 973 05. 903	70 108 164	16 05 40	29. 4 05. 0 19. 8	250 288 344	13 01 39	10. 1 09. 7 52. 9	Blondie Thompson High	5, 707. 9 6, 667. 4 2, 735. 7	3.756475 3.823957 3.437071
Cut	48 104	59 13	26. 205 12. 540	72 78 125	40 28 37	54. 7 22. 7 11. 4	252 258 305	36 26 35	09.8 57.2 19.0	Blondie Round High	8, 043, 2 2, 352, 3 3, 723, 6	3.905431 3.371492 3.570964
Mon. 579	48 104	59 10	59. 464 12. 812	74 99	18 43	43. 2 20. 5	254 279	16 39	$27.6 \\ 12.4$	CutHigh	3, 795. 2 6, 776. 7	3.579240 3.831018
Knute	48 104	57 10	27. 450 03. 617	96 117 130 133 177	20 30 23 41 43	37. 4 51. 7 06. 6 44. 9 14. 6	276 297 310 313 357	27 18	30. 1 03. 7 51. 7 22. 4 07. 7	Blondie Round High Cut. Mon, 579	11, 592. 1 6, 929. 8 9, 014. 3 5, 312. 2 4, 699. 7	4.064161 3.840720 3.954932 3.725274 3.672066
Knute south base	48 104	57 09	35. 098 03. 364	79 162	05 26	48. 1 10. 6	259 342	05 25	02. 6 18. 2	Knute Mon. 579	1, 248. 3 4, 677. 9	3.096321 3.670054
Knute north base	48 104	58 08	18. 800 54. 911	7 *41 153	15 23 00	29. 6 15. 6 59. 3	187 221 333		23, 2 23, 8 00, 6	Knute south base Knute Mon, 579	1, 360, 91 2, 114, 1 3, 489, 8	3.133829 3.325119 3.542801
Finley	48 104	58 05	05. 327 25. 141	78 121	21 06	31. 0 43. 3	258 301		00. 9 06. 2	Knute Mon. 579	5, 784. 1 6, 829. 7	3.762238 3.834399
Deal		00 04	31. 250 08. 622	19 51 82	02 50 28	54. 4 54. 1 54. 3	199 231 262	46	56. 7 26. 2 19. 4	Finley Knute Mon. 579	4, 768. 7 9, 183. 6 7, 466. 8	3.678400 3.963011 3.873133
Fine	48 103	57 58	34, 317 03, 532	96 126	08 24	00. 1 08. 9	276 306		27. 0 33. 4	Finley Deal	9, 033, 7 9, 218, 4	3.95586 3.96465
Foster	49 103		19. 081 05. 271	13 67 92		30. 0 40. 7 46. 3	193 247 272	49	46.0 23.6 26.7	Fine Finley Deal	5, 225. 8 10, 971. 0 8, 612. 1	3.718156 4.040243 3.935100
Flew	49 103		01. 113 08. 759	61 94	46 25	41. 3 03. 9	241 274		28. 3 34. 8	FineFoster	9, 575, 9 7, 267, 4	3.98118 3.86137
Skermo	48 103	57 47	29. 830 38. 223	90 114 137		23. 2 06. 0 48. 0	270 294 317	19	31. 6 58. 2 09. 2	FineFosterFlew	12, 721, 3 12, 660, 1 6, 337, 9	4. 104533 4. 102433 3. 801943
Fled	49 103	00 46	06. 116 14. 644	19 72 88 91	24 03 32 48	07. 8 13. 3 59. 1 10. 5	199 251 268 271	23 54 29 39	17.1	Skermo Fine Flew Foster		3. 70912 4. 18064 3. 77671 4. 12155
Bowie (U. S. C. & G. S.)	48 103	59 44	55. 870 00. 917	44 96		45. 8 21. 8	224 276		01. 8 40. 9	Skermo Fled	6, 315. 0 2, 736, 5	3. 80037 3. 43718
Olsen		00 41	14. 878 56. 038	53 76		09. 9 14. 1	233 256		51. 7 39. 9	SkermoBowie	8, 626. 0 2, 605. 2	3, 93581 3, 41584
Brown			38. 745 36. 608	87 128 145 175	52 18	37. 3 19. 1 11. 8 08. 7		48 16		SkermoFled	7, 258. 6 5, 153. 1	3, 866956 3, 860856 3, 712066 3, 68478
Ruin	48 103		39. 275 30. 681	63 109 125	26	31. 3 53. 4 50. 7	243 289 305	22		Brown Bowie Olsen	4, 218. 5 7, 118. 7 5, 113. 9	3.62516 3.85240 3.70875
Gopher	48 103		57. 717 21. 804	4 42 96	43	37. 6 06. 4 51. 7	184 222 276	40		Ruin BrownOlsen	2, 429. 9 5, 841. 3 4, 386. 6	3.38558 3.76651 3.64212
Hagen	49 103		29. 323 51. 808	59 79		48. 3 21. 8	239 259		17. 9 58. 1	RuinGopher		3. 82022 3. 74614
Ledge	48 103		52.704 49.600	85 109 179	58	31.0	289	55	10. 4 05. 6 17. 2	Ruin Gopher Hagen	5, 887. 1	3, 75820 3, 76990 3, 47495
Custom	49 103		23. 305 33. 237	54 92						Ledge_ Hagen		3, 68799 3, 60636
Ambrose			45, 403 05, 753	92 124 169	57	35. 1 39. 5 09. 2		54	48.9	Ledge. Hagen. Custom	5, 605. 7	3. 65871 3. 74862 3. 48791
School=Ambrose N. E. base (U. S. C. & G. S.)	48 103		23, 575 10, 462	43 80 93 109 137	29 14 34	26. 6 52. 6 56. 6	260 273 289	25 03 31	56. 0 40. 6 24. 3	Bowie Hagen	5, 755. 0 18, 129. 0 6, 068. 8	3. 21197 3. 76004 4. 25837 3. 78310 3. 39744

APPENDIX V

Station			ide and itude	A	zim	uth	Bac	k az	imuth	To station	Distance (meters)	Logarithm
Jasper		53	27. 049 28. 411	55 186 214 228	56 23	22. 7 35. 9	335 6 34 48	27	06. 1 51. 3	Bowie Ruin Ledge School=Ambrose N. E. base	13, 229. 4 9, 716. 3 12, 196. 2 16, 716. 5	4, 121539 3, 987501 4, 086226 4, 223145
Ambrose S. W. base (U. S. C. & G. S.)	48 103		06. 622 01. 856	121 246		23. 2 22. 3	301 66	29 14		Bowie School=Ambrose N. E. base	9, 998. 1 10, 479. 18	3, 999917 4, 020327
Bilby	48 103		46. 831 51. 582	73 125 130 136 171 207	04 06 18 10 10 43	57. 5 13. 4 54. 6 34. 1 16. 7 56. 3	252 304 310 316 351 27	59 57 15 06 09 46	48. 6 46. 0 18. 4 33. 0	Jasper Bowie Ambrose S. W. base Ruin Ledge School=Ambrose N. E. base	8, 449. 2 16, 630. 1 6, 678. 1 9, 958. 5 7, 686. 5 9, 660. 5	3. 926818 4. 220895 3. 824650 3. 998192 3. 885729 3. 984999
Nat	48 103	59 27	05. 500 51. 099	77 109	14 05	19. 5 46. 4	257 289	12 04		Ambrose School=Ambrose N. E. base	2, 807. 5 1, 707. 4	3, 448316 3, 232341
Ambrose west base	48 103	57 29	21, 912 31, 965	165 212	05 39	01. 2 08. 0	345 32		35. 7 24. 1	AmbroseNat	2, 669, 2 3, 801, 1	3. 426374 3. 579907
Ambrose east base	48 103	57 27		84 130 178	53 14 23	35. 0 22. 2 37. 2	264 310 358	52 12 23	15. 8 37. 5 34. 1	Ambrose west base	2, 144, 95 3, 697, 5 3, 009, 8	3, 331417 3, 567911 3, 478541
Friess	49 103		52. 835 10. 121	14 41 77	06 35 33	20, 1 15, 0 33, 4	194 221 257	05 33 31	49. 2 44. 2 00. 1	Nat. School=Ambrose N. E. base Custom.	3, 418. 8 3, 685. 9 4, 227. 3	3. 533869 3. 566544 3. 626063
Wheat	49 103	00 25	36. 093 00. 697	51 101	$\frac{04}{08}$	53. 3 17. 5	231 281		44. 7 39. 9	NatFriess	4, 453. 1 2, 680. 4	3. 648661 3. 428202
Gubert	48 163	59 24	17. 367 36. 555	84 133 168	43 23 35	30. 3 29. 3 41. 2	264 313 348	41 21 35	03. 5 33. 5 23. 0	Nat	3, 972. 4 4, 294. 2 2, 481. 0	3. 599048 3. 632881 3. 394624
Bone	48 103	59 22	40. 017 28. 402	74 119	58 14	50. 9 54. 8	254 299	57 12	14. 2 59. 9	Gubert	2, 697. 6 3, 547. 2	3. 430983 3. 549884
Lister	49 103		46. 788 14. 488		51 37 46	28. 2 02. 1 44. 0	232 242 266		47. 2 44. 3 08. 0	Bone- Gubert- Wheat	3, 415, 1 6, 000, 4 5, 825, 6	3, 533400 3, 778183 3, 765340
Huso	48 103	58 19	42. 626 59. 050	100 120 175		53. 4 38. 2 28. 8		44 15 19	23. 9 45. 5 17. 1	Gubert Bone Lister	5, 743. 6 3, 516. 2 3, 848. 4	3. 759188 3. 546078 3. 585277
Hold	49 103		48, 051 40, 658	46 89	10 30	04. 8 28. 6	226 269	07 27	35. 1 47. 2	HusoLister	5, 592. 6 4, 345. 4	3, 747612 3, 638029
Bloom	48 103	59 16	09. 652 31. 791	78 123 176		58. 6 49. 6 29. 7	258 303 356	46 31 36	22. 2 01. 5 23. 0	Huso Lister Hold	4, 296. 2 5, 430. 9 3, 045. 0	3. 633084 3. 734869 3. 483594
Church	48 103	59 14	00. 456 35. 965	96 142		22. 3 06. 1	276 322	51 39	54. 9 32. 0	Bloom	2, 372. 1 4, 179. 9	3. 375133 3. 621165
Good			15. 270 38. 871	45 66 101	50	29. 2 52. 6 12. 4	225 246 281	47	00.8 56.7 09.9	Church Bloom Hold	3, 317. 7 5, 150. 5 5, 017. 0	3. 520842 3. 711851 3. 700443
Mouse	48 103	58 11	54. 071 56. 826	93 121 161		17. 1 28. 5 16. 4	273 301 341	21	17. 0 54. 3 44. 7	Church Hold. Good.	3, 241. 8 6, 759. 0 2, 650. 0	3. 510788 3. 829883 3. 423241
Bacon			11. 546 29. 468	84 107		26. 2 42. 7	$\frac{264}{287}$		04. 4 49. 2	Mouse Good	5, 462. 8 6, 590. 4	3. 737419 3. 818914
Hansen	49 103		27. 764 47. 543	19 65 86	54 18 56	08. 7 49. 1 34. 1	199 245 266	53 14 52	37. 1 55. 7 09. 0	Mouse Good	2, 504. 0 6, 921. 4 7, 150. 7	3. 398634 3. 840196 3. 854350
Feeney	48 103		01. 477 50. 508			10, 1 43, 2	273 306		24. 9 29. 6	BaconHansen	4, 462. 8 4, 478. 4	3. 649608 3. 651124
Burner		00 03	33. 419 34. 010	62	44 10 28	08. 6 15. 8 38. 3	242		56. 2 18. 2 12. 3	Feeney Bacon Hansen	2, 860. 0 5, 413. 3 3, 937. 0	3. 456359 3. 733465 3. 595165
fust	49 103	00	09. 297 37. 125	61 101		58. 6 42. 4		55 41	32. 7 28. 9	FeeneyBurner	4, 454. 8 3, 671. 4	3. 648823 3. 564837
Plow	48 102	58 59	38. 604 34. 867	97 126 155	08	01. 2 16. 1 38. 6	306	05	48. 3 15. 5 51. 6	Feeney Burner Just	5, 246. 1 6, 017. 8 3, 074. 3	3. 719835 3. 779441 3. 487743
Ross		00 55	00. 876 36. 265			26. 1 01. 6	242 272		26. 1 14. 6	Plow	5, 476. 4 6, 120. 7	3. 738496 3. 786800
Corn		58 55	12. 489 24. 251	119	35	14. 1 46. 9 42. 5	299		05. 0 50. 8 33. 4	Plow Just Ross	5, 160. 2 7, 313. 4 3, 357. 2	3. 712666 3. 864120 3. 525971
Ross west base			52. 744 35. 305			21. 4 27. 8			05. 9 21. 4	RossCorn	2, 422, 9 1, 906, 4	3. 384338 3. 280213

Station		itude ngitu	and ide	A	zimı	ıth	Bacl	k azi	muth	To station	Distance (meters)	Logarithm
Ross east base	48	58 8	52. 623 09. 538	0 13 90 165		11. 8 55. 2 04. 8	93 270 345	34 06 32	00. 7 50. 4 44. 6	Corn Ross west base Ross	1, 275. 4 1, 744. 00 2, 177. 4	3, 105644 3, 241547 3, 337929
Crosby 2		58 (51 8	01. 333 51. 368	94 128	34 56	23. 2 49. 4	274 308	31 53	42. 6 59. 7	CornRoss	4, 343. 5 5, 877. 7	3. 637840 3. 769210
Estevan	49 102	00 1 51 1	13. 774 13. 247	10 53 85		54. 4 30. 0 56. 3	190 233 265	43 41 42	25. 6 20. 6 37. 8	Crosby 2 Corn Ross	4, 164. 0 6, 331. 0 5, 360. 8	3. 619516 3. 801470 3. 729229
Center I			15. 177 24. 536	61 117	32 50	54. 8 36. 1	241 297	30 48	18. 7 28. 8	Crosby 2. Estevan.	4, 784. 8 3, 877. 9	3. 679862 3. 588599
Percee			55. 298 09. 780	59 60 81	10 14 33	34. 4 57. 4 58. 7	239 240 261	07 09 28	22, 1 09, 1 39, 1	Center I Crosby 2 Estevan	6, 031, 5 10, 813, 8 8, 700, 9	3. 780422 4. 033980 3. 939562
Columbus			25, 209 01, 282	85 106 177	38 06 52	16, 5 45, 7 00, 3	265 286 357	32 03 51	21. 9 27. 1 53. 9	Crosby 2_ Center I_ Percee_	9, 589, 2 5, 571, 1 4, 639, 7	3. 981780 3. 745944 3. 666491
Center II			52. 750 48. 148	28 139	48 21	41. 9 29. 8	208 319	47 20	46. 7 28. 2	Columbus Percee	3, 086. 1 2, 546. 7	3. 489412 3. 405985
Dunbar			33. 857 42. 623	52 71 96	56 24 59	45.8 25.3 00.3	232 251 276	53 22 55	30. 6 05. 3 38. 6	Columbus Center II Percee	6, 591. 3 3, 978. 9 5, 469. 2	3. 818972 3. 599758 3. 737924
Rival			27. 426 47. 995	89 118 164	$\frac{24}{23}$ 07	59. 7 08. 3 58. 0	269 298 344	21 20 07	03. 3 07. 1 16. 8	Columbus Center II Dunbar	6, 371. 6 5, 548. 8 4, 060. 5	3. 804249 3. 744195 3. 608578
Center III			56. 359 28. 139	45 106	59 21	57. 2 06. 5	225 286	58 18	$\frac{11.7}{39.7}$	Rival Dunbar	3, 954. 0 4, 119. 0	3. 597034 3. 614791
Grey	48 102	58 8 34 8	51. 830 59. 482	80 118 137	48 44 53	27. 9 00. 4 24. 0	260 298 317	45 40 52	35. 5 26. 8 17. 1	Rival Dunbar Center III	4, 707. 7 6, 562. 2 2, 687. 5	3. 672806 3. 817046 3. 429347
Pinto			55. 090 17. 426	12 55 84	39 41 21	30. 6 05. 0 57. 3	192 235 264	38 39 17	58. 8 26. 3 51. 8	Grey Center III Dunbar	3, 902. 4 3, 216. 9 6, 640. 9	3. 591328 3. 507434 3. 822226
Center IV			44. 541 17. 166	76 109	52 41	02. 9 01. 6	256 289		44. 6 15. 0	Grey Pinto	7, 147, 5 6, 479, 9	3. 854156 3. 811569
South Portal	48 102		06, 895 28, 556	99 126 161		42. 3 43. 8 44. 5	279 306 341	11	47. 4 20. 6 07. 8	Grey Pinto Center IV	8, 070. 3 8, 791. 8 3, 174. 2	3. 906890 3. 944079 3. 501636
Portal north base			18. 036 56. 790	255 297	49 24	20. 9 26. 1	75 117	$\frac{51}{27}$	21. 3 03. 2	Center IV South Portal	3, 346. 8 4, 770. 7	3. 524624 3. 678585
Portal south base			03, 643 02, 614	134 196 266	43 30 59	07. 2 35. 9 01. 0			41. 1 10. 2 12. 0	Portal north base Center IV South Portal	3, 266. 80 3, 251. 0 1, 915. 7	3. 514122 3. 512016 3. 282328
North Portal	49 102	00 3 28 0	30, 763 04, 678		$\frac{14}{54}$ $\frac{42}{42}$	11. 0 18. 1 14. 4	186 225 275	13 53 37	53. 0 23. 4 33. 1	South Portal Center IV Pinto	4, 470. 7 2, 051. 7 7, 611. 9	3. 650378 3. 312121 3. 881493
Center V	48 102		43. 963 99. 497	43 121	$\frac{20}{42}$	00. 2 33. 4	223 301	18 41	15. 3 06. 5	South Portal North Portal	4, 121. 5 2, 751. 5	3. 615051 3. 439573
Klitzke	48 102		09 . 586 20. 992		49	48. 7 26. 8 40. 9	269 313 322	$01 \\ 46 \\ 52$	41. 9 38. 0 19. 0	South Portal North Portal Center V	5, 035. 8 6, 300. 9 3, 656. 1	3. 702072 3. 799402 3. 563023
Bien			25. 968 15. 380	17 69 91	$\frac{34}{52}$ $\frac{28}{28}$	33. 4 56. 1 24. 2	197 249 271	50	43. 9 44. 7 45. 9	Klitzke Center V North Portal	4, 419, 2 3, 769, 4 5, 881, 3	3. 645344 3. 576276 3. 769471
Spy			01. 821 17. 009	58 81	21 23	25, 2 22, 9	238 261	16 18	05. 3 52. 4	Klitzke Bien	10, 129, 1 7, 366, 3	4. 005571 3. 867248
Flax			58, 355 35, 330	92 119 171	08 19 30	47. 1 05. 7 05. 4	272 299 351	$02 \\ 14 \\ 29$	55. 9 03. 8 33. 9	Klitzke Bien Spy	9, 477. 6 9, 324. 7 5, 730. 6	3. 976697 3. 969633 3. 758197
Minot			50. 577 24. 251	80 110	52 34	30. 8 52. 0	260 290	46 28	20. 4 10. 0	FlaxSpy	10, 116, 5 11, 563, 1	4. 005029 4. 063076
Lake			10. 004 16. 299	1 52 79	$\frac{30}{35}$ 12	13. 2 06. 3 07. 3	181 232 259	$\frac{30}{28} \\ 05$	07. 2 49. 8 19. 1	Minot Flax Spy	6, 162, 7 12, 779, 5 11, 184, 8	3. 789772 4. 106514 4. 048627
Pleasant			07. 092 28. 366	110 155	36 33	07. 3 29. 6	290 335	33 31	54. 6 22. 9	Minot Lake	3, 820. 8 8, 243. 7	3, 582160 3, 916124
Oxbow			42. 632 34. 807	9 41 100	17 17 39	28. 9 12. 8 59. 5	189 221 280		48. 5 19. 7 12. 3	Pleasant Minot Lake	6, 746. 8 7, 070. 8 4, 577. 9	3. 829097 3. 849469 3. 660669

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Station			de and tude	A	zimı	ıth	Back	k azi	muth	To station	Distance (meters)	Logarithm
Center VI		59 03	" 42, 335 09, 810			20. 1 48. 4		44	35. 5 44. 2	Pleasant Oxbow	4, 073. 6 4, 098. 0	3. 609973 3. 612569
Sherwood		57	52. 984 40. 365	-	23			20	40. 2 28. 5	Pleasant Center VI	4, 657. 9 3, 836. 5	3. 668190 3. 583939
Souris	49	01			00 33 25	39. 6 44. 9 15. 0	192 226 276		43. 6 41. 4 07. 2	SherwoodOxbow	6, 699. 9 4, 580. 2 5, 082. 1	3, 826071 3, 660880 3, 706042
Glen	49 101		29. 902 02. 102		25 31	39. 8 50. 7		20 27	39. 2 46. 0	SherwoodSouris	10, 509. 4 6, 586. 9	4. 021578 3. 818680
Sehool	48 101	57 54	57. 502 48, 038		05 56 30	22. 7 14. 9 23. 9	269 312 357	51	11. 6 59. 7 13. 3	SherwoodSourisGlen	8, 388. 0 9, 384. 6 6, 567. 6	3. 923658 3. 972416 3. 817404
Center VII	48 101		21, 785 03, 925	39 148	07 45	39. 0 39. 0	219 328	06 44	20. 4 09. 8	SchoolGlen	3, 355. 8 4, 629. 4	3. 525796 3. 665529
Cornduff	49 101		42, 518 09, 047		14 19	53. 4 05. 7	208 265	13 16	26. 7 09. 7	Center VIIGlen	4, 934. 7 4, 750. 6	3. 693258 3. 676749
Morse	48 101		04, 211 48, 642	87 131 176		14. 5 24. 2 58. 7	267 311 356	02	13. 7 42. 1 43. 3	School Center VII Cornduff	4, 873. 6 3, 648. 3 6, 756. 6	3. 687852 3. 562091 3. 829725
Center VIII	49 101		00. 181 08. 147	51 122		44. 2 47. 5	231 302		57. 8 45. 6	Morse_ Cornduff	5, 738. 8 5, 827. 2	3. 758823 3. 765462
Nelson	48 101	57 45	38. 979 23. 317	96 153	45 58	06. 6 01. 6		41 56	01. 2 42, 5	Morse Center VIII	6, 663. 1 4, 854. 9	3. 823674 3. 686180
Morse west base	48 101	57 49	57. 093 19. 940	96 215	57 09	26. 5 40. 0			19. 6 19. 5	Morse Center VIII	1, 817. 5 4, 651. 8	3. 259481 3. 667620
Morse east base	48 101	57 47	57, 181 36, 874	89 93 188	56 12 44		269 273 8	54 10 44	00.0	Morse west base Morse Center VIII	2, 096, 37 3, 906, 5 3, 844, 3	3. 321467 3. 591793 3. 584818
Lyall	49 101		43, 370 19, 773	0 34 89		49. 3 56. 1 24. 6	214	32 37 45		Nelson Center VIII Cornduff	7, 550. 0 3, 874. 4 7, 095. 3	3.877946 3.588205 3.850973
Coutts	48 101	57 39	57, 159 51, 352	85 136		49. 8 34. 9		12 16		Nelson Lyall	6, 775. 8 9, 664. 4	3, 830963 3, 985175
Fife			44, 045 31, 454	3 43 89	24	17. 8 42. 2 03. 5	183 223 269	20		CouttsNelson	7, 020. 6 10, 415. 1 7, 076. 0	3, 846372 4, 017664 3, 849785
Center IX	49 101	00 36	49.885 14.706	39 112	33 43	39, 8 56, 2	219 292	30 41		Coutts	6, 918. 8 4, 333. 4	3, 840032 3, 636833
Winter	49 101	02 35	14, 009 09, 376	27 35 80				02 48 06	43.4	Center IX	2, 918. 1 9, 788. 0 5, 403. 4	3, 465099 3, 990696 3, 732669
Simmons	48 101	58 34	33, 091 22, 846	80 133 151 172	16 43	05. 3 26. 3 35. 6 57. 5	260 313 331 352	42	33. 4 11, 2	Coutts Fife Center IX Winter	6, 772. 8 8, 610. 6 4, 798. 7 6, 889. 8	3. 830767 3. 935031 3. 681128 3. 838204
Cowan	49 101	01 29	42, 086 16, 547	46 97		14. 3 17. 0	226 277	48 47	23. 1 50. 6	Simmons	8, 535. 0 7, 234. 5	3. 931203 3. 859409
Mohall			57. 448 58. 909	136	30	18. 0 19. 0 40. 1		25	13. 6 39. 4 26. 8	Simmons Winter Cowan	6, 679. 6 10, 932. 3 6, 948. 7	3. 824752 4. 038711 3. 841905
Holly	48 101		47.715 44.157	92 137	43 00	16. 9 44. 9	272 316		19. 5 34. 1	MohallCowan	6, 409. 3 9, 903. 2	3.806811 3.995774
Winlaw	49 101	02 23	08. 275 38. 417	0 40 83	05	52. 9 16. 7 02. 3	180 220 263	01	48. 6 14. 9 47. 1	Holly Mohall Cowan	8, 050. 0 10, 123. 0 6, 916. 0	3.905796 4.005311 3.839855
Bake	48 101	58 18	53. 519 37. 072	72 134	00 31	08. 4 22. 4	251 314	56 27	16. 8 35. 0	HollyWinlaw	6, 567. 8 8, 584. 9	3, 817423 3, 933736
Fry			06, 861 19, 504		57 02 21	23. 6 49. 3 18. 6	184 226 286	58	10. 3 44. 3 17. 8	Bake Holly Winlaw	4, 134. 6 9, 022. 7 6, 750. 8	3. 616433 3. 955336 3. 829356
Center X	48 101		49. 155 45. 607		57 55	39. 0 48. 8	249 298		44. 3 07. 4	Bake	5, 009. 8 4, 965. 8	3, 699824 3, 695987
Audry	48 101	58 13	10. 298 02, 508	101 145		15. 6 34. 8	281 325		03. 1 17. 0	Bake Center X	6, 933. 5 3, 704. 1	3, 840954 3, 568686
Cantel	49 101	01 12	53. 074 51. 197	31	16	52. 6 59. 0 10. 9	181 211 257	15	44. 0 32. 6 03. 0	Audry Center X Fry	6, 885. 8 4, 478. 8 6, 821. 0	3. 837954 3. 651159 3. 833846

Station			de and itude	A	zim	uth	Bac	k az	imuth	To station	Distance (meters)	Logarithm
Center XI	48		58. 596	42	, 58	,, 57. 6	o 222	57		AudryCantel	4, 572, 0	3, 660104
Antler	101	97.	29. 249 07. 992	90	48 53	48. 8	320 270	47 50			4, 563. 5 4, 686. 5	3. 659300
	101	09	12. 111	155	21	03. 6	335	20	05. 4	Audry Center XI	3, 759. 5	3, 670849 3, 575128
Copley	49 101			29 92	55 37 04	54. 7	182 209 272	54 36 01	43.6	Antler Center XI Cantel	6, 789. 7 3, 870. 0 4, 798. 8	3. 831853 3. 587715 3. 681135
Center XII	49 101			39 138	36 07	19. 0 31. 3	219 318	34 05		AntlerCopley	4, 839, 5 4, 099, 0	3. 684802 3. 612677
Elva	49 101	01 04	45, 496 56, 118	35 90	20 45	42. 8 19. 0	215 270	19 42		Center XII	3, 664. 6 4, 855, 3	3. 564031 3. 686220
Loek	48 101	58 04	40, 055 52, 820	79 141 179	23 23 19	20. 6 49. 2 46. 0	259 321 359	20 22 19	28.0	Antler Center XII Elva	5, 365, 5 3, 505, 4 5, 729, 0	3. 729607 3. 544736 3. 758076
Center XIII	49 101			33 129	24 53	23. 2 06. 9	213 309	22 51		LockElva	4, 382: 3 3, 228: 5	3. 641704 3. 509005
Holt	48 101		23, 303 36, 988	97 159	25 24	21. 3 59. 3	277 339	22 24		LockCenter XIII	4, 015. 9 4, 461. 2	3. 603784 3. 649453
Manor	49 101		27. 244 31. 057	1 48 97	12 16 43	57. 4 53. 9 39. 9	181 228 277	12 15 41	51. 2	Holt Center XIII Elva	5, 683. 5 2, 262. 7 4, 203. 9	3. 754617 3. 354633 3. 623648
Hope	48 100		10. 823 49. 749	92 126	42 41	27. 0 04. 2	272 306	37 36	19.8 01.4	Holt Manor	8, 291. 3 10, 166. 8	3. 918623 4. 007183
Smart	49 100	02 53		11 53 79	51 00 33	58. 7 12. 3 58. 7	191 232 259	50 54 27	57. 2 03. 4 54. 2	Hope	8, 054. 2 12, 443. 3 9, 972. 4	3. 906024 4. 094936 3. 998798
Center XV	48 100	59 52	45. 698 32. 979	43 167	30 12	41. 5 41. 5	223 347	28 11	58.3 59.8	HopeSmart	4, 040. 2 5, 077. 6	3. 606408 3. 705659
Sween	48 100	58 50	04. 044 04. 058	92 136	05 03	39. 0 26. 9	272 316	02 01	03. 5 34. 6	Hope Center XV	5, 814. 4 4, 362. 4	3. 764507 3. 639726
Smith	49 100		46, 291 29, 526	5 44 45 104	50 23 02 12	27. 8 35. 1 21. 8 46. 3	185 224 225 284	50 19 00 09	01. 7 33. 4 03. 3 46. 0	Sween Hope Center XV Smart	6, 901. 4 9, 309. 7 5, 270. 2 5, 002. 9	3. 838935 3. 968936 3. 721830 3. 699225
Center XVI	48 100	59 46	54. 902 43. 990	49 135	55 40	44. 7 03. 4	229 315	53 37	13. 7 58. 4	SweenSmith	5, 317. 5 4, 812. 0	3. 725710 3. 682326
Mouse	48 100	58 45	21. 322 11. 477	84 146	54 57	18. 1 30. 0	264 326	50 56	37. 4 20. 2	Sween Center XVI	5, 974. 5 3, 448. 9	3. 776302 3. 537682
Good	49 100	01 45	31. 276 03. 399	1 34 94	36 29 55	13. 4 05. 1 53. 8	181 214 274	36 27 52	07. 3 49. 2 32. 9	Mouse_ Center XVI Smith	5, 870. 3 3, 611. 4 5, 426. 3	3. 768658 3. 557674 3. 734501
Knoll	49 100		29. 666 05. 859	51 90	58 25	53. 3 47. 1	231 270	54 21	17. 4 17. 2	Mouse Good	9, 438. 4 7, 263. 9	3. 974898 3. 861171
Steele	48 100	58 39	28. 111 03. 296	88 127 179	26 44 28	03. 1 35. 0 05. 2	268 307 359	21 40 28	25. 4 03. 3 03. 3	Mouse Good Knoll	7, 490. 6 9, 251. 5 5, 608. 8	3. 874517 3. 966214 3. 748867
Turtle	49 100		35. 083 56. 644	52 78	24 33	13. 2 22. 2	232 258	18 27	05. 8 12. 8	Steele Knoll Knoll	12, 490. 8 10, 140. 5	4. 096589 4. 006059
Bottineau	48 100	59 30	57, 767 45, 163	74 105 177	45 38 15	27. 9 32. 8 11. 1	254 285 357	39 32 15	12. 0 14. 9 02. 5	Steele Knoll Turtle	10, 499. 6 10, 563. 4 4, 865. 4	4. 021174 4. 023803 3. 687116
Steele 2	48 100	58 39	28, 987 06, 299	180 254	05 52	30. 5 56. 0	0 74	05 59	30. 8 14. 1	KnollBottineau	5, 581. 5 10, 551. 5	3. 746748 4. 023313
Rock	48 100	58 37	43. 195 26. 632	77 158 254	47 35 11	30. 9 46. 3 49. 3	257 338 74	46 34 16	15. 7 31. 4 52. 2	Steele 2. Knoll Bottineau.	2, 073. 8 5, 523. 9 8, 481, 0	3. 316760 3. 742246 3. 928446
Souris west base	48 100	59 40	42. 717 42. 373	210 319	41 22	09. 2 18. 6	30 139	42 23	22. 0 31. 1	KnollSteele 2	3, 842. 2 3, 000. 5	3. 584577 3. 477199
Souris east base	48 100	59 38	42. 522 48. 001	9 90 173 317	18 09 44 55	11. 1 35. 3 41. 0 10. 9	189 270 353 137	17 08 44 56	57. 3 09. 0 27. 5 12. 4	Steele 2 Souris west base Knoll Rock	2, 301. 9 2, 324. 96 3, 329. 7 2, 468. 9	3. 362080 3. 366416 3. 522402 3. 392512
Center XVII	49 100	00 26	44. 021 20. 599	75 121	08 29	44. 9 14. 6	255 301	05 25	25. 2 46. 2	Bottineau Turtle	5, 563. 6 6, 574. 1	3. 745353 3. 817837
Summit	48 100		57. 764 46. 503	90 127 154	01 40 08	55. 4 25. 1 00. 4	269 307 334	58 36 07	10. 0 31. 0 34. 7	Bottineau Turtle Center XVII	6, 070. 7 7, 957. 7 1, 588. 1	3. 783237 3. 900786 3. 200882

Station			le and tude	Az	zimu	ith	Back	azi	muth	To station	Distance (meters)	Logarithm
Bois	49 100	01	16. 596 37. 960	29 64 107	46 15 32	33. 8 10. 7 04. 8	209 244 287	45 13	42. 0 53. 2 18. 8	Summit Center XVII Turtle	2, 805. 5 2, 315. 6 8, 065. 3	3. 448008 3. 364669 3. 906621
Fish	49 100	00 19	38. 242 32. 359	80 100	42 50	04. 2 04. 3	260 280	37 46	21. 8 13. 6	SummitBois	7, 706. 3 6, 321. 7	3. 886844 3. 800837
Field	48 100	58 18	06. 534 43. 325	111 129 167		48. 0 51. 5 46. 8	291		28.7 23.9 09.8	Summit	9, 265, 1 9, 297, 6 4, 791, 4	3. 966849 3. 968369 3. 680459
Ack	48 100	57 13	52, 364 49, 943	94 126	13 23	34. 5 28. 1	274 306	09 19	53. 2 09. 7	FieldFish	5, 983. 3 8, 644. 3	3, 776943 3, 936728
Fair	49 100		37. 074	7 46 76	14 29 59	15. 1 49. 2 09. 2	187 226 256	13 25 54	42. 4 35. 1 18. 0	Ack Field Fish	6, 997. 3 9, 441. 8 8, 045. 9	3. 844931 3. 975057 3. 905574
Worth	48 100	59 02	13. 410 04. 844	80 108	10 19	10.7 52.9	260 288	01 11	18. 8 33. 4	AckFair	14, 555. 8 14, 162. 5	4. 163037 4. 151139
Ninga		01	51. 470 58. 012	27 66 88	50 29 29	32. 0 32. 1 33. 2	207 246 268	48 19 19	56. 3 04. 3 37. 8	Worth Ack Fair	5, 521. 3 18, 453. 5 16, 025. 9	3.742039 4.266078 4.204823
Center XIX	49 99	00 57	24. 425 59. 242	66 138	18 06	17. 0 22. 8	246 318		11. 7 53. 2	Worth Ninga	5, 453. 1 3, 613. 1	3. 736646 3. 557879
Center XX	49 99		08. 581 06. 104	82 93 106		57. 5 44. 6 35. 7	262 273 286		40. 4 32. 7 54. 1	Worth	13, 499. 0 8, 411. 0 11, 265. 7	4. 130303 3. 924847 4. 051758
St. Johns		59 48	23, 568 57, 402	88 99 108 118	57 44 51 00		268 279 288 297	47 37 43 58	40. 9 46. 6 33. 2 38. 0	Worth	16, 012. 4 11, 173. 2 14, 181. 1 2, 962. 8	4. 204457 4. 048177 4. 151709 3. 471702
Bannerman			52. 568 21. 707	6 33 68 82	24 24 45 28		186 213 248 262	37	20. 5 46. 8 51. 2 31. 1	St. Johns Center XX Center XIX Ninga	6, 496, 9 6, 067, 7 12, 593, 6 14, 267, 4	3.812708 3.783025 4.100149 4.154346
Bannerman north base	49 99		07. 207 53, 345	14 46	26 55	48.7 27.7	194 226	26 53	00. 4 02. 2	St. Johns		3. 717667 3. 729457
East	49 99		22, 569 25, 710	29 54 75 111	04		209 233 255 291		15.3 13.7 44.9 44.0	St. Johns	6, 330. 7 7, 041. 8 1, 842. 1 2, 531. 4	3. 801451 3. 847684 3. 265317 3. 403364
Bannerman south base			32. 489 44. 792	61 83 138 166	28	56. 8 53. 4 38. 5	241 263 318 346	26 30 14 15	31. 4 50. 9 01. 4	St. Johns Center XX Bannerman north base East		3. 648994 3. 817692 3. 593523 3. 544154
Center XXI	49 99		24. 664 54. 921	75 130			255 310	35 21	41. 3 32. 0	St. Johns East	7, 606. 0 5, 622. 0	3.881156 3.749888
Rolla	48 99	58 40		94 133		11.8 32.6	274 313		53. 1 47. 4	St. Johns Center XXI	10, 234. 1 3, 900. 7	4. 010050 3. 591145
Lena		01 40	57, 507 35, 176	0 44 65 96	43	34.0	180 224 244 276	41		Rolla Center XXI St. Johns East	5, 549. 6 4, 035. 8 11, 259. 5 7, 161. 8	3, 744262 3, 605933 4, 051520 3, 855023
Center XXII	48 99		59. 790 37. 905	62		28.5	242	04	14. 5 12. 4	RollaLena.	4, 087. 2 5, 118. 4	3. 611421 3. 709137
Enter	49 99	01 35	43.792	38 93	49	35. 8 02. 8	218 273	47 53	59. 8 12. 9	Center XXII	4, 123. 2 6, 199. 0	3. 615233 3. 792322
Prise	48 99	58 34	43. 759	93 120 166		05. 5 26. 6 42. 4	273 300 346		24. 8 59. 9 51. 7	Rolla Center XXII Enter	7, 575. 6 4, 595. 4 5, 726. 3	3. 879415 3. 662325 3. 757871
Center XXIII	48 99	59 32		46 130	28 58	22. 8 13. 2	226 310	26 55	53. 4 53. 1	PriseEnter	3, 322. 9 4, 993. 0	3. 521515 3. 698365
Home	49 99	02 28	08. 289 57. 281	46 84	22 37	12.8 55.4	226 264	19 32	35. 9 58. 3	Center XXIII	5, 837. 2 8, 027. 8	3.766206 3.904594
Field	48 99	58 28	55. 448 19. 232	87 111 120 172	14 06 42 36	54, 4 51, 4 48, 2 29, 8	267 291 300 352		19. 5 45. 8 22. 5 01. 1	PriseCenter XXIIIEnterHome	7, 418. 3 5, 358. 2 10, 195. 6 6, 007. 2	3.870305 3.729017 4.008413 3.778669
Hans	48 99	58 20	35. 090 38. 472	93 123	53 03	16.5 44.5	273 302	47	28. 9 28. 1	FieldHome	9, 390. 5 12, 089. 2	3, 972687 4, 082396
Wright	49 99	02 19	06. 480	7 59 90	04 56	30, 9 11, 9 56, 0	187 239	04 49	00.8 54.1	Hans	6, 580. 2 11, 761. 5 10, 941. 4	3. 818240 4. 070463 4. 039072

Station		tude and ngitude	A	zim	uth	Bac	k az	imuth	To station	Distance (meters)	Logarithm
Clear	49	, ,, 02 04.65 11 49.60				o 238 270	53 16	03. 7 24. 0	Hans Wright	12, 547. 7 9, 933. 0	4. 098566 3. 997082
Ridge	48 99	58 45. 94 10 46. 98	88 118 168	58		268 298 348	20 51 16	26. 8 56. 1 51. 4	Hans	12, 032, 7 12, 808, 6 6, 269, 0	4. 080363 4. 107503 3. 797200
Wills		01 44.389 06 32.16				223 275	11 30	13. 5 45. 7	Ridge	7, 563. 6 6, 478. 4	3. 878729 3. 811469
Mott		58 16.42 04 20.80		44	54. 2	276 307 337	39	57. 7 15. 5 04. 7	Ridge Clear Wills	7, 906. 0 11, 528. 7 6, 957. 0	3. 897959 4. 061782 3. 842422
Center XXIV		00 55.47 04 39.78		30	30.8	303 175	29	06.0	Wills Mott	2, 738. 0 4, 928. 3	3. 437431 3. 692700
Sarles		58 21.33 58 45.17				268 303	41 24	31. 2 31. 7	MottCenter XXIV	6, 827. 6 8, 639. 3	3. 834268 3. 936479
Crystal.		01 54, 13 58 27, 80		53 33	23. 4 17. 1	183 226 256 268		23. 2 57. 0 36. 3 46. 8	Sarles	6, 583. 2 9, 834. 2 7, 771. 6 9, 843. 8	3. 818435 3. 992739 3. 890511 3. 993165
City		02 16. 02 53 46, 55				219 263			SarlesCrystal	9, 455. 0 5, 752. 6	3. 975660 3. 759861
Badger		58 04.71 53 29.15		27	02.1	274 319 357	32 23 23	01, 8 16, 6 26, 4	Sarles_ Crystal City	6, 447. 7 9, 331. 4 7, 771. 4	3. 809403 3. 969946 3. 890498
Center XXV		00 35, 97 49 28, 37			31. 4 07. 0	226 300	18 28	29. 7 52. 1	BadgerCity	6, 767. 4 6, 088. 2	3. 830419 3. 784488
Star		03 34, 54 43 26, 19		10	22.1	230 233 259	11 05 02		Badger Center XXV City	15, 935. 5 9, 195. 1 12, 828. 6	4. 202366 3. 963557 4. 108180
Hannah		00 00.45 43 10.40		10	09.2	254 278 357	04 05 13	16. 0 23. 9 19. 8	Badger Center XXV Star	13, 078. 9 7, 759. 8 6, 621. 6	4. 116573 3. 889849 3. 820960
Hannah north base		02 07.62 41 39.12				205 320		55. 7 26. 1	HannahStar	4, 344. 4 3, 455. 3	3. 637926 3. 538481
Hannah south base		00 37.72 41 38.36		09	39.9	238 338 359	22 08 40	45. 5 18. 5 53. 9	Hannah Star Hannah north base	2, 196. 7 5, 885. 2 2, 777. 10	3. 341774 3. 769758 3. 443592
Star Mound		03 34, 229 43 28, 270		20 43	17.0	76 140 157 176	57 22 44 51	29. 4 11. 4 40. 0 21. 9	Star Mound (G. S. of C.) Hannah north base Hannah south base Hannah	39. 87 3, 474. 4 5, 891. 9 6, 613. 9	1. 60066 3. 540879 3. 770254 3. 820457
Flake		01 10.123 33 28.423				259 290	37 06	31. 1 52. 8	HannahStar	12, 021. 4 12, 934. 6	4. 079956 4. 111753
Wales		57 50, 544 33 26, 702		. 09	39.3	288 311 359	37 02 40	11. 9 06. 8 28. 0	Hannah Star Flake	12, 528. 8 16, 166. 1 6, 165. 4	4. 097911 4. 208605 3. 789961
Bray		00 46, 082 25 48, 446			50. 3 28. 4	239 274	45 29	04. 5 41. 1	WalesFlake	10, 779. 9 9, 376. 0	4. 032616 3. 972019
Post		58 21, 793 24 10, 819	114	10 42 00	41. 3 08. 1 33. 2		35	41. 9 07. 2 19. 5	Wales Flake Bray	11, 347, 2 12, 470, 7 4, 879, 2	4. 054889 4. 095890 3. 688347
Windy		01 30, 877 21 04, 768		56 31	24. 2 46. 0	212 256	54 28	03. 8 11. 8	Post Bray	6, 958. 5 5, 927. 6	3. 842514 3. 772880
Gates		58 24. 107 19 06. 069			16. 1 28. 6 08. 0	269 298 337		26. 2 24. 9 38. 4	Post Bray_ Windy	6, 198. 1 9, 281. 5 6, 253. 8	3. 792262 3. 967617 3. 796144
Center XXVI		00 03.401 17 41.204	29 123		02. 4 36. 5	209 303		58. 3 02, 8	Gates Windy	3, 519. 3 4, 941. 0	3. 546458 3. 693818
North Pembina		01 56. 942 15 13. 923		29	19. 8 11. 9 28. 6	215 220 263	38 27 31	24. 6 20. 8 03. 7	Gates_ Center XXVI Windy	8, 092. 6 4, 610. 7 7, 172. 5	3. 908090 3. 663764 3. 855671
Church		56 54.781 13 15.069		10 49 08 29	00. 2 05. 2 24. 3 57. 0	291 311 317 345	05 43 05 28	35. 5 10. 9 03. 5 27. 3	Gates	7, 654. 7 12, 803. 9 7, 952. 5 9, 641. 9	3. 883927 4. 107342 3. 900505 3. 984162
Ice	49 (98]	02 43. 507 12 23. 149		36 29	02. 9 34. 2	185 247	35 27	23. 7 25. 2	ChurchNorth Pembina	10, 824. 2 3, 754. 9	4. 034397 3. 574600
South Pembina	49 0 98 1	00 00. 226 0 51. 889	26 124 159	07	30. 0 57. 1 37. 1		55 04 48	42. 0 39. 3 28. 2	ChurchNorth PembinaIce	6, 426. 2 6, 430. 3 5, 374. 0	3. 807953 3. 808232 3. 730297

Station			le and tude	A	zimı	ith	Back	c azi	muth	To station	Distance (meters)	Logarithm
Center XXVII		01 08	77 47, 980 06, 893	o 45 108	, 13 16	24. 0 02. 8		, 11 12	19. 4 49. 3	South Pembina	4, 724. 5 5, 480. 1	3. 674357 3. 738790
Oak	49 98	03 08	07. 393 00. 794	2 82	53 08	25. 8 29. 6	182 262	53 05	21. 2 11. 6	Center XXVII	2, 456. 3 5, 378. 3	3. 390290 3. 730644
Birch	49 98		11. 532 59. 142	85 155 167	48 12 01	06. 7 28. 5 26. 9	265 335 347	45 11 00	11. 0 37. 4 40. 4	South Pembina Center XXVII Oak	4, 743. 5 3, 282. 1 5, 575. 2	3. 676103 3. 516151 3. 746257
North Outlook	49 98	02 05	57. 954 31. 902	19 95	01 31	48. 4 28. 6	199 275	00 29	42. 5 36. 1	BirchOak	5, 438. 0 3, 037. 4	3, 735437 3, 482495
South Outlook	49 98	00 05	55. 788 30. 818	52 143 179	42 10 39	51. 8 14. 8 56. 7	232 323 359	41 08 39	45. 1 21. 5 55. 9	Birch Oak North Outlook	2, 256. 3 5, 080. 2 3, 774. 0	3. 353397 3. 705885 3. 576801
Haskett north base station	49 97	02 58	42. 019 59. 316	67 93	37 34	05. 4 28. 6	247 273	32 29	09. 8 32. 1	South OutlookNorth Outlook	8, 603. 4 7, 987. 4	3. 934668 3. 902405
Haskett south base station	49 97	00 57	21, 621 40, 800	88 96 116 159	29 21 49 48	07. 3 18. 1 33. 1 56. 6	268 276 296 339	22 15 43 47	05. 8 23. 3 37. 4 57. 3	Birch_ South Outlook_ North Outlook_ Haskett north base station_	11, 352. 2 9, 609. 7 10, 719. 8 4, 621. 17	4. 055078 3. 982711 4. 030188 3. 664752
Haskett north base mark	49 97	02 59	37. 023 16. 185	245	44	44.8	65	44	57. 5	Haskett north base station	375. 74	2, 574882
Haskett south base mark	49 97	00 57	20. 968 43. 003	155 245	45 45	43. 4 43. 7	335 65	44 45	33, 1 45, 3	Haskett north base mark Haskett south base station	4, 609. 64 49. 10	3. 663666 1. 691107
Wink	49 97	02 55	41.853 01.394	36 90	47 05	49. 1 08. 0	216 270	45 02	48. 8 08. 3	Haskett south base station Haskett north base station	5, 408. 7 4, 831. 7	3. 733093 3. 684098
Kloss	49 97	00 54	28. 737 39. 515	86 127 173	36 59 49	15. 5 05. 4 58. 9	266 307 353	33 55 49	58. 7 49. 3 42. 4	Haskett south base station Haskett north base station Wink	3, 690. 9 6, 694. 0 4, 136. 1	3. 567128 3. 825683 3. 616596
Center XXVIII	49 97	01 51	11. 184 50. 581	69 125	06 52	42. 7 24. 7	249 305	04 50	35. 1 00. 6	KlossWink	3, 674. 7 4, 782. 1	3. 565222 3. 679617
Rhine	49 97	02 50	41. 213 27. 042	31 90	23 13	52. 4 55. 7	211 270	22 10	49. 4 28. 5	Center XXVIII	3, 258. 0 5, 571. 5	3. 512947 3. 745972
Berg	49 97	00 50	28. 932 22. 055	89 125 178	57 58 34	39. 9 23. 6 48. 1	269 305 358	54 57 34	25. 6 16. 8 44. 3	Kloss Center XXVIII Rhine	5, 232. 3 2, 222. 5 4, 087. 7	3. 718692 3. 346848 3. 611474
Center XXIX	49 97	01 49	31. 038 05. 68 4	38 142	58 41	28. 1 25. 8	218 322	57 40	30. 5 24. 4	BergRhine	2, 467. 6 2, 725. 8	3. 392270 3. 435502
Plum	49 97	02 46	37. 952 49. 500	47 53 91	18 14 19	54. 5 40. 2 44. 5	227 233 271	16 12 17	14. 1 57. 4 00. 3	Berg Center XXIX Rhine	5, 876. 4 3, 453. 2 4, 419. 0	3. 769110 3. 538220 3. 645323
Wall	49 97	00 46	08. 565 30. 796	97 129 175	38 00 17	55. 3 20. 9 41. 7	277 308 355	36 58 17	00. 9 24. 1 27. 6	Berg Center XXIX Plum	4, 742. 0 4, 049. 3 4, 630. 4	3. 675958 3. 607380 3. 665621
Center XXX	49 97	01 45	25. 975 05. 602	35 136	54 30	43. 3 20. 3	215 316	53 29	39. 0 01. 9	WallPlum	2, 952. 2 3, 065. 6	3. 470147 3. 486511
Glen	49 97	$\frac{02}{42}$	04. 887 58. 411	65 102	03 18	49. 6 06. 7	245 282	02 15	13. 7 12. 5	Center XXX Plum	2, 849. 7 4, 803. 3	3. 454803 3. 681540
Cross	48 97		41. 557 28. 268		37 16 07	52. 2 06. 4 37. 3	315	14	49. 3 07. 7 14. 5	Wall Center XXX Glen_	4, 999. 9 4, 541. 8 4, 469. 9	3. 698962 3. 657230 3. 650296
Center XXXI	49 97	01 39	07. 258 40. 983	52 113		32. 9 19. 1	232 293	04 54	26. 6 50, 0	CrossGlen	4, 309. 0 4, 388. 2	3. 634379 3. 642282
Lowe	49 97		11. 045 19. 871	39 88	54 06	42. 3 12. 7	219 268		41. 1 42. 4	Center XXXI	2, 568. 6 5, 660. 8	3. 409701 3. 752877
Buy	49 97	00 38	03. 612 17. 443	82 139 179	24 11 16		262 319 359		43. 5 55. 0 54. 6	Cross Center XXXI Lowe	5, 143. 8 2, 597. 7 3, 936. 9	3. 711284 3. 414581 3. 595156
Center XXXII	49 97	01 36	09. 837 39. 170	44 132	19 45	12. 1 26. 0	224 312		57. 9 10. 0	Buy Lowe	2, 859. 0 2, 785. 7	3. 456209 3. 444933
Gretna	49 97		24. 019 50. 815	43 84		27. 5 47. 0	223 264	50 35	05. 7 09. 2	Center XXXII Lowe	3, 177. 5 4, 264. 9	3, 502082 3, 629909
Neche	49 97		02. 513 09. 875	90 124 169 293	13	49. 9	270 304 349 113		38. 9 53. 4 19. 0 12. 9	BuyCenter XXXII_Gretna_Neche (G. S. of C.)	5, 032. 1 3, 678. 4 4, 449. 8 2, 480. 1	3. 701750 3. 565655 3. 648341 3. 394461
Center XXXIII	49 97		53. 499 00. 552	59 128		49. 0 18. 6	239 308		11. 4 10. 0	Neche Gretna	3, 064. 0	3. 486292 3. 648149
Short	49 97		48, 232 11, 773	30 103			210 283	22 55	17. 3. 54. 2	Center XXXIIIGretna.	1, 959. 8 4, 584. 4	3, 292217 3, 661286

Station			le and cude	A	zimu	ith	Back	azi	muth	To station	Distance (meters)	Logarithm
Long			38, 889 07, 361	0 101 154 178		52. 5 36. 0 53. 6	334	06	34. 7 55. 9 50. 3	Neche Center XXXIII Short	3, 781. 1 2, 545. 8 3, 996. 6	3. 577617 3. 405821 3. 601693
Neche west base	49 97		02. 037 08. 098	90 220 286 313	13	38. 3 12. 9 55. 4 14. 8	270 40 106 133	49 15	51. 7 03. 9 26. 5 52. 6	Neche Center XXXIII Long Neche (G. S. of C.)	1, 255. 7 2, 100. 4 2, 556. 3 1, 410. 9	3. 098902 3. 322301 3. 407615 3. 149481
Neche east base	49 97		01. 973 05. 644	2 90 144	48 03 58	08. 8 32. 6 22. 5	182 270 324	02	07. 5 00. 2 41. 1	Long	714. 0 2, 489. 00 1, 943. 9	2. 853668 3. 396025 3. 288682
Center XXXIV	49 97	00 28	54. 768 10. 968	56 114	50 13	25. 9 40. 6	236 294		12. 8 24. 2	LongShort	4, 283. 4 4, 027. 6	3. 631784 3. 605049
Den	48 97	59 25	02. 405 11. 905	98 133	54 39	05. 7 36. 7	278 313	49 37	37. 5 21. 5	Long Center XXXIV	7, 314. 0 5, 029. 5	3. 864156 3. 701526
More	49 97	01 25	48, 001 09, 738	0 65 90	29 57 05	34. 8 10. 6 37. 4	180 245 270	29 54 01	33. 2 53. 8 04. 1	DenCenter XXXIVShort	5, 115. 7 4, 032. 6 7, 354. 4	3. 708906 3. 605581 3. 866545
Center XXXV	49 97	00 23	43. 204 10. 092	38 129	30 28	14. 1 52. 2	218 309	28 27	42. 2 21. 9	Den	3, 978. 3 3, 149. 0	3. 599698 3. 498173
Halb	48 97	59 19	09. 804 40. 322	88 124	05 06	35. 1 25. 7	268 304	01 03	24. 9 47. 4	Den Center XXXV	6, 745. 7 5, 148. 4	3, 829027 3, 711670
Let	49 97		48, 788 32, 952	1 65 89	44 21 49	51. 0 25. 3 54. 3	181 245 269	44 18 45	45. 4 41. 3 39. 9	Halb Center XXXV More	4, 913. 5 4, 854. 7 6, 841. 5	3. 691395 3. 686164 3. 835152
Center XXXVI	49 97	00 16	17. 445 01. 590	64 123	51 19	08. 1 42. 0	244 303	48 17	$\begin{array}{c} 23.0 \\ 02.4 \end{array}$	Halb	4, 912. 9 5, 138. 7	3. 691336 3. 710854
Nash	48 97	58 15	38, 423 07, 367	99 160		10. 7 17. 7	279 340	52 10	44. 8 36. 8	Halb	5, 634. 2 3, 251. 5	3. 750830 3. 512086
Wet	49 97		48, 025 42, 560	4 29 90	55 51 15	21. 6 33. 4 34. 3	184 209 270	55 50 11	33.8	Nash Center XXXVI Let.	5, 878. 8 3, 226. 2 5, 899. 0	3, 769286 3, 508689 3, 770782
Emerson	49 97		20, 516 49, 480	41 139	38 38	45. 7 56. 8	221 319	37 37		Nash		3, 625264 3, 549962
Barnet	48 97	58 11	39. 149 20. 074	89 149	44 52		269 329	41 51		NashEmerson	4, 622. 2 3, 620. 7	3. 664845 3. 558790
Elkins	49 97	01 10	47. 790 20. 294	11 48 90	47 21 06	00. 9 57. 1 19. 6	191 228 270	20	15. 8 04. 5 01. 6	Barnet Emerson Wet	5, 952. 8 4, 056. 8 5, 327. 7	3, 774718 3, 608182 3, 726539
States (U. S. C. & G. S.)	49 97	00 07	01. 447 39. 343	60 135		26. 8 39. 8	240 315	26 06		Barnet Elkins		3. 712457 3. 666102
Finney	48 97	58 05	42. 448 02. 057	89 127		47. 6 58. 5	269 307	12 19	02. 3 59. 8	BarnetStates	7, 687. 7 4, 022. 5	3. 885796 3. 604498
Shultz	49 97	01 05	48. 269 01. 255	0 44 89	14	45. 9 45. 5 09. 4	180 224 269	12		FinneyStatesElkins	4,605.3	3. 758937 3. 663255 3. 811639
Humboldt	48 97	55 04	10. 461 46. 022	158 177	36 08	04. 7 57. 9	338 357	33 08	54. 0 45. 8	StatesFinney	9, 655. 7 6, 556. 7	3. 984783 3. 816684
Joe	48 96		29. 012 54. 157		46	36. 8 32. 8 03. 6		41	26. 2 10. 0 41. 3	HumboldtShultz	10, 385. 2 8, 711. 5 10, 641. 7	4. 016414 3. 940094 4. 027011
Schrader	49 96		47. 427 54. 140	0 56 90	44	12. 3 19. 9 59. 8	236	38		Joe Finney Shultz	6, 129. 4 10, 406. 4 8, 676. 4	3. 787413 4. 017302 3. 938341
Orleans	48 96		02. 284 33. 436	81 113 116 147	57 12 39	28. 7 58. 2 32. 5	261 293 296	30	49.5	Humboldt Finney States Joe	12, 581. 7 16, 509. 9	4. 055448 4. 099738 4. 21774 3. 729250
Canada (U. S. C. & G. S.)	49 96		00. 967 13. 184	21 57 63 90 119	35 35 08	57. 6 11. 2 24. 4 20. 7	201 237 243 269	31 57	28. 6 52. 4		16, 708. 6 6, 379. 9 17, 605. 6	3. 897949 4. 222939 3. 80481 4. 245650 3. 818789
Kraska	48			90 120 121	49		300	43		JoeSchraderCanada	12, 257. 7	4. 022786 4. 088409 3. 75362
Shock	96		44, 336 14, 158	56 90	42	48. 0 08. 2 20. 4	236	39	07.8	Canada	5, 812. 7	3. 79075 3. 76437 4. 02380
Casa	49		47. 608 45. 700	58		04. 2 41. 0			24.3			4. 04526 3. 95954

Station			de and tude	A	zim	uth	Bac	k azi	muth	To station	Distance (meters)	Logarithm
Wood.		58	12. 247	。 92	17	18. 6	o 272	,	22. 6	Kraska	9, 603. 6	3. 982432
			24. 150	124 176		28. 8 06. 8	304 356	23	34. 1 50. 5	Shock	11, 584. 3 6, 667. 2	4. 063869 3. 823945
Soft	49 96	02 36	21. 194 31. 017	37 80	47 48	44. 0 47. 3	217 260		02. 8 49. 7	WoodCasa	9, 728. 1 6, 475. 5	3. 988027 3. 811274
Kelson	48 96	58 36	44. 638 08. 683	81 129 176	33	05. 9 51. 5 15. 1	261 309 356	29	07. 9 37. 1 58. 2	Wood Casa Soft	6, 493. 0 8, 880. 6 6, 705. 1	3. 812448 3. 948443 3. 826408
Vita	49 96	03 32	51. 842 21. 703	25 61		27. 3 35. 8	205 241		35. 9 27. 4	Kelson Soft	10, 551. 2 5, 785. 2	4. 023302 3. 762320
Roseau	49 96		00. 546 37. 035	67 126 172	01 03 46	22. 1 46. 1 03. 2	246 306 352	00	57. 1 04. 1 29. 5	Kelson Soft Vita	5, 999. 9 7, 386. 2 7, 202. 5	3. 778144 3. 868424 3. 857484
Arbakka	49 96	02 28	26. 034 36, 197	39 120	17	08. 4 26. 9	10000000	14	51. 9 36. 6	RoseauVita	5, 805. 1 5, 290. 8	3, 763812 3, 723521
Mon. 871	49 96		00. 284 41. 040	90 121	05 59	55. 7 58. 2	269 301	59 55	11. 2 30. 1	RoseauArbakka	10, 894. 7 8, 505. 5	4. 037215 3. 929700
Caliento	49 96	04 22	04. 477 40. 341	0 67 88	06 12 10	28. 2 41. 8 00. 4	180 247 268	06 08 02	27. 6 13. 0 41. 2	Mon. 871 Arbakka Vita	7, 543. 6 7, 839. 2 11, 807. 6	3. 877576 3. 894273 4. 072163
Suran	49 96	00 14	53, 443 49, 454	80 121		35. 9 38. 3	260 301		39. 9 42. 7	Mon. 871 Caliento	9, 723. 8 11, 237. 6	3. 987834 4. 050675
Sundown	49 96		42. 288 09. 963	6 50 83		33. 8 52. 9 11. 8	186 229 263	28 56 30	04. 0 26. 9 46. 2	Suran Mon. 871 Caliento	7, 114. 8 13, 551. 3 10, 424. 5	3. 852163 4. 131981 4. 018054
Piney	49 96	04 05	43, 539 30, 460	58 89	00 50	16.8 40.0	237 269	53 44	$14.6 \\ 07.4$	SuranSundown	13, 393. 4 10, 542. 9	4. 126890 4. 022962
Duxby	48 96	54 02	31.611 55.832	129 170		14. 1 30. 4	309 350		15. 8 33. 7	SuranPiney	18, 704. 3 19, 163. 0	4. 271941 4. 282463
Mon. 888.	48 96	59 00	59. 849 15. 560	17 95 117 143	50 25 19 54	36. 2 02. 2 44. 5 41. 3	197 275 297 323	14 09	35, 3 02, 5 14, 3 43, 5	Duxby Suran Sundown Piney	10, 651. 1 17, 837. 3 19, 061. 0 10, 849. 3	4. 027394 4. 251328 4. 280146 4. 035401
Wampum	49 95	00 52	55, 613 00, 406	48 80 113	24 20	28. 6 16. 1 27. 3	228 260 293	16 14	14. 2 02. 4 15. 5	Duxby Mon. 888 Piney	17, 845. 7 10, 209. 4 17, 893. 3	4. 251533 4. 009000 4. 252690
Sandy	48 95	51 51	43. 735 20. 274	110 144 177	10 38 15	25. 0 46. 0 41. 2	290 324 357		40. 9 02. 4 10. 9	Duxby- Mon. 888 Wampum	15, 089. 5 18, 803. 7 17, 067. 8	4. 178675 4. 274244 4. 232177
Salol	48 95	51 34	58. 827 12. 939	88 127	49 28	54. 8 02. 7	268 307		01. 1 37. 8	Sandy Wampum	20, 943. 6 27, 328. 6	4. 321052 4. 436618
Mon. 903	48 95	59 32	57. 435 57. 446	5 55 94	56 55 32	28. 3 22. 1 38. 4	185 235 274	55 41 18	31. 4 30. 7 15. 7	Salol Sandy Wampum	14, 864. 4 27, 138. 0 23, 297. 9	4. 172148 4. 433578 4. 367317
Guibo	48 95	54 23	20. 383 06. 641	72 130	12 57	49. 9 40. 3	252 310		27. 9 14. 7	Salol Mon. 903	14, 261. 1 15, 902. 7	4. 154153 4. 201470
Warroad north base=Mon. 909	48 95	59 22	56. 463 30. 377	4 44 90	04 10 12	07. 3 34. 1 02. 9	184 224 270	03 01 04	39. 9 44. 4 09. 6	Guibo Salol Mon, 903	10, 408. 1 20, 547. 0 12, 746. 1	4. 017373 4. 312749 4. 105379
Warroad south base	48 95	55 19	19.862 33.829	67 157	02 13	37. 7 15. 71	246 337	59 11	57. 3 02. 55	Guibo Warroad north base	4, 706. 5 9, 268. 657	3. 672701 3. 967016
Buffalo	48 95	59 13	58. 700 56. 339	38 47 89	35 01 40	26. 6 44. 0 29. 7	218 226 269	54	12. 0 48. 9 01. 8	Warroad south base Guibo Warroad north base	11, 014. 9 15, 315. 9 10, 448. 8	4. 041979 4. 185143 4. 019066
Willow 1913	48 95	54 07	17. 122 57. 445	97 120 145	51 38 21	21. 9 29. 9 14. 5	277 300 325	42 27 16	37. 0 31. 6 43. 8	Warroad south base Warroad north base Buffalo	14, 311. 1 20, 623. 3 12, 831. 9	4. 155674 4. 314358 4. 108292
Gull Island	48 95	59 03	02. 469 31. 269	31 70	35 45	49. 9 09. 0 20. 8	211 250 274	32 33	29. 2 03. 1 01. 2	Willow 1913 Warroad south base Warroad north base	10, 345, 8 20, 755, 7 23, 217, 6	4. 014764 4. 317138 4. 365817
Stoney	49 95	09 07	03, 604 56, 980	0 46 343	01 27 46	11.3 16.55	180 226 163	01 16	11. 0 16. 64 56. 6	Willow 1913_ Warroad north base Gull Island	27, 385. 0 24, 492. 88 19, 337. 7	4. 437512 4. 389039 4. 286404
Gould	49 95	07 17	36. 412 03. 126	25 256 313	05 16 50	35. 0 02. 4 25. 0	205 76 134	01 22 00	27. 8 55. 5 38. 3	Warroad north base	15, 685. 1 11, 393. 1 22, 886. 2	4. 195487 4. 056643 4. 359574
Mon. 913	49 95	10 09	50. 280 10. 972	58 335	00	14. 2 01. 2	237 155	54	17. 0 57. 1	Gould Stoney	11, 287. 5 3, 620. 4	4. 052596 3. 558756
Lone tree	49	08	47. 383 54. 118	77 174	34 51	46. 0 45. 3 34. 7	257 354	28 51	36. 0 32. 6 17. 9	Gould	10, 152. 0 3, 811. 9 1, 261. 7	4. 006551 3. 581146 3. 100959

GEOGRAPHIC POSITIONS OF TRIANGULATION STATIONS AND MONUMENTS, GEORGIA STRAIT TO SUMMIT OF ROCKY MOUNTAINS, MINOR SCHEMES

Station		itud ngit	e and ude	Azi	mut	h	Back a	zim	uth	To station	Distance (meters)	Logarithm
Sumas Mountain		55 13	00. 26 20. 83	21	, 44 55 20	01 48	201	48	49 01	Whatcom Toad Pearson	27, 278. 5 18, 584. 6 29, 672. 3	4. 435820 4. 269153 4. 472351
Mon. 20	49 122		08. 78 29. 92	297 345 346	10 42 18		165	21 46 24	34 14 01	Sumas Mountain Toad Whatcom	20, 804. 6 23, 888. 2 35, 891. 8	4. 318160 4. 378184 4. 554995
Mon. 31			09. 24 05. 84		51 14 36		201 160 160			Toad Sumas Sumas Mountain	24, 952. 7 10, 302. 5 10, 117. 7	4. 397118 4. 012942 4. 005082
Mon. 30-A			09. 20 07. 63	269	57	07	89	57	08	Mon. 31	37, 44	1.573336
Mon. 41			09.31 33.22	36	39 33 02 05	49	215 216 269 269	34 29 56 49	53 27 02 53	Sumas Sumas Mountain Mon. 31 Mon. 20	11, 931. 4 11, 880. 7 10, 419. 0 25, 542. 8	4. 07669 4. 07484 4. 01782 4. 40726
Chilliwack		06 08	20. 66 26. 19	15 15 39 316		54 21	195 195 219 136	27 52 04 14	13 12 34 13	Sumas Sumas Mountain Mon, 31 Church	21, 968. 3 21, 854. 9 14, 790. 2 27, 345. 2	4. 341796 4. 339549 4. 169973 4. 43688
Black			08. 46 04. 34	62 146 302	19 08 28	33 35 25	242 326 122	10 03 34	02	Sumas Chilliwack Church	16, 793. 4 16, 086. 6 11, 838. 4	4. 225139 4. 20646 4. 07329
Vedder (G. S. of C.)			13. 54 34. 13	40 71 129 346		14	220 250 308 166	10 52 56 27	01	Sumas Mon. 31 Chilliwack Black	20, 162, 9 17, 444, 8 9, 190, 3 7, 787, 6	4. 30455 4. 24166 3. 96333 3. 89140
Mon. 44			07. 37 30. 68	51 90 191		42 29 31	230 270 11	53 40 18	26	Sumas Mon. 41 Vedder	15, 300. 4 4, 929. 9 5, 864. 8	4. 18470 3. 69283 3. 76825
Mon. 42			09.31 30.83	40 270	18 55	55 12	220 90	13 57	50 28	Sumas	12, 712. 3 3, 661. 9	4. 10422 3. 56371
Mon. 43			09. 27 48. 42	43 90 271		45	223 270 91	04	08 13 09	Sumas Mon. 42 Mon. 44	13, 285. 4 861. 9 2, 800. 2	4. 12337. 2. 93545 3. 44718
Mon. 44-A	49 122		05. 77 37. 94		14 52	37 21	271 348	13 51		Mon. 44 Vedder	2, 292, 2 5, 911, 7	3. 36025 3. 77171
Mon. 45			05.31 05.78	91	15	02	271	14	37	Mon. 44-A	653, 6	2. 81532
Amadis			16. 12 20. 96	67	02 25 43 55	54	228 247 299 304	22 39		Black Mon. 44-A Vedder Chilliwack	5, 656. 2	3. 77913 3. 75252 3. 86464 4. 21638
Isar		00 58	06.47 13.30	62 137 206	30		242 317 26	42 27 18	15	Black Vedder Amadis	7,840.3	3, 59236 3, 89433 3, 38021
Mon. 46		00 58	02.81 13.10	177	59	07	357	59	07	Isar	113.32	2. 05430
Mon. 47			00. 88 03. 06	93	13 44 44	55	255 273 325	43		Black Isar Amadis	6, 335. 1 2, 652. 8 2, 812. 3	3, 80175 3, 42371 3, 44905
Liumchen.			03, 43 53, 53	16 82 118	16		196 262 298		59 55 24	Church Black Chilliwack	8, 425, 5 12, 532, 5 24, 344, 1	3. 92559 4. 09803 4. 38639
Mon. 48	48 121	59 50	56. 16 57. 72	200	46	56	20	47	00	Liumchen	240.09	2.38037
Thurston			25. 60 59. 43	23 26 53 89		09 40 01 17	202 206 233 269	54 47 35 32	58 38	Church_ Liumchen_ Black Chilliwack	21, 578. 6 13, 230. 3 22, 804. 5 27, 316. 5	4. 33402 4. 12157 4. 35802 4. 43642
McGuire			02. 68 18. 16	34 56 73 106 182	40 27	13	214 236 253 286 2	36 16	35 04 51	Church Liumehen Black Chilliwack Thurston	14, 236. 6 6, 699. 2 18, 796. 1 28, 109. 3 8, 130. 9	4. 15340 3. 82602 4. 27406 4. 44885 3. 91014
Balan			52. 84 02. 15	94	00	16	273	57		Liumchen	4, 714. 5	3. 67343 3. 61380
Mon. 49	48	- 59	53, 83 31, 91	95 214	53 18	34	275 34 90	51 20	48	Liumchen McGuire Balan_	2, 893, 8	3. 46147 3. 68302 3. 26121

Station		itud	e and ude	Aziı	mut	h	Back a	zim	uth	To station	Distance (meters)	Logarithm
Camas	。 49 121		57. 54 21. 31	43 45 76 150		49 36 44 12	223 225 256 330	20 42 03 08	07 20 33 29	Church . Balan . Liumchen . McGuire .	13, 394, 4 2, 862, 8 6, 955, 6 2, 320, 3	4, 126924 3, 456796 3, 842333 3, 365543
Mon. 50		59 45	50. 85 29. 87	166 184	27 49	30 35	346 4	26 49	54 42	McGuire	4, 189. 1 2, 067. 5	3, 622118 3, 315435
Mon. 51	48 121	59 44	50. 84 58. 03	90 167	02 04	00 19	270 347		36 02	Mon. 50 Camas	647. 2 2, 114. 1	2. 811017 3. 325119
Mon. 52		59 44	50. 85 23. 26	90 91 150	00 06 12	57 24 38	270 271 330	00 04 11	06 24 54	Mon. 50 Balan Camas	1, 354. 0 3, 230. 4 2, 374. 2	3. 131616 3. 509257 3. 375518
Slesse	49 121	03 37	10. 63 27. 11	79 120	02 08	31 18	258 300	55 01	50 50	McGuire Thurston	10, 987. 1 12, 015. 4	4. 040882 4. 079738
Mon. 53	48 121	59 39	54. 33 59. 46	63 88 89 89 91 106 117 207	47 52 07 44 16 39 18 01	05 38 04 10 46 19 02 24	243 268 269 269 271 286 297 27	37 49 02 38 08 35 13 03	21 19 55 51 32 16 16	Church Mon. 52 Mon. 50 Balan Liumchen Camas McGuire Slesse	17, 566, 5 5, 363, 3 6, 717, 1 8, 592, 2 13, 297, 9 6, 826, 2 8, 656, 5 6, 808, 2	4. 24468/ 3. 729436 3. 82718/ 3. 93410/ 4. 12378/ 3. 83418/ 3. 93734/ 3. 83303/
Red	48 121		45. 80 48. 35	71 91 99 117 123 191	51 36 18 02 41 23	53 25	251 271 279 296 303 11	40 20 09 57 35 24	47 10 46 28 23 58	Church Black Liumchen Camas McGuire Slesse	18, 107, 3 27, 173, 9 14, 936, 8 8, 964, 7 10, 980, 1 8, 346, 0	4. 257856 4. 434155 4. 174256 3. 952536 4. 040606 3. 92148
Silver			47. 11 14. 05	32 45 61 82 312	02 51 33 36 29		211 225 241 262 132	55 45 21 25 41	56 34 04	Red Slesse McGuire Thurston Glacier	19, 714. 8 12, 253. 5 22, 270. 5 19, 334. 9 26, 278. 5	4. 29479 4. 08826 4. 34773 4. 28634 4. 41960
Mon. 54	48 121	59 37	56. 15 44. 01	31 183	02 16	56 09	211	02 16		RedSlesse	2, 536. 6 6, 017. 7	3. 40424 3. 77942
D			00. 37 01. 11	48 59 143 204		16 13 34 45	227 239 323 24	59 03 35 54	10	Red	6, 214. 3 3, 859. 6 4, 998. 8 13, 850. 1	3, 79339 3, 58653 3, 69886 4, 14145
E	49 121		02. 07 57. 21	68 87 144	19 45	28 08	248 267 324	15 42 12		Red	6, 370. 7 4, 613. 7 2, 220. 3	3. 80418 3. 66404 3. 34640
North	49 121		51. 14 58. 66	256 301	17 32		76 121			D	1, 203. 6 2, 896. 4	3. 08048 3. 46186
South			17. 74 12. 44	137 189 287	41 54 33		317 9 107	55	03	North D E	1, 395. 2 1, 336. 8 1, 603. 8	3. 14463 3. 12606 3. 20514
Power	48 121		55, 18 36, 66	204 223 247	04 57 50	00	24 43 67	04 58 51	12	North D South	1, 893. 3 2, 797. 5 1, 848. 3	3. 27721 3. 44677 3. 26677
Mon. 55	48 121		56. 88 42. 19	294	58	49	114	58	53	Power	123. 96	2. 09329
Mon. 56			57. 93 56. 42		27 20	11 38	249 269		31 46	RedMon. 54		3, 80206 3, 66525
F	48 121		55. 73 35. 89	74 92 96 124	23 46	15 08	254 272 276 304	22 45		Red. Mon. 56. E. D.	7, 874. 5 1, 638. 4 1, 664. 6 3, 563. 4	3. 89622 3. 21441 3. 22131 3. 55186
G			13. 90 05. 65	37 57 85 114	13 32 01	18 38 57	217 237 264 294	30 58	29 59	F E	3, 032, 1 4, 132, 6 4, 802, 3 8, 546, 0	3. 48174 3. 61621 3. 68145 3. 93176
Cope	49 121	00 29	01. 84 48. 71	86 144	50 55		266 324			F	3, 403. 4 2, 720. 2	3. 53191 3. 43460
Mon. 57	48 121	59 31	58, 80 32, 65	193 267	18 26		13 87	18 27	30 35	GCope	2, 384. 0 2, 114. 9	3. 37730 3. 32529
Mon. 58	48 121	59 31	58. 82 20. 01	89 187	50 10		269 7	50 10	06 16	Mon. 57	257. 0 2, 337. 5	2. 40989 3. 36875
Middle	48 121	59	43. 92 33. 99	81 94 106 110 120 132 172 279	53 16 44 02 34 03	05 06 57 26 43 37 39	290	45 13 40 01 28 01 14	22 03 05 29 00 43 24	RedF	12, 619. 1 4, 930. 6 8, 214. 4 1, 616. 5 12, 573. 4 4, 150. 4 15, 064. 4 17, 571. 2	4, 10102 3, 69290 3, 91457 3, 20858 4, 09945 3, 61809 4, 17795 4, 24480

Station		itude	e and ide	Aziı	nutl	h	Back a	zimi	uth	To station	Distance (meters)	Logarithm
Mon. 59	6 48 121		59. 23 45. 72	88 89 287	, 13 39 57			11 38	31 19 34	F Mon. 57 Middle	3, 460. 5 2, 173. 5 1, 532. 9	3. 539135 3. 337154 3. 185514
J	49 121		15. 70 41. 13	12 54 65 75 98 163	54 12 20 27 10 09	32 08 29 09 37 13	192 234 245 255 278 343	53 08 17 21 03 07	52 26 54 37 14 17	MiddleF.G.B.S.S.S.S.S.S.S.S.S.S.S.S.S.S.S.S.S.S	4, 810. 3 7, 387. 0 4, 572. 5 9, 236. 3 12, 020. 4 10, 697. 9	3. 682174 3. 868467 3. 660156 3. 965496 4. 079920 4. 029300
H	49 121		27. 50 10. 08	19 65 68 111	51 48 26 54	02 47 04 13	199 245 248 291	50 47 24 52	44 35 49 01	Middle	1, 431. 5 2, 131. 2 2, 155. 6 3, 844. 8	3. 155777 3. 328624 3. 333560 3. 584878
Mon. 60	48 121	59 28	59. 56 25. 04	20 88 89 92 125	37 41 38 23 08	57	200 268 269 272 305	37 38 37 22 06	36 37 56 03 44	Middle F Mon. 59. Cope G	516. 3 5, 100. 1 1, 640. 0 1, 702. 0 3, 990. 8	2,712880 3,707580 3,214838 3,230955 3,601063
Mon. 61	48 121	59 26	59. 98 37. 59	78 114	10 21	14 02	258 294	08 19	46 52	Middle	2, 417. 5 2, 063. 1	3. 383358 3. 314523
L	49 121		46. 72 34. 47	68 95 133			248 275 313	40 51 21	42 12 59	Middle J Silver	10, 456. 7 8, 712. 5 16, 195. 4	4, 019396 3, 940145 4, 209391
M	48 121		13. 94 52. 64	96 128 198		02 48	276 308 18	25 22 36	59 25 38	Middle J	8, 211. 8	3. 914438 3. 956052 3. 697212
Κ	49 121		20. 44 45. 79	126 262 309	05 39	18 15	306 82 129	03 43 32	51 10 11	J L M	2, 898. 8 6, 376. 5 6, 142. 3	3. 462215 3. 804585 3. 788328
File	49 121	00 23	25. 42 02. 62	79 117 121 230 327	15 09 04 08	33 49 46	259 297 301 50 147	11 07 01 10 12	15 30 18 38 55	Middle	3, 725. 9	3. 836085 3. 571236 3. 819858 3. 593324 3. 419422
Mon. 64	49 121	00 22	01. 70 39. 72	85 89 122 124 147	23 46 05	45 30 20	265 269 302 304 327	36 20 44 01 34	07 46 10 33 41	Middle Mon. 61 K J File	4, 835. 3 4, 496. 2	3. 858668 3. 684427 3. 652848 3. 868761 2. 938650
Mon. 62	49 121		00.35 52.24	269 291			89 111	07 27	50 26	Mon. 64		3, 430398 3, 593573
Mon. 63	49 121		00.37 13.88	89 142			269 322	57 56	37 06	Mon. 62	779. 8 3, 099. 7	2. 891990 3. 491320
N	48 121	59 20	$\frac{22.11}{21.86}$	82 120 176	55	04	262 300 356	12 53 42	$\frac{14}{02}$ $\frac{55}{5}$	MFileL	3, 808. 4	3. 270153 3. 580740 3. 650756
Mon. 65	49 121	00 20	03. 84 00. 94	18 55 100	50	12	198 235 280	15 48 12	48	N M File		3. 132754 3. 438454 3. 574287
0	49 121	00 18	22. 02 12. 46	54 64			234 244	51 48	23 33	N		3. 507319 3. 694166
Mon. 67		00 17	03. 78 46. 81			12			12 07 55	N		3, 532066 3, 718426 2, 885208
Mon. 66			03. 76 01. 61		52		89		46	Mon. 67		2. 478426
Whitworth	49	04	04. 13 05. 36	8 65 67 108 269 302	05 01 22 52	14 01 32 54	188 244 246 288 90 122	03 59 49 09 02 09	35 20 35 06	Glacier L L Middle Silver L Lightning Hozomeen	10, 059. 3 20, 504. 8 21, 975. 5 14, 829. 5	4, 041598 4, 002568 4, 311856 4, 341939 4, 171125 4, 252858
Mon. 68			03. 33 59. 84	79 79 98 115 197	01 44 24 11	36 21 32 45	258 259 278 295 17	57 39 22 07 22	10 07 32	N	8, 529. 2 3, 957. 4 7, 512. 5	3, 824047 3, 930907 3, 597414 3, 875786 3, 891750
P	49 121	00 13	51. 48 29. 16	51 73 101 184 248	38 12 38	47 56 25	231 253 281 4 68	07 38	27 35 43	Whitworth	10, 668. 0 8, 808. 1 5, 970. 9	3. 374448 4. 028085 3. 944882 3. 776041 4. 215899
Q			47. 25 00. 22	46 162 252	38	09	226 342 72	37	20	Whitworth	2, 496. 6 4, 430. 6 14, 161. 7	3. 397356 3. 646460 4. 151116

Station			le and tude	Azi	imu	th	Back	azin	nuth	To station	Distance (meters)	Logarithm
Mon. 69	49		02, 61 34, 82			24 43	302 346 350	08	58 35	P WhitworthQ	2, 771. 1 7, 684. 4 3, 273. 5	3. 442659 3. 885609 3. 515013
Mon. 70		00	02. 12 13. 43	106 133 147	47	40	286 313 327		34	P	5, 416. 2 4, 693. 9 8, 836. 5	3, 733696 3, 671533 3, 946280
S			37. 59 42, 11	94 118 140 235	08 03	56 52	274 298 320 56	10 06 00 05	26 33	P	5, 848. 9 4, 564. 3 8, 324. 4 11, 442. 5	3. 767077 3. 659378 3. 920354 4. 058519
Т			27. 93 57. 64	124 199	44 38		304 19			SLightning	7, 034. 7 11, 040. 3	3. 847245 4. 042983
Mon. 72	49 121		01.30 40.98	6 100	41 24		186 280	41 20	38 53	T	2, 904. 3 6, 221. 8	3. 463042 3. 793918
Mon. 71			01. 31 35. 77	217 269 325	59	21	37 90 145	15 00 20	48	Lightning Mon. 72 T	9, 434. 1 2, 333. 1 3, 507. 3	3. 974702 3. 367936 3. 544970
Mon. 73			01. 47 05. 61	89 95 96 117 181	54 54 13	54 20 18	269 275 276 297 1	55 45 48 04 40	33 36 14	Mon. 71 P. S. Whitworth Lightning	5, 491. 2 15, 189. 9 9, 344. 6 16, 429. 5 7, 510. 1	3. 73966; 4. 181556 3. 97056; 4. 215624 3. 87564;
Brush	49 120	02 57	04. 23 58. 81	45 101 136 284	28	20	225 281 316 104	00 16 05 56	56 37	Mon. 73 Whitworth Lightning Frosty West	5, 365. 3 18, 776. 7 5, 154. 5 9, 051. 9	3. 729594 4. 273619 3. 712184 3. 956742
Mon. 74		00 59	01. 53 58. 14	89 115 212		39	269 295 32	54 01 37	59 44 12	Mon. 73 Whitworth Brush	1, 371. 5 17, 659. 3 4, 499. 4	3. 137184 4. 246973 3. 653155
Rim			39. 16 42. 86	79 123 130 266		57 28	259 303 309 86	41 24 58 24	47	Mon. 74. Brush. Lightning. Frosty West.	6, 512. 3 4, 770. 3 9, 863. 7 4, 777. 2	3. 813734 3. 678546 3. 994042 3. 679174
Poley	48 121	59 00	33. 10 38. 67	177 214 223 254	48 10	52 01	357 34 43 74	45 50 10 16	52 32	Lightning Brush Mon. 74 Rim	8, 389. 6 5, 687. 4 1, 204. 2 7, 514. 4	3. 923743 3. 754912 3. 080681 3. 875892
Lone Mountain	49 120	00 56	37. 42 40. 23	67 74 149 268	44 36 14 41	44 30	247 254 329 88	41 34 13 43		Poley Mon. 74 Brush Rim	5, 237. 8 4, 172. 2 3, 120. 9 2, 385. 9	3. 719146 3. 620366 3. 494281 3. 377649
Mon. 76	49 120	00 54	01. 65 33, 54	90 113 170	14	07	269 293 350	55 12 42	32	Mon. 74. Lone Mountain Rim	6, 597. 8 2, 801. 9 1, 173. 9	3. 819399 3. 447452 3. 069621
Mon. 75	49 120	00 57	01. 63 11. 34	89 209 248 269	58 45 58 58		269 29 69 90	55 46 00 00		Mon. 74 Lone Mountain Rim Mon. 76	3, 390. 3 1, 273. 6 3, 232. 8 3, 207. 5	3. 530239 3. 105028 3. 509578 3. 506165
Mon. 77	49 120	00 51	01. 61 34. 38	106 212	02 51 41 44	51 56	286	55 49 42 45	28 31	Mon. 74 Rim Frosty West_ Frosty_	10, 239, 4 4, 002, 3 1, 735, 6 2, 051, 4	4. 010276 3. 602314 3. 239441 3. 312043
Mon. 83	49 120		01. 26 38. 39	27 94 188 239 277 295	32 48 01 00 51 50	20 20 02 05 55 06		39 01 08 03	34 37 24 58 32 11	Smoky Frosty Roche Princeton Sheep Ashnola	9, 711, 0 14, 123, 6 4, 190, 9 16, 716, 0 18, 969, 7 19, 941, 0	3. 987262 4. 149946 3. 622311 4. 223133 4. 278061 4. 299746
Patrice.	49 120	02 45	20. 93 04. 97	63 67 271 298 345	09 51 04 44 20	54 17 27 23 47	91	46	03 58 41 15 52	Frosty Frosty West Roche Mon. 83 Smoky	6, 968. 5 7, 531. 0 8, 437. 7 8, 961. 5 13, 360. 6	3. 843137 3. 876855 3. 926225 3. 952382 4. 125825
Mon. 79	49 120		01. 31 37. 36	90 101 188 269	06 51 40 57	44 07 20 55	8	47	14 40 44 11	Mon. 77 Frosty Patrice Mon. 83	7, 256. 8 5, 680. 9 4, 363. 1 8, 516. 0	3. 860744 3. 754417 3. 639794 3. 930234
Mack			01. 46 08. 27	90 107 210 270	04 21 09 08	40 32 49 16	287 30	01 19 11 09	20 14 22 25	Mon. 77 Frosty. Patrice. Mon. 79	5, 409. 0 3, 889. 5 4, 983. 8 1, 847. 8	3. 733116 3. 589898 3. 697562 3. 266653
Callahan			21. 34 55. 77		03	40 18 59 46	254 62	30 01 04 38	58 08 08 22	Frosty Frosty West Patrice Mack	3, 042. 4 3, 644. 9 3, 927. 7 2, 649. 7	3. 483219 3. 561688 3. 594138 3. 423191

Station		ide and itude	Azimuth	Back azimuth	To station	Distance (meters)	Logarithm
Mon. 78		0 01.48 8 03.20	0 / // 183 30 04 270 00 55	3 30 10 90 01 37	CallahanMaek	2, 471. 8 1, 116. 5	3. 393008 3. 047878
Mon. 80		0 00.97 1 55.14	138 17 07 227 44 54 269 50 52	318 14 44 47 47 44 89 53 21	Patrice- Roche	5, 794. 0 6, 188. 4 3, 999. 1	3. 762981 3. 791579 3. 601966
Otness	49 0 120 4	0 22. 55 0 06. 09	73 16 13 121 05 24	253 14 51 301 01 38	Mon. 80 Patrice	2, 314. 5 7, 088. 5	3. 364454 3. 850552
Mon. 82		0 00.86 0 06.02	90 05 44 125 29 46 179 52 38		Mon. 80_ Patrice_ Otness_	2, 218. 0 7, 457. 7 669. 9	3. 345953 3. 872604 2. 826037
Mon. 81	49 0 120 4	0 00.85 1 00.08	238 34 46 269 59 01	58 35 27 89 59 42	Otness Mon. 82	1, 285. 7 1, 098. 7	3. 109139 3. 040893
Turret	48 5 120 5	55. 68 51 38. 94	90 10 16 209 15 40 225 12 25 231 34 53 249 42 09 299 58 23	29 16 47 45 15 14 51 39 50 69 45 34	Hozomeen Frosty Callahan Patrice Mack Smoky	3, 658. 5 6, 389. 3 10, 212. 9 5, 866. 0	4. 040488 3. 563302 3. 805455 4. 009150 3. 768345 4. 119266
Bunker Hill	48 £ 120 £	58 49.43 29 18.06	101 04 52 120 34 42 195 17 53 273 07 29 314 48 12	300 28 01 15 19 43 93 12 03	Mon. 83. Roche. Princeton. Sheep. Ashnola.	12, 540. 2 11, 207. 4	4. 064671 4. 098304 4. 049504 3. 869677 3. 964660
Mon. 90	49 (120 2	00 02.21 24 06.05	70 31 03 89 59 51 299 31 23 338 24 01 358 45 42	269 48 52 119 40 43 158 24 40	Bunker Hill. Mon. 83. Remmel. Sheep Ashnola.	17, 731. 0 17, 353. 5 2, 857. 3	3. 827989 4. 248734 4. 239388 3. 455957 3. 942007
Nemo		01 24.09 37 01.35	37 37 59 138 56 17 243 56 02 296 51 10	318 55 26 64 03 42	Mon. 83 Roche Princeton Bunker Hill.	2, 110. 7	3, 509255 3, 324434 4, 138575 4, 023631
Ella		01 29.53 31 14.40	88 40 11 99 37 16 287 10 28 298 42 17 334 26 02	279 32 02 107 15 51 118 48 20	Nemo Roche Mon, 90 Sheep Bunker Hill	8, 553. 5 9, 112. 9	3. 848231 3. 932146 3. 959655 4. 046509 3. 738938
Mon. 87		00 02. 52 31 25. 25	89 47 32 110 17 08 116 37 29 184 41 16 270 01 01	290 12 54 296 32 23 4 41 24	Mon. 83 Nemo Roche Ella Mon. 90	7, 279. 9 9, 187. 1	3. 944682 3. 862124 3. 963177 3. 430868 3. 950708
Mon. 84		00 02.01 35 44.05	89 38 44 148 13 51 243 42 33 269 48 01	328 12 52 63 45 56	Mon. 83. Nemo. Ella.	3, 543. 6 2, 982. 7	3. 549449 3. 474604 3. 786064 3. 721020
Mon. 85 ecc		00 02.54 33 41.68	228 03 46 269 59 41 292 49 16	90 01 24	Ella Mon. 87 Bunker Hill	4, 022. 4 2, 773. 1 5, 815. 9	3. 604489 3. 442970 3. 764615
Mon. 85		00 02.54 33 29.72	90 00 40	270 00 31	Mon. 85 ecc	243, 24	2. 386033
Mon. 86		00 02.53 33 01.83	90 01 01	270 00 40	Mon. 85	566. 77	2. 753409
Mon. 89		00 02.31 25 41.66	62 55 16 90 05 20 270 05 20 311 35 33	270 01 00 90 06 32	Mon. 87	4, 941. 9 6, 983. 8 1, 943. 3 4, 006. 0	3. 693898 3. 844089 3. 288539 3. 602714
Mon. 88		00 02.46 28 51.17	13 37 28 90 03 10 104 15 28 109 59 01	270 01 13 284 09 18	Nemo	3, 131. 8 10, 275. 3	3. 365700 3. 495794 4. 011793 4. 081673
Mon, 93		00 01.44 16 56.21	71 07 54 90 11 58 323 22 56	270 06 34	Mon. 90	8, 125. 9 8, 737. 0 10, 645. 8	3. 909873 3. 941361 4. 027178
Cathedral		59 21, 27 11 15, 88	4 31 28 84 37 55 100 12 18 199 37 34 292 53 04	8 184 31 06 2 264 28 50 3 280 08 01 4 19 38 55	Remmel Sheep Mon. 93. Lake View	7, 330. 2 14, 674. 4 7, 028. 7 6, 462. 5	3. 865113 4. 166561 3. 846875 3. 810398 4. 239382
Walls		00 51.77 07 38.88	26 19 00 57 39 14 145 48 2 309 33 0	237 36 31 325 46 58	Remmel Cathedral Lake View	11, 268. 7 5, 222. 0 3, 979. 2	4. 051874 3. 717841 3. 599796 4. 176252

Station			le and ude	Azi	mut	th	Back	azin	nuth	To station	Distance (meters)	Logarithm
Bosek	49	00	L C L C L C L C L C L C L C L C L C L C		46 06	51 57 13 34		11 39 49 07	42 19	Sheep Mon. 93. Walls Cathedral Remmel	5, 821. 9 5, 632. 7 2, 671. 9	4. 143594 3. 765063 3. 750718 3. 426815 3. 987263
Kay	49 120		46. 84 39. 01	38 71 271 287	52 24	36 16	218 251 91 107	01 50 30 13	00 36	Sheep Mon. 90 Bosek Mon. 93	5, 124. 0 4, 428. 0 10, 238. 9 4, 740. 3	3. 709613 3. 646204 4. 010255 3. 675807
Check			01, 72 42, 64	64 90 120	09	49	244 270 300	24 05 30	45	Sheep Mon. 90 Kay	6, 573, 7	3. 786960 3. 817809 3. 438583
Mon. 91			01. 90 46. 94	90 186 270	37	12	270 6 90	06 37 08	18	Mon. 90. Kay. Cheek	4, 047, 1 1, 397, 6	3. 607149 3. 145383 3. 402526
Mon. 92	49 120		01. 76 27. 44	133 270			313 90	44 04		KayCheck	2 013 9	3. 304038 2. 959323
Rambo	48 120	59 13	23. 66 16. 20	104 208 271	10	36	284 28 91	36 11 44	22	Mon. 93 Bosek Cathedral	2, 620, 0	3. 664851 3. 418297 3. 388670
Mon, 95			00. 43 50. 27	69 90	10 41	49 43 28 44	203 249 270 304 18 67	01 12	50 06 24 45	Cathedral Rambo Mon. 93 Bosek Lake View Walls	3, 176. 7 7, 438. 3 2, 089. 3 5, 148. 7	3. 119622 3. 501972 3. 871474 3. 319998 3. 711700 3. 623293
Mon. 94			00. 90 24. 46	270	14 14 41	39	270 90 171	16		Mon. 93 Mon. 95 Rambo	3, 134, 2	3, 633878 3, 496133 3, 065388
Mon. 104	48 119	59 56	59. 36 10. 04	222	08 18 46	36	197 42 112	07 21 53	42	Windy_ Snowy_ Chopaka_	8, 316, 7	3. 919949 3. 870701 4. 083412
Crawford		58 00	55. 18 26. 07	64 93 112 122 233 249 335	18 03 44 07	35 36 07 10 16	244 273 292 301 53 69 155	42 25 13	05 24 09 17 29 30	Remmel Cathedral Walls Lake View Snowy Mon. 104 Windy	15, 253, 3 13, 236, 5 9, 506, 4 13, 008, 9 12, 646, 9	4. 183365 4. 121774 3. 978017 4. 114240 4. 101984 3. 745853 3. 817709
Mon. 103	48 119	59 56	59. 28 38. 84	13 66 225 269	12 49 27 45	16 39	193 246 45 89	46	25 07	Windy Crawford Snowy Mon. 104	5, 026, 0	3. 911737 3. 701224 3. 893925 2. 767573
Mon. 102	48 119	59 58	58, 88 45, 22	46 235 269	11 56 42	21	226 56 89	09 01 44	24	Crawford Snowy Mon. 103	2, 842. 0 9, 836. 8 2, 568. 7	3. 453627 3. 992854 3. 409718
Giles	49 120	00 01	27. 16 36. 00	95 284 333		23	275 104 153	50 08 25	32	Walls Mon. 102 Crawford	7 413 4	3. 870015 3. 553810 3. 502055
Mix	48 120	59 02	37. 32 20. 42	210 261 299		50 12 21	30 81 119	23 21 15	23 54	Giles Mon. 102 Crawford	1 784 7	3. 251557 3. 645899
Mon. 98	48 120		58. 80 27. 91	107 248 269 295	48	45	287 68 90 115	45 56	35 56 18	Walls Giles Mon. 102 Mix	The state of the s	3. 425615 3. 728891 3. 386900 3. 759369 3. 182989
Mon. 96	48 120	59 08	59. 96 27. 77	90 211 264	18 49 13	07 43 28	270 31 84	16 50 18	20	Mon. 95. Walls. Giles.	2, 896. 4 1, 883. 8 8, 411. 1	3. 461853 3. 275032 3. 924851
Mon. 97	48 120		59. 19 00. 09	90 116 258 270	20 44 12 21	53 11 38 02	270 296 78 90	18 42 15 22	16 11 12	Mon. 96. Walls Giles. Mon. 98.	4, 221. 4 3, 612. 9 4, 237. 0 1, 873. 8	3. 625460 3. 557861 3. 627062 3. 272714
Earle	49 120	00 02	07. 03 42. 65	272 308	19 57 37 46	49 31 28 32	65 93 128 153	20 00 39 46	11	Giles_ Mon. 102 Crawford_ Mix	1, 490. 5 4, 832. 5 3, 554. 7 1, 022. 9	3. 173325 3. 684176 3. 550799 3. 009815
Mon. 99	48 120	59 02	58. 47 09. 91	18 111 217	06 40 51		291	06 40 52	00 11 10	Mix_ Earle_ Giles_	687. 2 716. 0 1, 122. 8	2. 837061 2. 854928 3. 050294
Mon. 100	48 120	59 01	58. 50 23. 43	60 89 99	33 57 18	17 05 15	240 269	32 56 17	34	Mix Mon. 99 Earle	1, 330. 2 944. 8 1, 631. 6	3, 123921 2, 975323 3, 212606
Mon. 101	48 120		58. 62 04. 70	76 90		04 02	256 270	34 03 43	21 28	Mix. Mon. 98. Mon. 102.	2, 836. 1 4, 130. 4 1, 615. 6	3. 452719 3. 615996 3. 208345

Station		ide and itude	Azimuth	Back azimuth	To station	Distance (meters)	Logarithm
Mon. 106.		0 00. 20 0 30. 02	89 49 10 160 45 47 317 59 56	340 44 36	Mon. 104 Snowy Chopaka	6, 911. 3 5, 786. 0 6, 359. 9	3. 839562 3. 762380 3. 803448
Manley		0 36.11 5 23.44	39 50 17 53 25 00 222 56 10 280 30 20	42 58 41	Mon. 104 Mon. 103 Snowy Mon. 106	1, 908, 7	3. 169792 3. 280732 3. 774400 3. 782892
Jordan	48 5 119 5	9 46.04 3 38.06	97 36 12 125 50 42 197 57 12 297 55 55	305 49 22 17 58 24	Mon. 104 Manley Snowy Chopaka	3, 116. 7 2, 642. 1	3. 493691 3. 421956 3. 792572 3. 961252
Mon. 105	48 5 119 5	9 59.91 2 41.14	69 41 00 89 47 36 108 44 44	269 44 59	Jordan Mon. 104 Manley	1, 233. 6 4, 246. 1	3. 091190 3. 627990 3. 541961
Mon. 107		0 00.56 7 17.04	89 51 30 133 07 10 356 01 06	313 03 34	Mon. 106. Snowy. Chopaka	3, 922. 5 7, 980. 1	3. 593560 3. 902011 3. 676729
Little Chopaka		6 07.71 4 42.22	24 54 26 144 40 03 255 38 51	324 34 30	Tiffany Snowy Similkameen	32, 567. 8 15, 508. 3 9, 512. 4	4. 512788 4. 190563 3. 978290
Mon. 111		0 00, 83 1 21, 84	241 03 49 274 48 46 313 20 08	94 57 38	End. Osoyoos. Similkameen.	5, 905. 9 14, 381. 2 7, 065. 2	3. 771289 4. 157794 3. 849127
Mon, 113	49 0 119 3	0 00.80 8 04.59	90 02 03 202 07 44		Mon. 111 End	4, 009. 2 3, 083. 3	3. 603062 3. 489016
Palmer	48 5 119 4	8 45, 40 1 43, 62	190 45 20 227 14 30 242 21 40	47 17 58	Mon. 111 End Mon. 113	2, 372. 1 7, 642. 2 5, 025. 4	3. 375135 3. 883219 3. 701168
Mon, 112		0 00.82 9 10.77	53 09 04 90 01 16 332 59 17	269 59 37	Palmer Mon, 111 Similkameen	3, 883. 9 2, 664. 0 5, 444. 0	3. 589270 3. 425535 3. 735921
Mon, 108		0 00.73 5 21.90	89 52 58 123 44 22 269 56 16 295 46 16 297 39 04	303 39 19 89 59 17 115 52 28	Mon. 107 Snowy Mon. 111 Similkameen Palmer	2, 340, 5 9, 816, 6 4, 879, 4 11, 129, 5 5, 010, 9	3. 369309 3. 991959 3. 688368 4. 046476 3. 699915
Mon. 109	49 0 119 4	0 00.84 3 47.60	269 59 30 312 44 43		Mon, 111Palmer		3, 471708 3, 535690
Mon. 110		0 00.84 1 59.44	89 58 34 90 01 07 352 08 24	269 59 45	Mon. 108 Mon. 109 Palmer	2, 198. 6	3. 614385 3. 342140 3. 371546
Mon. 114		0 00.81 4 46.48	30 54 59 90 02 48 280 58 45	269 57 50	Similkameen Mon. 111 Osoyoos	5, 652. 7 8, 036. 2 6, 409. 9	3. 752256 3. 905048 3. 806850
Mon. 115		0 00.82 1 20.18	90 03 56 257 45 51 300 15 24	77 53 44	Mon. 111 Sidley Osoyoos		4. 087403 4. 115416 3. 385496
Mon, 116		0 00.76 0 15.51	219 13 43 256 24 49 269 58 45 327 20 46	76 31 54 90 02 13	Osoyoos north base Sidley Mon. 118 Osoyoos	4, 009. 2 11, 763. 2 5, 616. 0 1, 452. 4	3. 603058 4. 070525 3. 749430 3. 162078
Mon, 119		0 00, 74 4 06, 20	27 26 38 79 43 56 90 00 19 90 03 37	259 39 46 269 59 09	Osoyoos south base Osoyoos Mon. 118 Mon. 115	6, 190. 0 6, 834. 0 1, 890. 5 8, 821. 1	3. 791692 3. 834677 3. 276588 3. 945523
Mon, 120		0 00.76 2 51.80	38 28 56 81 35 50 89 59 01 348 49 16	261 30 44 269 58 04	Osoyoos south base Osoyoos Mon. 119_ Hump	8, 326. 5	3. 846164 3. 920465 3. 179627 3. 923367
Mon, 121		0 00.73 0 24.85	9 26 01 53 16 21 83 50 43 168 23 12	263 43 46	Hump Osoyoos south base Osoyoos	9, 178. 4 11, 289. 7	3. 920907 3. 962769 4. 052684 3. 448737
Molson (U. S. G. S.)		9 46.93 9 41.15	19 24 46 146 04 13 295 16 20	326 02 33	Balsam Gillespie Bolster	6, 290. 0 4, 836. 0 6, 194. 2	3. 798648 3. 684484 3. 791982
Taylor		1 07.11 6 08.96	60 09 04 102 23 12 255 43 40 308 34 12 345 54 44	282 18 51 75 48 26 128 39 38	Molson Gillespie Tippie Copper Bolster	7, 176, 6 7, 948, 6	3. 696626 3. 855920 3. 900291 4. 051560 3. 722866
Mon. 122		0 00.72 8 36.76	23 27 06 246 17 43 272 11 07	66 22 47	Hump Gillespie Molson	8, 961. 4 8, 934. 3 10, 895. 6	3. 952378 3. 951059 4. 037251

Station			le and ude	Azi	mut	h	Back a	zim	uth	To station	Distance (meters)	Logarithm
Mon. 123	49	00	00, 68 51, 91	1000		34 19	270 294 53	00 13 26		Mon. 122 Sidley Gillespie	3, 350, 7 6, 704, 1 6, 019, 2	3. 525140 3. 826341 3. 779538
Mon. 124		00	00. 67 22. 66	90 106 206	48	55 34 41	269 286 26	58 42 39	58 54 48	Mon. 122	6, 384. 5 9, 551. 0 4, 014. 1	3. 805124 3. 980050 3. 603585
Gill			18. 14 02. 67	161 300			341 120		25 13	Gillespie Molson	3, 221. 5 1, 917. 0	3. 508053 3. 282631
Bride	49 1:9	01 10	04, 14 22, 60		49 12 32	52	209 311 160	48 11 33	33 43 17	Gill Gillespie Molson	1, 637. 9 2, 469. 2 2, 529. 7	3. 214291 3. 392550 3. 403061
Son			00. 68 50. 76		15 05 44		290 325 341	14 03 44	52 35 01	Gill Gillespie Bride	1, 557. 9 4, 375. 1 2, 064. 5	3. 192528 3. 640986 3. 314806
Mon. 125	49 119	00 11	00. 67 41. 54	269 279 356	49	50 45 58	90 99 176	00 51 46	14 16 11	Son_ Molson_ Balsam_	2, 251. 6 2, 483. 6 6, 367. 4	3, 352498 3, 395088 3, 803964
Mon. 126			00. 88 55. 32	164 198 270	21 47 15	14	344 18 90	20 47 16	58 39 13	Gill Bride Son	553. 8 2, 064. 5 1, 312. 2	2. 743379 3. 314808 3. 117999
Mon. 127	49 119	00	00. 68 22. 94	139 242 300		22 52 15	319 62 120	25 31 27	28 18 29	Gillespie Taylor Bolster	4, 721. 5 4, 444. 3 6, 065. 1	3. 674084 3. 647808 3. 782840
Penny			06. 04 38. 56	76 85 316	33	10 01 41	256 265 136	39 31 11	38 42 37	Molson Mon. 127 Bolster	2, 560. 9 2, 128. 2 4, 487. 3	3. 408395 3. 328020 3. 651985
Mon. 128	49 119	00 07	00. 70 39. 53	80 89 186	14 59 52	32	260 269 6	13 58 52	19 14 29	Molson Mon. 127 Penny	2, 508. 5 2, 101. 9 166. 0	3. 399407 3. 322622 2. 220185
Hurst	. 48 119		53. 74 00. 03	175 298 338	52	22	355 118 158	25 57 52	20 41 55	Taylor Copper Bolster	2, 273. 7 9, 846. 4 3, 063. 5	3. 356728 3. 993277 3. 486222
Mon. 130			00. 68 23. 30	15 83 306		09	195 263 126	40 45 49	58 56 58	Bolster Hurst Copper	3, 191. 0 1, 978. 0 8, 306, 5	3. 503925 3. 296220 3. 919419
Mon. 129	49 119	00 06	00. 71 00. 55	90 270 357	00 01 10	23 03 54	269 90 177	57 02 10	51 16 54	Mon. 127 Mon. 130 Hurst	4, 113. 8 1, 976. 9 215. 7	3. 614245 3. 295980 2. 333777
Myncaster			02. 14 16. 03	43 219 337			223 39 157	11 46 32	11 21 46	Bolster Tippie Copper	6, 819. 8 2, 742. 0 7, 438. 7	3. 833772 3. 438071 3. 871498
Mon. 131	49 119	00 02	00. 65 45. 45	86 90 221 223	55 02 41 43	52 19 15 24	266 270 41 43	53 01 43 44	25 05 28 32	Hurst Mon. 130 Tippie Myneaster	3, 960. 9 1, 988. 8 5, 367. 5 2, 628. 7	3. 597794 3. 298591 3. 729771 3. 419744
Mon. 133			00. 69 22. 46	7 69 88 102	51 30 43 15	21 02 32 38	187 249 268 282	50 24 37 09	56 57 47 46	Copper Bolster Hurst Taylor	5, 023. 0 8, 755. 9 9, 303. 3 9, 699. 8	3, 700960 3, 942302 3, 968637 3, 986764
Mon. 132			00. 66 56. 64		16 44 58	37		16 45 00	28	Myncaster Tippie Mon. 133	1, 939. 4 4, 231. 3 3, 133. 9	3. 287676 3. 626476 3. 496088
Rock	49 118	01 52	12.86 23.37	262 305	19 01	18 52	82 125	23 05	36 22	Midway Knob	7, 012, 1 6, 919, 0	3. 845850 3. 840043
Johnny	49 118	00 57	03. 40 20. 60	142 250 256	20 24 36	00 46 09	322 70 76	18 28 44	07 30 12	Tippie Rock Midway	4, 955. 9 6, 410. 1 13, 350. 7	3. 695122 3. 806863 4. 125503
Mon. 134	49 118	00 57	00. 71 21. 60	193 249	40 46	30 35	13 69	40 50	31 20	Johnny Rock	85, 74 6, 457, 5	1, 933184 3, 810065
Mon. 144	49 118	00 44	00. 67 46. 24	64 143	20 32	29 28	244 323	18 31	14 01	KnobMidway	4, 026. 0 3, 932. 8	3. 604871 3. 594706
Mon. 141			00, 71 10, 84	109 190 270	22 45 00	12 08 32	289 10 90	18 45 02	16 30 21	Rock Midway Mon, 144	6, 731. 0 3, 217. 9 2, 939. 1	3, 828079 3, 507574 3, 468211
Frank	- 49 118	00 49	00. 64 02. 82	118 222	43 15	07 34			36 21	RoekMidway	4, 646. 2 4, 275. 5	3. 667101 3. 630991
Mon. 138	49 118		00. 66 43. 94	190 246 269	36 43 59		66	36 48 01	52 28 50	Rock Midway Frank	2, 269. 3 8, 019. 3 4, 494. 3	3. 355890 3. 904135 3. 652665

Station		tud	e and ide	Aziı	nut	h	Back a	zim	uth	To station	Distance (meters)	Logarithm
Irene	49	01	25. 77 06. 17	50 81 262 333	, 39 52 40 54	43 29 11 42	230 261 82 153	37 50 42 55	WIND TO	Mon, 138 Rock Midway Frank	2, 815. 9 4, 196. 4	3. 617651 3. 449619 3. 622875 3. 466559
Midway astronomic station			41. 18 06. 71	98 110 195	$\frac{40}{42}$	53 42 04	278 290 15	$\frac{36}{40}$	54 26 23	Rock Irene Midway	3, 898. 0	3. 813486 3. 590844 3. 296619
Midway azimuth station	49 118		00. 67 49. 06	116 161		12 25	296 341	40 26	58 46	IreneMidway	5, 848. 8 3, 336. 0	3. 767068 3. 523227
Mon. 137			00. 74 53. 34	219 240 270	22 20 06	02 19 04	39 60 90	23 23 06	10 11 56	Rock Irene Mon, 138	2, 882. 1 5, 311. 3 1, 410. 8	3. 459703 3. 725203 3. 149463
Men. 136	49 118		00. 70 32. 76	229 244 269	41 05 54	50 46 22	49 64 89	43 09 54	28 07 51	Rock Irene Mon. 137	3, 447. 1 6, 021. 1 801. 2	3. 537458 3. 779676 2. 903720
Mon, 135	49 118		00. 70 29. 36	245 251 269		28 42 06	65 71 90	59 23 00	34 32 34	Rock Irene Mon, 136	5, 473. 5	3. 738268 3. 914788 3. 374768
Mon. 139.	49 118		00. 68 59. 51	127 231 270	20 50	55 35	307 51 90	19 53 03	06 04	Rock Midway Frank	3, 676. 9	3. 565486 3. 709359 3. 061524
Mon, 140	49 118		00. 67 07. 41	90 113 137 208	01 13	29 56 27	269 293 317 28	58 10 25 57	00 43	Mon, 138	5, 620. 8	3. 74979 3. 752786 3. 552500 3. 55804
Mon, 143			00, 68 30, 72	90 115 155	10	55	270 295 335	00 07 35	54 27 56	Mon, 141 Irene Midway	2, 035. 1 6, 184. 0 3, 472. 3	3. 30859 3. 79126 3. 54061
Mon, 142	49 118	00 46	00. 68 33. 17	177 269 269		49	357 90 90	00 00 01	36	Midway		3. 50058 3. 10365 3. 33715
Mon, 145			00.67 01.23	69 90 109 134	33	26	248 270 289 314	58 00 28 10	50	Knob Mon. 141 Irene Midway	4, 866, 8 3, 854, 0	3. 68724 3. 58590 3. 89587 3. 65673
Mon, 146			00. 67 14. 35	72 90 107 126	02 28	28 58	252 269 287 306	21 59 23 55	47	Knob _ Mon. 141 _ Irene Midway _	5, 766. 6 4, 806. 8	3. 76092 3. 68185 3. 94309 3. 72112
Mon, 149	49 118	00 39	00. 65 52. 99	39 90 110		28	219 269 290	14 57 49	57	White Mon. 141 Midway	_ 8,899.8	3. 33823 3. 94937 3. 94837
Mon. 147			00. 65 21. 72	90 120 269		52	269 300 90	59 55 00	36	Mon. 141	6, 150. 3	3. 76912 3. 78889 3. 48046
Mon, 148			00.61 17.46	90 115 269		03	270 295 89	09 38 57	59	Johnny Midway Mon, 149	7, 301, 7	4. 29174 3. 86342 3. 23475
Danville			04. 62 01. 39	140 153 214	29 29 17		320 333 34	28 27 19	22 47 28	Hardy Eagle Grand Forks	6, 737. 8	3, 60678 3, 82852 3, 69991
Mon, 152			00. 62 00. 07	196 215 268		48	16 35 88	39 05 34		Eagle Hardy Danville	6, 421. 6 3, 962. 7	3. 80764 3. 59799 3. 68601
Mon. 151			00. 64 14. 26	216 269 269	01	52	36 89 90	36 06 01	28 33	Eagle Danville Mon. 152	7, 661. 2 7, 579. 9	3. 88429 3. 87966 3. 43576
Mon, 150	49 118		00. 64 12. 01	34 63 269	22 50	33	214 243 90	22 48 01	03 02	Fir White Mon. 151.	1, 440. 1 3, 823. 5	3. 15839 3. 58245 3. 55785
Mon, 153			00, 64 31, 94	89 188 267	59 31	38 37	269 8 87	58 31 42	32 55	Mon. 152 Hardy Danyille	1, 791. 4 3, 278. 9	3, 25319 3, 51572 3, 48608
Mon. 154	49 118		00. 64 13. 60	90 161	00	05 37	269 341	59	06 56	Mon. 153 Hardy Danville	1, 592. 4 3, 425. 8	3. 20205 3. 53475 3. 16814
Carson azimuth station			00. 64 13. 80	161 268	14		85 341 88		52	Hardy Mon. 154	3, 424. 5	3. 53460
Mon. 155	49	00	00. 64 33. 95	90 149	00		270 329 79		23 30	Mon. 154 Hardy Danville	805. 8 3, 763. 9	2. 90621 3. 57563 2. 82816

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Station		itud	le and ude	Azi	mut	h	Back a	zin	uth	To station	Distance (meters)	Logarithm
Mon. 156			00. 67 57. 02	° 199 238	, 35 23	" 08 38	o 19 58	, 36 28	77 04 05	Grand ForksGilpin	4, 522. 7 8, 436. 4	3. 65540 3. 92615
Mon. 159			00, 52 18, 86	90 135 199	04 54 09	32 37 07	270 315 19	52		Mon. 156. Grand Forks. Gilpin.	5, 653. 9 5, 940. 8 4, 680. 5	3. 75235 3. 77384 3. 67029
Mon. 157			00, 70 06, 24	89 186 234	57 29 18	37 28 57	269 6 54	29		Mon. 156 Grand Forks Gilpin	1, 032, 2 4, 287, 5 7, 576, 1	3. 01375 3. 63220 3. 87944
Mon. 158	49 118	00 25	00, 62 18, 21	90 158 221	02 08 51	48 52 22	270 338 41		48	Mon. 156. Grand Forks. Gilpin	3, 228. 1 4, 592. 8 5, 934. 0	3. 50894 3. 66207 3. 77334
Mon. 160	49 118		00. 61 34. 07	89 188	49 03	53 45	269 8		19 09	Mon. 159 Gilpin	910. 4 4, 462. 6	2. 95922 3. 64959
Mon. 161			00. 62 26. 65	90 144 219		57 25 29	269 324 39		36 27 32	Mon. 160 Gilpin Cascade	3, 809. 5 5, 444. 7 5, 233. 5	3. 58086 3. 73597 3. 71879
Castle			19. 28 32. 30	59 100 252		06 09 51	239 280 72	35 26 06	48 43 55	Owl Cascade Buck	9, 938. 6 8, 911. 6 8, 582. 0	3. 99732 3. 94995 3. 93358
Bowen			00. 92 39. 03	106	04	14 27	258 286 297 122	52 35 01 17	33 52 31 23	Owl	13, 572. 1 14, 096. 6 5, 322. 7 3, 121. 8	4. 13264 4. 14911 3. 72613 3. 49441
Mon. 162			00, 55 08, 49	90 187 255	03 05 15	29 33 12	270 7 75	01 05 20	45 51 57	Mon. 161 Cascade Castle	2, 808. 2 4, 085. 7 9, 584. 2	3. 44843 3. 61126 3. 98155
Mon. 163			00. 59 48. 05	89 149 249	59 55 13	28 06 09	269 329 69	57 53 17	42 39 07	Mon. 162_ Cascade_ Castle_	2, 854. 7 4, 684. 7 6, 861. 5	3. 45556 3. 67068 3. 83641
Otto			10.18 15.11	46 267 345	58 39 38	53 18 59	226 87 165	57 43 39	28 37 19	Mon. 162 Castle Mon. 163	3, 152. 2 6, 970. 7 2, 219. 1	3. 49861 3. 84327 3. 34617
Mon, 167			00.60 19.06	109	15 41 27		251 289 297	11 37 22	05 48 23	Owl Otto Cascade	8, 055, 6 6, 388, 7 8, 802, 9	3. 90609 3. 80541 3. 94462
Mon. 164			00. 62 45. 37	139 244 269		33 01 04		40 44 01	12	Otto_ Castle Mon. 167	2, 818. 5 5, 688. 0 4, 193. 4	3. 45002 3. 75495 3. 62256
Mon. 165	49 118	00 13	00. 62 23. 84	90 133 242	00 33 39	33 25 46	270 313 62		01	Mon. 164 Otto Castle	437. 57 3, 119. 5 5, 295. 7	2. 64104 3. 49408 3. 72392
Mon. 166			00, 61 23, 27	90 121 235	01 37 00	19 53 37	270 301 55		33 43 46	Mon. 165 Otto Castle	1, 231. 2 4, 100. 5 4, 240. 0	3. 09031 3. 61284 3. 62737
Mon. 168	49 118		00. 61 47. 05	72 115 269	38 37 51	57 37 57	252 295 89	33 32 55	50 22 04	Owl Cascade Bowen	8, 674. 4 9, 385. 0 5, 041. 3	3. 93824 3. 97243 3. 70254
Mon. 169	49 118		00. 92 38, 72	90	21		270	21		Bowen	6.26	0. 79686
Baldy	48 117		42. 24 32. 23	85 120 185 187	57 29 54 49	28 02 47 21	265 300 5 7	38 16 56 51	59 04 18 07	Northport Lake Kelly Beaver	30, 033. 3 24, 301. 0 23, 596. 5 20, 841. 3	4. 47760 4. 38562 4. 37284 4. 31892
Mon [.] 174	49 117	00 53	01. 82 34. 90	248 349	22 40	30 06	68 169	29 41		LakeNorthport	11, 613. 9 10, 384. 4	4. 06497 4. 01638
Sophia	49 117		29. 11 51. 11	46 250 354	34 52 59	$\frac{10}{26}$	226 70 174	33 58 59	37 34 39	Mon. 174 Lake Northport	1, 225. 8 10, 485. 8 11, 101. 5	3. 08841 4. 02060 4. 04538
Pete	48 117	59 51	37. 04 15. 75	129 237	41 41	52 18	309 57	40 46		SophiaLake	2, 518. 6 9, 430. 6	3. 40115 3. 97454
Mon. 175	49 117	00 49	02. 08 48. 23		30 40	22 37	246 282	29 38	15 19	PeteSophia	1, 940. 0 3, 809. 4	3. 28780 3. 58085
Mon. 176	49 117	00 46		34 82 89 96	20 39 58 00	42 14 09 53	214 262 269 275	52	23 31 41 58	Northport Pete Mon. 174 Sophia	12, 382. 5 6, 054. 3 8, 832. 1 7, 984. 6	4. 09280 3. 78206 3. 94606 3. 90225
Churchill Lookout	48 118		00. 55 06. 45	250 297	08 44	16 06	70 117	14 51		Mon. 174 Northport	11, 055. 4 13, 873. 1	4. 043574 4. 142178

Station		tude and igitude	Azimuth	Back azimuth	To station	Distance (meters)	Logarithm
Mon. 170	49	, ,, 00 01.07 03 41.08	89 54 00 259 21 38 269 49 41 305 36 41 332 39 40 351 46 23	0 / // 269 52 31 79 35 57 89 57 18 125 45 27 152 40 51 171 46 32	Bowen Lake Mon. 174 Northport Churehill Lookout Horn.	2, 397. 4 23, 512. 2 12, 321. 2 17, 474. 1 4, 190. 9 1, 689. 1	3. 379749 4. 371294 4. 090652 4. 242394 3. 622306 3. 227667
Mon. 171		00 01.17 02 16.40	89 54 13 258 33 10 269 •50 12 309 12 23 356 53 32	269 53 09 78 46 25 89 56 45 129 20 05 176 53 40	Mon. 170	1, 721, 2 21, 822, 2 10, 600, 0 16, 108, 1 3, 731, 8	3. 235839 4. 338900 4. 025304 4. 207045 3. 571916
Mon. 172		00 01.41 59 27.61	40 52 40 89 53 49 89 54 40 256 30 03 269 51 36 318 25 27	220 50 40 269 51 42 269 51 28 76 41 11 89 56 02 138 31 02	Churchill Lookout Mon. 171. Mon. 170. Lake. Mon. 174. Northport.	4, 936. 6 3, 430. 7 5, 152. 0 18, 470. 4 7, 169. 2 13, 629. 7	3. 693426 3. 535387 3. 711973 4. 266476 3. 855472
Cone		01 59.82 57 55.96	34 35 13 332 36 50	214 32 04 152 41 16	Churchill Lookout Northport	8, 975. 4	4. 134485 3. 953055
Velvet		00 33.42	62 39 55 123 35 02	242 34 17 303 32 33	Churchill Lookout	15, 605. 7 10, 268. 5	4. 193284 4. 011506
Sheep Creek	49	00 16.37 57 33.87	52 54 00 172 00 35 261 35 53 327 44 36	232 50 34 352 00 18 81 38 05 147 48 46	Cone Churchill Lookout Cone Velvet Northport	4, 827. 4 6, 951. 2 3, 227. 1 3, 613. 5 12, 607. 3	3. 683713 3. 842059 3. 508807 3. 557930 4. 100623
Mon, 173		00 01.70 55 55.61	102 47 50 146 11 02 238 08 37	282 46 36 326 09 31 58 09 36	Sheep Creek Cone Velvet	2, 048. 1 4, 392. 7 1, 857. 5	3. 311349 3. 642728 3. 268928
Silver Crown		54 25. 13 46 08. 11	91 29 59 178 37 40	271 25 31 358 37 31	Northport Mon, 176	7, 238. 2 10, 415. 8	3. 859634 4. 017693
Mon. 177		00 02.46 44 11.68	12 49 04 43 12 22 89 50 22	192 47 36 223 06 26 269 48 44	Silver Crown Northport Mon. 176	10, 686. 6 14, 031. 8 2, 615. 8	4. 028839 4. 147114 3. 417609
Melvin	48 117	59 32.70 36 33.88	63 52 21 117 30 53 225 34 43	243 40 40 297 24 43 45 43 18	Northport Lake Beaver	21, 083, 3 11, 208, 6 19, 351, 6	4. 323939 4. 049553 4. 286716
Waneta	49 117	01 11.24 35 24.80	24 46 07 58 47 03 100 40 05 316 33 03	204 45 15 238 34 30 280 33 03 136 39 00	Melvin Northport Lake Baldy	3, 352. 1 23, 778. 3 11, 543. 4 13, 987. 4	3. 525314 4. 376180 4. 062335 4. 145739
Rail		00 02.95 37 04.89	223 56 50 325 59 32	43 58 06 145 59 56	Waneta Melvin	2, 930. 4 1, 127. 2	3. 466928 3. 051995
Mon, 181		00 02, 95 37 35, 38	231 30 17 269 59 37 306 46 02	51 31 56 90 00 00 126 46 48	Waneta Rail Melvin	3, 390, 0 619, 8 1, 560, 8	3, 530204 2, 792245 3, 193353
Mon, 180		00 02.95 38 11.04	238 00 02 269 59 22 269 59 31 295 18 27	58 02 08 90 00 12 89 59 58 115 19 41	Waneta Rail Mon. 181 Melvin	3, 982, 9 1, 344, 5 724, 7 2, 184, 9	3. 600199 3. 128573 2. 860188 3. 339430
Mon. 179	49 117	00 02, 82 39 21, 85	246 17 22 269 54 24 285 13 39	66 20 21 89 56 07 105 15 46	Waneta Rail Melvin	5, 260. 6 2, 783. 9 3, 539. 1	3. 721037 3. 444657 3. 548891
Garden		59 13, 53 36 22, 04	53 17 54 65 36 40 112 38 10 119 32 42	233 10 32 245 24 50 292 35 55 299 26 24	Silver Crown Northport Mon, 179 Lake	14, 885, 5 21, 048, 2 3, 959, 8 11, 703, 0	4. 172764 4. 323215 3. 597678 4. 068297
Columbia	49 (117 :	03 26, 11 33 16, 94	25 45 10 43 15 26 49 46 10 54 18 23 81 44 27	205 42 51 223 05 45 229 41 34 234 04 13 261 35 49	Garden	8, 661. 6 22, 916. 3 9, 715. 3 28, 245. 2 14, 086. 8	3. 937600 4. 360145 3. 987456 4. 450944 4. 148813
Mon. 178		00 02, 70 41 46, 92	139 49 40 238 42 29 269 54 24 282 55 02	319 47 27 58 48 54 89 56 14 102 59 08	Lake Columbia Mon, 179 Garden	5, 554, 0 12, 116, 7 2, 948, 7 6, 776, 8	3. 744602 4. 083385 3. 469630 3. 831025
Mon. 182		00 02, 82 34 45, 00	52 20 48 90 01 06 90 01 50 109 17 06 195 53 26	232 19 35 269 55 48 269 58 21 289 09 35 15 54 33	Garden Mon. 178 Mon. 179 Lake Columbia	2, 492, 1 8, 576, 0 5, 627, 3 12, 874, 6 6, 529, 7	3. 396561 3. 933285 3. 750299 4. 109735 3. 814894
Mon. 183	49 (117 (00 02, 49 30 26, 54	78 12 58 90 05 50 90 06 37 90 08 16 103 48 22 151 11 33	258 08 30 269 57 17 269 59 53 270 05 01 283 37 35 331 09 24	Garden Mon, 178. Mon, 179. Mon, 182. Lake Columbia	7, 383. 5 13, 829. 4 10, 880. 7 5, 253. 5 17, 919. 3 7, 179. 7	3. 868263 4. 140804 4. 036658 3. 720445 4. 253322 3. 856103

Station	Latit	ude gitud		Azir	nutl	n	Back a	zim	ith	To station	Distance (meters)	Logarithm
Red Top	° 48 117	57	55. 44 14. 32	o 120 122 179	20 18 42	77 32 22 04	300 302		52 01	Lake Garden Columbia	16, 215, 1 4, 515, 8 10, 214, 8	4. 209919 3. 654731 4. 009232
Mon. 184.	49 117		01. 96 41. 17	90	44 03 11 18	13 43 28 26	270	58	49 01 52 42	Baldy Red Top Mon. 183 Columbia	8, 335. 0 10, 008. 6 5, 800. 5 11, 202. 4	3. 920908 4. 000374 3. 763463 4. 049312
Hooknose	48 117	56 25	39. 40 40. 62	52 179 180	09 53 26	19 51 43	232 359 0	07 53 26	55 50 49	Baldy Mon. 184 Kelly	6, 257. 6	3. 458930 3. 796405 4. 336570
Salmon Ridge	49 117	02 22	56. 42 37. 47	17 24	44 06	43 20	197 204	$\frac{42}{02}$	25 38	HooknoseBaldy	12, 227. 3 14, 690. 1	4. 087329 4. 167025
Mon. 189			59. 95 20. 50	58 130	42 16	21 53	238 310	36 12	04 54	Hooknose_ Salmon Ridge	11, 909. 4 8, 437. 2	4. 075892 3. 926199
Mon. 188			01. 42 03. 31	42 160	07 31	59 20	222 340	04 30	30 09	Hooknose Salmon Ridge	8, 411. 4 5, 734. 6	3. 924870 3. 758501
Nelson	49 117	02 22	33. 81 15. 38	20 26		59 18	200 206	50 50	24 19	HooknoseBaldy	11, 716. 4 14, 252. 8	4, 068793 4, 153901
Lomond	49 117		40. 25 43. 05	44 138	22 35	44 52	224 318		14 57	HooknoseNelson	10, 403. 4 4, 677. 8	4. 017175 3. 670042
Crescent	48 117	58 19	52. 10 22. 00	62 105 152 172	40 47	55 54 47 18	241 285 332 352		09 08 36 02	Hooknose Mon. 184. Nelson Lomond	8, 004. 9 7, 702. 1	3. 940744 3. 903357 3. 886611 3. 527431
Mon. 185	49 117	00 23	01. 62 23. 51	24 255 293	04 03 36	05 45 03	204 75 113	06	22 32 05	Hooknose Lomond Crescent	4, 636. 9	3, 835122 3, 666225 3, 729092
Mon. 186	49 117	00 22	01. 40 03. 67	90 177 247 303	15 06 12 03		270 357 67 123	06 14	02 27 03 44	Mon. 185 Nelson Lomond Crescent	4, 714. 2 3, 099. 9	3. 210266 3. 673405 3. 491342 3. 593570
Mon. 187			01. 42 13. 87	270	02	02	90	02	10	Mon. 188	214. 6	2. 331684
Mon. 190	48 117	59 14	58. 88 38. 46	63 65 90 119 139	28 35 27	48 51 41 16 32	243 245 270 299 319	20 33 21	04 32 39 14 17	Baldy Hooknose Mon. 189 Salmon Ridge Kelly	14, 809. 6 3, 293. 9 11, 170. 8	4. 246077 4. 170543 3. 517704 4. 048086 4. 310435
South Fork	48 117	57 09	40. 34 08. 80	80 84 119 122 134 254	38 35		260 264 299 302 314 74	33 28 31 41	23 59 24 18 00 51	Baldy Hooknose Nelson. Mon. 190. Kelly Snowy	20, 266. 6 18, 379. 0 7, 953. 1	4. 356937 4. 306780 4. 264323 3. 900538 4. 449293 4. 102987
Stags Leap			06. 60 10. 80	43 57 117 296 352			223 236 297 116 172	56 25 24	48 03 53 11 49	Mon. 190. Baldy. Kelly Snowy. South Fork	25, 232, 8	3. 900353 4. 401966 4. 323899 4. 176463 4. 006780
Mawer			36. 35 26. 51	210 323		33 13		43 32		Stags LeapSouth Fork		3. 732278 3. 830069
Bab			30. 65 23. 46	56	09	15	236	07	42	Mawer	3, 010. 8	3. 478676
Mon. 191	48 117	59 11	57. 76 57. 30	153 213	31 35		333 33	31 36	34 53	Mawer Bab	1, 331. 8 3, 445. 4	3. 124436 3. 537242
Mon. 192	48 117	59 09	56. 44 00. 56	106 149 166	56	00 37 14	286 329 346	55	24 35 21	MawerBabStags Leap	3, 362. 7	3. 639839 3. 526699 3. 781417
Dagon	49 117	00 07	50. 41 12. 74	21 52 86 107 139	08	19 38 05 13 57	232		17 08	South Fork Mon. 192 Mawer Bab Stags Leap	2, 753. 5 6, 391. 0 4, 069. 6	3. 801278 3. 43988 3. 805566 3. 60955 3. 744147
Mundy			05. 70 20. 57	119 163 203	15	43		13 14 05		Mawer Stags Leap Dagon	7, 771. 6	3. 758159 3. 890510 3. 546093
Mon. 193	48 117	59 08	55. 96 01. 76	90 135 210	42 27 38	50 55 08	270 315 30	42 26 38	05 08 45	Mon. 192 Bab. Dagon	4, 104. 5	3. 077429 3. 613262 3. 291164

Station		ide and citude	Azir	nuth	1	Back a	azim	uth	To station	Distance (meters)	Logarithm
Halma	6 48 5 117 0	, ,, 58 41.07 66 29.22	-30	59 35 45 53 15	01 05 31 23 40 19	239 288 317 320 331 347	57 33 42 52 12 30		South Fork Mundy Bab. Mon. 193. Stags Leap. Dagon	9, 357. 1	3. 573889 3. 378114 3. 849955 3. 474490 3. 971140 3. 611964
Great Butte		01 41.78 04 44.80	20 35 62 69 77 87 111 300	45 11 57 53 10 37	40 48 05 39 21 27 32 13	200 215 242 249 257 267 291 120	48 42 09 52 47 06 33 37	22 29 13 13 32 12 26 27	Halma South Fork Dagon Mon. 191 Mawer Bab Stags Leap Snowy	3, 398. 9 9, 357. 7 9, 596. 4	3. 776134 3. 963251 3. 531335 3. 971167 3. 982108 3. 838128 3. 852518 3. 899698
Mon. 194		59 56.85 04 17.79	277	12	07	97	16	00	Snowy	6, 336. 5	3, 801848
Monk		03 16, 49 00 50, 98	44 58 88 343	23 31	19 12 11 15	224 238 268 163	12 20 24 22	03 16 08 33	South Fork Great Butte Stags Leap Snowy	14, 497. 8 5, 577. 6 11, 370. 8 7, 269. 3	4. 161303 3. 746444 4. 055792 3. 861490
Little Snowy	48 5 117 0	58 25.11 00 06.41	119 174 210	15	06 31 44	298 354 30	58 14 01	56 58 28	Mon. 194 Monk Snowy	9, 046. 5	3. 766712 3. 956483 3. 371343
Mon. 195	48 5 117 0	59 57. 42 01 39. 71	89 284 326	50	09 56 30	269 104 146	40 52 22	10 50 41	Mon. 194 Snowy Little Snowy	3, 213. 2	3. 506939 3. 502294 3. 534648
Mon. 196	48 5 116 5	59 57.87 59 24.16		43 43	35 45 48 50	196 269 269 159	41 42 40 04	03 02 07 02	Little Snowy Mon. 195_ Mon. 194_ Snowy	2, 991. 3 2, 755. 2 5, 968. 4 887. 9	3. 475864 3. 440158 3. 775861 2. 948347
Continental		56 43, 53 55 34, 86	96 119 123 129 139 152	37 42 32 59	04 41 04 49 30 23	275 299 303 309 319 332	57 34 31 25 56 04	50 16 03 54 49 24	South Fork Little Snowy Stags Leap Great Butte Snowy Monk	16, 652. 3 6, 353. 2 21, 378. 8 14, 488. 1 6, 757. 4 13, 734. 9	4. 221475 3. 802990 4. 329983 4. 161011 3. 829778 4. 137825
Sack		01 09.62 58 09.53	21 97 140 339	05 05	13 37 46 50	201 277 320 159	29 00 03 04	29 38 44 47	Snowy Great Butte Monk Continental	3, 273. 6 8, 091. 7 5, 110. 1 8, 801. 1	3. 515030 3. 908040 3. 708433 3. 944537
Mon. 197	48 5 116 5	59 58.48 55 39.99	78 89 125	46	22 59 11	258 269 305	39 44 51	45 09 18	Snowy Mon, 196 Sack	4, 323. 8 4, 556. 7 3, 750. 3	3. 635864 3. 658647 3. 574063
Center	48 5 116 5	58 23, 28 52 32, 62	50 104 131	36	10 43 42	230 284 311	31	52 44 26	Continental Snowy Monk	4, 820. 8 8, 318. 3 13, 586. 7	3. 683119 3. 920033 4. 133115
Parch		01 41, 21 51 59, 89	58 65	33 15 34 38	45 35 49 17 04 06	186 238 245 250 262 285	27 10 28 33	21 28 25 41 25 25	Center Little Snowy Snowy Mon . 196 Sack Monk	6, 150. 5 11, 597. 0 9, 595. 0 9, 575. 8 7, 573. 0 11, 180. 5	3, 788912 4, 064345 3, 982044 3, 981173 3, 879265 4, 048463
Mon. 198	48 5 116 5	59 58.82 53 15.06	89 205 343	46		269 25 163	47	12 03 21	Mon. 196 Parch Center	7, 502. 6 3, 512. 7 3, 074. 8	3. 875209 3. 545638 3. 487823
Facer	49 0 116 4	01 21.78 16 53.60	51 95		11 34	231 275	17 28	55 43	Center Parch	8, 825. 7 6, 251. 3	3. 945749 3. 795973
Duff	49 0 116 4	11.17 15 20.46	59 96 99	33	18 56 57	239 276 279	23 28 48	52 55 47	Center Parch Facer	10, 201. 5 8, 167. 9 1, 920. 7	4. 008666 3. 912112 3. 283451
Nupe		00 49.90 9 07.64	114 250 261	06	11 15 24	294 70 81	21 07 55	01 56 15	Parch Facer Duff	3, 842. 0 2, 896. 0 4, 662. 7	3. 584558 3. 461804 3. 668640
Qua	48 5 116 4	59 40.27 8 58.88	135 175 219	27 16	58 20 39	315 355 39		41 13	Parch	5, 243. 0 2, 158. 3 4, 039. 3	3. 719578 3. 334107 3. 606302
Mon. 199	48 5 116 4		137	38	10 10	317 21	36 47 05	23 33 08	Parch Nupe Qua	4, 264. 8 1, 685. 6 994. 5	3. 629900 3. 226765 2. 997624
Mon. 200		9 59.46 7 15.02	124	15 42	31 29 32	304 9		06 45	Nupe	2, 768. 9 2, 580. 1 3, 213. 8	3. 442307 3. 411631 3, 507017
Mon. 201		9 59.60 5 15.46	108	54 15 22	03	269 288	53 12 22	04 08 08	Mon. 200 Nupe Duff	2, 430. 2 4, 967. 9 2, 213. 4	3. 385644 3. 696176 3. 345061

Station		itud ngiti	e and ide	Az	imu	th	Back	azir	nuth	To station	Distance (meters)	Logarithm
Saddle			01. 74 11. 42	106 108	, 15 20 02 01 54 39	01 51 13 04 38 14	267 286 287 302 353 7	11 57	56 05 26 01 06 52	Continental Snowy Center Monk Facer Duff	11, 478. 3 16, 464. 3 8, 153. 1 21, 298. 2 8, 078. 8 7, 774. 8	4. 059876 4. 216546 3. 911326 4. 328343 3. 907346 3. 89069
Wood			40.72 23.71	14 56 58 74 77 79 90 98	16 08 30 48 31 08 08 29	06 15 40 16 54 16 29 47	270	14 59 24 44 20 06 02 17	44 49 31 42 46 23 45 22	Saddle	8, 892. 2 16, 446. 5 11, 660. 0 5, 978. 6 18, 422. 9 3, 101. 0 9, 267. 2 20, 268. 0	3. 94900 4. 21607 4. 06669 3. 77660 4. 26535 3. 49149 3. 96694 4. 30681
Mon. 202			59, 69 34, 95	89 135 162	55 51 23	50 15 31	269 315 342	53 49 22	04 55 54	Mon. 200 Duff	4, 473. 2 3, 077. 9 3, 274. 6	3. 65062 3. 48826 3. 51515
Mon. 204			59. 81 02. 96	57 89 106	46 59 04	45 20 17	237 269 285	41 55 59	21 54 32	Saddle Mon. 202 Duff	10, 304. 6 5, 528. 5 7, 982. 0	4. 01303 3. 74260 3. 90211
Kabe	48 116	59 43	59. 62 31. 02	134 269		11 27	314 89	48 57	48 49	Duff Mon. 204	3, 135. 8 5, 448. 6	3. 49634 3. 73628
Prox			00. 26 55. 33	89 117	25 44	24 38	269 297	24 42	12 04	Kabe Duff	1, 944. 9 4, 709. 1	3, 28890 3, 67293
Mon. 203	48 116	59 41	59. 76 57. 78	252	43	27	72	43	29	Prox	52. 01	1, 71604
Airy		57 37	32, 73 29, 61	84 121 121 125 130 132 157		03 01 48 50 24 49	264 301 301 305 310 312 337	47 23 39 07 07 15 19	29 25 16 55 03 37 00	Saddle Mon. 202 Kabe Duff Prox Wood Mon. 204	10, 659. 1 8, 706. 2 8, 636. 9 11, 711. 9 7, 068. 6 11, 382. 1 4, 924. 1	4, 02772 3, 93982 3, 93635 4, 06862 3, 84933 4, 05622 3, 69232
Extra	48 116	57 37	38. 07 27. 93	84 124 131 156		17 15 44 53	263 304 311 336	55 22 31 10	42 19 30 42	Saddle Duff Wood Mon. 204	10, 709. 0 11, 645. 6 11, 297. 1 4, 786. 0	4. 02974 4. 06616 4. 05296 3. 67997
Smith	48 116	55 35	23. 070 49. 259	103 138 152	35 10 59	58 09 45	283 318 332	28 03 58	09 41 29	Saddle	13, 023. 8 15, 670. 1 4, 496. 0	4. 11473 4. 19503 3. 65282
Porthill	49 116	01 36	17. 825 49. 859	6 6 48 55 94 353	30 38 18 20 26 34	32 01 49 30 04 37.7	186 186 228 235 274 173	30 37 17 13 20 35	21	Extra Airy Mon. 204 Saddle Wood Smith	6, 832. 5 7, 000. 3 3, 622. 7 13, 890. 5 9, 247. 5 11, 028. 0	3. 83457 3. 8451 3. 55902 4. 1427 3. 96602 4. 04249
Baun	49 116		58. 90 43. 01	8 57	22 19	48 23	188 237	22 17	14 38	Extra Mon. 204	6, 270. 8 3, 379. 6	3. 79733 3. 52886
Mon. 205	48 116	59 36	59. 80 22. 61	16 90 167		02 19 33	196 269 347	52 59 12	13 18 17	Extra_ Mon. 204 Baun	4, 575. 3 3, 259. 3 1, 872. 1	3. 66042 3. 51312 3. 27233
Mon. 207	48 116	59 29	59. 77 53. 45	40 105	17 56	38 52	220 285		10 38	SmithPorthill		4. 0492 3. 9444
Mon. 208			00.75 17.65	53 100		35 58	233 280		24 00	Smith Porthill Porthill	14, 449. 1 13, 066. 3	4. 1598 4. 1161
Mon. 209	49 116		01. 35 44. 81	59 89 98 254 308	30 36	54 19 21	239 269 278 74 128	20 41	15 26 27	Smith	7, 493. 0 16, 127. 4 8, 548. 1	4. 2319 3. 8746 4. 2075 3. 9318 4. 2161
Hall	48 116	58 22	23, 38 01, 84	145 229 303	16	45	325 49 123		33	Mon. 209 Hawkins Hell Roaring	3, 680, 2 8, 113, 6 12, 975, 8	3, 5658 3, 9092 4, 1131
Shep	48 116	56 33	43.84 22.33	153 215 234 242	31 02 47	22 32 58	333 35 54 62	28 05 53	45 09 18	Porthill Mon. 207 Mon. 208 Mon. 209	9, 457. 3 7, 394. 5 10, 563. 7	3. 9757 3. 8689 4. 0238 4. 1217
Mon. 206.			59.75 32.26	269 269 269 346	46 57	20 47	89 89 90 166	01	18	Mon. 209_ Mon. 208_ Mon. 207_ Shep	10, 053. 4 5, 667. 1	4. 1192 4. 0023 3. 7533 3. 7935
Hall Lookout	48 116	57 21	43, 85 37, 34	76 82 109 220 299	42 42 56	34 25 46	255 262 289 41 119	30 00	42 57 16	Smith Shep Porthill Hawkins Hell Roaring	14, 462. 3 19, 693. 5	4. 25220 4. 16023 4. 29432 3. 93568 4. 07593

Station		itud ngiti	e and ude	Aziı	mut	h	Back a	zim	uth	To station	Distance (meters)	Logarithm
Mission			41. 69 50. 23	51 64 94 199 329	46 43 51 51 12		231 244 274 19 149		49 56 50 31 50	Hall Lookout Hall Mon. 209 Hawkins Hell Roaring	5, 880. 3 5, 659. 0 7, 233. 2 3, 052. 2 11, 145. 7	3, 769400 3, 752738 3, 859329 3, 484619 4, 047109
Mon. 210			02. 01 49. 22	12 25 89 244 279	55 51 41 20 46	03 46 42 39 06	192 205 269 64 99	54 50 39 23 48	27 51 30 33 22	Hall Lookout Hall Mon. 209 Hawkins Mission	4, 378. 5 3, 385. 6 3, 569. 2 5, 184. 9 3, 692. 0	3. 64132: 3. 52964: 3. 552570 3. 71474: 3. 56726:
Mon. 211			02, 27 32, 82		46 42 56	49 36 34	224 269 106	44 41 57	56 39 52	Hall Mon. 210 Mission	4, 302. 5 1, 552. 9 2, 180. 0	3. 63372 3. 19115 3. 33845
Harvey			33. 52 07. 13	96 106 182 332	57	44 02 36 08	276 286 2 152	03 57	44 29 42 07	Mon. 209_ Mission_ Hawkins_ Hell Roaring_	8, 129. 5 911. 7	3. 91006: 2. 95987: 3. 495124. 02115:
Border			05, 29 46, 93	79	36 30 41	40 56 52	182 259 292	36 27 38	23 40 42	Hell Roaring Harvey Hawkins	10, 317. 0 5, 379. 6 5, 555. 6	4. 013554 3. 730748 3. 744729
Mon. 214			02, 60 44, 62		28 31	19 43	260 330	25 31	00 41	HarveyBorder		3. 73330 1. 979840
Mon. 212.			02, 81 35, 22	89	39 45 03 46	09	215 269 90 157	38 39 06 49	45 38 03 13	Harvey_ Mon. 209_ Mon. 214_ Hell Roaring_	1, 113, 2 8, 732, 1 4, 687, 1 11, 048, 6	3. 046577 3. 941118 3. 670906 4. 043308
Harper			02. 18 10. 95	61	49 00 06 41	44	196 240 252 272	46 58 00 36	54 46 54 27	Hell Roaring Border Harvey Hawkins	3, 624. 5 8, 891. 0	4. 100426 3. 55924 3. 94894 3. 91926
Mon. 219	49 116	00 08	02, 56 15, 19	85 90	26 18 54 51	51 18	210 265 270 281	22 12 50 45	21 09 53 06	Hell Roaring Harvey	10, 850. 2	4. 073778 4. 03543 3. 74224 4. 03657
Perry	49 116	01 14	03. 07 45. 17	270 283 306 350	35	54 32	90 103 126 170	18 18 37 54	43 48 02 52	Harper Mon. 219 Border Hell Roaring	8, 142. 9	3. 746010 3. 91077 3. 47616 4. 08796
Mon. 213			03. 20 10. 30	159 267 270		18	339 87 90	01 49 36	47 21 54	Perry_ Border Mon. 214	1, 980. 8 1, 695. 7	3. 29683 3. 22936 3. 24094
Mon. 218			02. 21 37. 50		16 14		270 16	15 14		Mon. 214 Harper		3, 41224 3, 28546
Mon. 215			02. 18 35. 21	222 269	43 56	21 27	42 89	44 57	24 11	Harper Mon. 218	2, 523. 6 1, 172. 9	3. 40201 3. 06924
Mon. 216			02. 20 53. 82	89 205 - 269		46	269 25 89	57 11 55	02 18 48	Mon. 215 Harper Mon. 218	841. 2 2, 047. 6 331. 6	2. 92490 3. 31125 2. 52067
Mon. 217	49 116	00 10	02. 20 38. 82	89 269			269 89	57 30	49 34	Mon. 216	304. 8 26. 84	2. 48401 1. 42878
Mon. 220.			02. 80 28. 15		18	52	269 279 292 38 98		40 55 57 14 36	Mon. 219 Hawkins Harper Mahon Burke		3. 33762 4. 11442 3. 68890 4. 15960 4. 00557
Mon. 222			03. 29 53. 03	89 115 196 288	52 35	26	269 295 16 108	48 32 38 41	58 12 13	Mon. 220 Hunter Mahon Burke	5, 591. 9 6, 030. 8	3. 74755 3. 78037 4. 07195 3. 66965
Mon. 221			03. 15 40. 58	128 206 269	08	22 28 47	308 26 89	40 11 54	21 55 08	Hunter Mahon Mon. 222	12, 605. 3	3. 62013 4. 10055 3. 33965
Mon. 223	49 115	00 58	03. 54 16. 08	89 104 174	55 48	22 37 58	269 284 354	52 42 47	38 31 20	Mon. 222 Hunter Mahon	4, 409. 7 10, 185. 1 11, 348. 1	3. 64440 4. 00796 4. 05492
Mon. 224			03. 66 08. 89	68 89 156 235	18 57 52	59 50	248 269 336 55	16 55 49 24	38 28 27	Burke Mon. 223 Mahon Lodge	4, 077. 1 3, 804. 9	3. 61034 3. 58034 4. 08944 4. 07989
Mon. 229			03, 36 39, 02	32 90 148 234 278	42 06 56 24	41 36 15 38	212 269 328 54 98	40 57 53 30 38	50 55 41 54 12	Roswell Mon. 224 Lodge Bevis Wood	5, 534. 8 14, 022. 0 7, 990. 3 12, 432. 8 11, 929. 6	3. 74310 4. 14680 3. 90256 4. 09457 4. 07662

Station		ide and itude	Azimutl	n	Back az	zimu	th	To station	Distance (meters)	Logarithm
Speer		,,, 1 29.63 7 33.61	° ' 74 01 188 42 299 11 346 19		253 8 119	14 (Mon, 224 Lodge Mon, 229 Roswell	9, 625. 3 4, 226. 6 5, 461. 4 7, 536. 2	3. 983416 3. 625986 3. 737302 3. 877150
Mon. 227		0 03.60 7 53.09	90 03 188 28 188 36 270 03	26 17 34 21	8 8	28 3 37 1	57 32 13 33	Mon. 224 Speer Lodge Mon. 229	8, 857. 9 2, 687. 0 6, 913. 6 5, 164. 1	3. 947329 3. 429272 3. 839702 3. 712996
Mon. 225	49 0 115 5	0 03.71 3 31.14	89 57 148 55 229 06 249 53 269 59	41 49 51 39 38	328 49 69	51 3 11 4 58 (27 85 15 99	Mon. 224 Mahon Lodge Speer Mon. 227	1, 986. 8 13, 192. 7 10, 446. 3 7, 735. 0 6, 871. 1	3, 298146 4, 120333 4, 018963 3, 888460 3, 837025
Mon. 226.		0 03.71 1 37.56	90 01 219 17 241 48 270 01	02 13 28 05	39 61	20 4 51 3	36 11 32 54	Mon. 225 Lodge Speer Mon. 227	2, 308. 5 8, 831. 0 5, 623. 3 4, 562. 5	3, 36333 3, 94601 3, 74999 3, 65920
Mon. 228		0 03, 51 5 56, 42	90 04 143 25 168 57 270 04	38 21 56 58	323 348	24 (57 (10 08 07 12	Mon. 227 Speer Lodge Mon. 229	2, 371, 4 3, 313, 3 6, 967, 2 2, 792, 7	3. 37500: 3. 52025; 3. 84305; 3. 44603
Fork		1 50.86 9 06.46	59 04 229 31 292 19 309 09	50 02 41 56		33 5 26 (25 52 00 48	Mon. 229 Bevis Caribou Wood	6, 457. 7 6, 018. 5 11, 037. 7 8, 069. 4	3, 810076 3, 779490 4, 042880 3, 906839
Lick	48 5 115 3	9 01. 20 8 38. 43	107 28 173 47 203 39 268 32	32 55 46 50	353 23	47 3 42 1	16 34 15 21	Mon. 229 Fork Bevis Wood	6, 405. 5 5, 272. 0 9, 987. 8 5, 688. 2	3. 80655 3. 72197 3. 999468 3. 75497
Gold	49 0 115 3	1 04.43 1 24.93	40 28 98 44 269 39 304 25 343 21	48 45 06 12 12	278 89 124	38 4 44 2 30 1	51 57 23 18	Wood Fork Purcell Yaak Caribou	4, 817. 8 9, 485. 6 8, 514. 9 9, 989. 4 2, 889. 4	3. 682848 3. 977063 3. 930179 3. 999533 3. 460803
Wood Lookout	48 5 115 3	8 23.09 3 38.07	160 56 133 54 162 18 208 29 237 54 273 26	24 43 15 21 14 22	57	50 3 17 3 31 6 56 2	37 36 59 01 26	Lick Fork Wood Gold Carlbou Yaak	6, 220, 2 9, 259, 9 1, 383, 9 5, 671, 3 4, 171, 8 10, 968, 1	3, 793800 3, 966600 3, 141113 3, 753680 3, 620327 4, 040130
Mon, 236		0 02.05 1 03.73	63 58 167 23 256 15 295 28	37 51 04 24	347 76	23 3 20 0	25 35 05 14	Wood Gold	3, 960. 2 1, 974. 4 8, 322. 4 8, 650. 1	3. 597713 3. 295442 3. 920248 3. 937023
Mon, 235		0 02.52 4 35.88	90 11 121 21 172 48 270 10	27 25 34 15	301 352	18 (48 (37 01 00 55	Mon. 229 Fork Bevis Mon. 236	11, 039, 8 6, 436, 7 7, 309, 7 4, 312, 2	4. 04296; 3. 80866; 3. 86390; 3. 63469
Mon. 231		0 02.94 9 15.41	90 09 183 07 213 18 270 06 294 10	56 11 52 03 44	3 33 90	07 1 21 4 09 3	37 18 19 34 58	Mon. 229 Fork Bevis Mon. 235 Wood Lookout	5, 358. 2 3, 338. 8 8, 665. 3 5, 681. 7 7, 520. 3	3. 729018 3. 52358 3. 93778 3. 75447 3. 87623
Mon. 230		0 03.18 1 30.04	90 08 225 59 270 05 287 48	10 31 38 33	270 46 90 107	04	33 10 51 29	Mon. 229 Bevis	2, 621. 8 10, 416. 6 8, 418. 1 10, 081. 5	3. 41859 4. 017729 3. 92521 4. 00352
Mon. 233		0 02.94 8 38.91	170 28 270 07 296 43 359 42	14 22 41 16	90 116	10 2 47 2	53 26 28 17	Fork_ Mon, 235. Wood Lookout Lick	3, 380. 6 4, 939. 8 6, 850. 2 1, 907. 2	3. 528994 3. 693713 3. 835703 3. 280400
Mon. 232		0 02.94 8 53.32	90 00 175 25 270 01 286 24 295 39	05 17 24 03 54	355 90 106	25 0 01 3 27 4	18 17 14 16 16	Mon. 231 Fork Mon. 233 Wood Wood Lookout	448. 9 3, 344. 5 292. 9 6, 243. 2 7, 113. 1	2. 652197 3. 524328 2. 466678 3. 795406 3. 852058
Mon. 234		0 02.94 7 57.78	23 26 90 00 300 15	00 22 46	269	59 5	29 51 02	Liek Mon. 233 Wood Lookout	2, 078. 6 836. 2 6, 115. 0	3. 31776 2. 92228 3. 786398
Mon. 237		0 01. 54 7 50. 42	76 51 90 15 114 02	52 06 30	256 270	49 4 12 4	11	Caribou Mon. 236 Gold.	3, 628. 1 3, 929. 3 4, 772. 7	3. 559676 3. 59431 3. 678766
Mon. 238		0 00. 95 4 38. 41	0 26 90 17	10 26	180		9	Yaak Mon. 236	3, 691. 7 7, 832. 1	3. 56723 3. 893886
Mon. 239		0 00, 28 1 30, 96	46 18 90 19 119 42	14 37 26	270		5 4	Yaak_ Mon. 238 Purcell	5, 312. 2 3, 810. 2 4, 091. 9	3. 725277 3. 580951 3. 611926

Station		tude ngitu	e and ide	Azir	nut	h	Back a	zim	uth	To station	Distance (meters)	Logarithm
Mon. 240	° 48 115	59	59. 38 48. 00		31 22 17		246 270 284	26 17	77 32 23 58	Yaak_ Mon. 238_ Purcell	9, 131. 1 8, 342. 1 8, 342. 7	3. 960524 3. 921277 3. 921308
Sam	48 115		58. 91 07. 81	269 274 296	59 54 45	17 03 44	90 94 116	03 59 50	57 13 59	Mon. 245 Bowdich Campbell	7, 537, 6 8, 369, 3 9, 513, 9	3. 877233 3. 922690 3. 978357
Mon. 241			58. 81 41. 56	90	19	28	270	19	18	Sam	533, 44	2, 727086
Mon. 242			58. 83 37. 31	90 266 269	03 11 59	32 16 34	270 86 90	01 13 02	39 53 21	Sam Gateway Mon, 245	3, 058. 95 4, 230. 6 4, 478. 6	3. 485572 3. 626406 3. 651147
Mon. 243	48 115	59 10	58. 79 56. 49	253 289	34 38	05 34	73 109	34 39	40 49	GatewayBowdich	993. 1 2, 134. 2	2. 996991 3. 329245
Mon. 244	48 115	59 10	58. 79 16. 72	90 207 358	00 10 47	26 19 47	269 27 178	59 10 47	56 24 47	Mon. 243 Gateway Gateway north base	808. 4 315. 7 769. 0	2. 907622 2. 499320 2. 885923
Gateway azimuth station	48 115	59 10	58. 79 05. 86	90 164 306		20 55 48	269 344 126	59 44 12	42 52 24	Mon. 243 Gateway Bowdich	1, 029. 2 291. 1 1, 215. 3	3. 012483 2. 464040 3. 084689
Mon. 245	48 115	59 09	58. 79 56. 98	90 137 311	01 31 53	38 50 22	270 317 131	01 31 53	31 40 52	Gateway azimuth station Gateway Bowdich	180, 6 380, 9 1, 074, 8	2, 256688 2, 580762 3, 031341
Scott	49 115	00 03	33, 98 42, 83	51 127	07 39	06 37	231 307	$\frac{02}{34}$	$\frac{59}{02}$	Campbell Frost	8, 554. 9 11, 391. 0	3. 932216 4. 056562
Flatiron	48 115		39. 63 48. 86	74 139 181	17 42 59	55 30 08	254 319 1	13 36 59	52 59 13	Campbell Frost Scott	6, 790. 3 13, 755. 4 3, 534. 7	3. 831890 4. 138472 3. 548353
Mon. 246	48 115		58. 83 28. 28	37 252 307	32 05 01	06 16 57	217 72 127	30 07 03	21	Campbell Scott Flatiron	5, 406. 6 3, 533. 6 4, 061. 1	3. 732920 3. 548220 3. 608641
Kiln	48 115		48, 19 56, 08	26 62 94 130 146	34 22	41 57	206 242 274 309 326	27 20 56	59 17 28	Flatiron Campbell Mon. 246 Frost Scott	4, 325, 8 13, 018, 7	3, 375516 3, 933304 3, 636069 4, 114568 3, 231497
Mon. 247 ecc	48 115		58. 77 19. 10	13 156 304	05	41	193 336 124	53 05 56	23	Flatiron Scott Kiln	1, 189. 8	3. 401152 3. 075481 2. 756517
Mon. 247	48 115	59 03	58, 77 15, 57	90	02	09	270	02	06	Mon. 247 ecc	71.84	1.85634
Mon, 248			59. 53 47. 81	69 89 120 195	53 13	27 41	249 269 300 15	05	24 08	Campbell Mon. 246_ Frost_ Baldy	8, 140. 1 15, 957. 6	4, 087108 3, 910632 4, 202969 3, 698838
Mon. 249	48 114		59, 83 17, 50	89 174		17 41	269 354		08 21	Mon. 248Baldy		3. 263794 3. 682847
Mon. 250			00. 36 19. 74	89 139 254 278	36 40	22 25	269 319 74 98	33 47	51 53	Mon. 248 Baldy Wig Tuchuck	6, 277. 5	3. 736305 3. 797785 4. 097286 4. 263954
Mon. 251			00. 77 42. 71	89 123 249	47 19 40	32	303	15	28 02 49	Mon. 250 Baldy Wig	3, 191. 8 8, 685. 3 9, 465. 5	3. 504040 3. 938785 3. 976144
Mon. 252			01. 00 00. 19	89 117 244 281	02 14	39 28	296 64	45 56 18 44	52 40	Mon. 250. Baldy. Wig. Tuchuck.	10, 485. 6 7, 543. 0	3, 722269 4 020592 3, 877546 4, 119503
Mon. 253			01. 37 43. 19	89 220				49 34	02 28	Mon. 252 Wig	4, 004. 2 4, 294. 4	3. 602519 3. 632907
Mon. 254			01. 54 03. 81	193 291	20 16		13 111		08 53	Wig Tuchuck	3, 347. 7 7, 373. 8	3. 524755 3. 867693
Mon. 255			01. 54 30. 71	90	00	20	269	59	55	Mon. 254	672, 59	2. 827748
Muchuek	49 114	00 40	29. 01 49. 17	277 352				48 22	02 23	Hefty Tuchuck	8, 025. 2 3, 560. 1	3. 904454 3. 551460
Bud			00. 72 32. 09	255 271 305			91	07	28	Muchuck Hefty Tuchuck	11, 265, 9	3. 534617 4. 051764 3. 664940
Mon. 256			01. 95 33. 80	271 305 317	09	41	125	12	02	Hefty Tuchuck Bud	4, 673. 3	4, 053123 3, 669628 1, 710820

Station	Lati	itud	e and ide	Azi	mut	h	Back a	zim	uth	To station	Distance (meters)	Logarithm
Mon, 257.	49	00	02. 57 13. 44		, 12 45 21	35 01 38	269 269 318	, 10 42 21	05 30 11	Bud Mon. 256 Muchuck	4,072.5	3. 60618 3. 60986 3. 03858
Mon. 258	49 114		03. 09 12. 76	55 89 274	14 46 32	06 43 00		11 41 34	40 56 12	Tuchuck Mon. 256 Hefty	7,745.0	3. 67957 3. 88902 3. 55202
Mon. 259		00 34	03. 46 23. 87	89 337	49 43	43 25	269 157	47 43	36 30	Mon. 258	3, 432. 8	3. 53565 2. 50234
Mon. 260			03. 74 57. 08	83 244 285	54	26 32 47	263 65 106	56 03 09	40 27 05	Hefty Kishenehn Kintla	15, 864, 1	3. 45927 4. 20041 4. 35003
Mon. 261			04. 04 40. 44	87 89 89 289	25 53 53 23	46 17 17 13	267 269 269 109	21 50 48 34	31 49 58 02	Hefty Mon. 260 Mon. 259 Kintla	6, 867. 2 3, 996. 8 6, 980. 5	3. 83678 3. 60170 3. 84388 4. 26908
Mon, 262			04. 03 47. 18	87 90 234 290	47 01 10 34	30 08 53 12	54	42 00 16 44	35 28 39 21	Hefty_ Mon. 261_ Kishenehn Kintla	1, 082. 6 11, 461. 5	3. 90030 3. 03447 4. 05924 4. 24462
Mon. 263	49 114	00 24	04. 08 50. 64	88 89 220 295		07 37 04 19	268 269 40 115	22 57 29 49	59 23 36 16	Hefty Mon. 262. Kishenehn Kintla	8, 803. 9	4. 06202 3. 55487 3. 94467 4. 15417
Mon. 264			04. 08 21. 30	88 90 210 299		23 28 52 36	268 269 30 119	35 59 13 23	07 21 17 25	Hefty Mon. 263. Kishenehn Kintla	7, 750. 1	4. 12550 3. 25911 3. 88930 4. 10208
Sub-265			04. 15 13. 85	89 200 302	40	06 25 01	269 20 122	41		Mon. 264. Kishenehn Kintla	7, 157, 4	3. 13702 3. 85475 4. 05974
Mon. 266			04. 09 39, 41		00 10 15	25 00 46	269 270 15	59 09 16	08 34 54	Mon. 264 Sub-265 Kishenehn	700.0	3. 31617 2. 84509 3. 84155
Mon. 265			04. 08 03. 78	90 90 269	36	35 26 38	269 270 89	59 36 58	36 19 57	Mon. 264 Sub-265 Mon. 266	204, 55	3. 19741 2. 31079 2. 69499
Mon, 267			03. 14 13. 24	90 170 315	23	30 08 22	270 350 135	18 22 54	22 25 04	Mon. 264 Kishenehn Kintla	5, 042, 0 6, 823, 3	3. 70260 3. 83399 3. 93415
Point Edward			21. 49 24. 98	54	43 15	28 41 20 02	234 254 313 163	41 10 21	21	Mon. 267 Mon. 264 Kishenehn Kintla	4, 189. 3 8, 791. 6 6, 270. 5	3. 62213 3. 94406 3. 79730 3. 95239
Mon. 268			01. 60 33. 90	90 90 157		45 06 38	270 270 337	24 35 11	52 20 00	Mon. 264 Mon. 267 Point Edward	9, 500. 6 4, 458. 6 2, 677. 4	3. 97775 3. 64919 3. 42771
Sub-269	48 114	59 12	57. 19 00. 43	25 124 208 274	52 28	14 54 46 17	205 304 28 94	12 46 31 36	54	Kintla Kishenehn North Divide South Divide	6, 614. 9 12, 100. 1 10, 574. 1	3. 82052 4. 08278 4. 02424 3. 99964
Mon. 269			59, 98 59, 37	115 124	03 02 29 36	15	194 294 304 28	58 23	23 46 05 09	Sub-269 Point Edward Kishenehn North Divide	5, 955. 9 12, 068. 8	1. 94910 3. 77494 4. 08166 4. 02069
Akamina	49 114	01 08	20.08 13.18	61	04 01 39		221 240 3		15 16 53	Kintla Sub-269 North Divide	5, 280, 5	4. 05419 3. 72267 3. 82901
Mon. 270			59. 38 45. 45	231	28 53 07 47	44	51	27 55 09 52	22 26 39 21	Sub-269 North Divide-Akamina. South Divide-	1, 525, 5 9, 874, 8 3, 973, 8	3. 18342 3. 99452 3. 59920 3. 92838
Goat	48 114	59 07	57. 68 21. 77	90 157	44 41	50 27	270 337	42 40	16 48	Mon. 270Akamina	4, 140, 5	3. 61705 3. 43956
Mon. 271	48 114	59 07	57. 89 42. 74	166 270	18 52	39 45	346 90	18 53	16 01	AkaminaGoat	2, 613, 1	3. 41716 2. 62973
Mon. 272	48 114	59 04	56.00 01.96	90	42 15 46 49	58 12	244 270 270 162	09 41	57	Kintla Sub-269 Mon. 270. South Divide	13, 887. 7 9, 725. 6 8, 202. 1	4. 14262 3. 98791 3. 91392 2. 89891
Red Mountain			19. 00 40. 51	85	47 03 48 15	16 15	237 264 342 123	58 46	29 36	Kintla Sub–269 North Divide South Divide	12, 470. 8 7, 751. 4 9, 022. 6	4. 09589 3. 88938 3. 95533 3. 42735

GEOGRAPHIC POSITIONS OF TRIANGULATION STATIONS AND MONUMENTS, SUMMIT OF ROCKY MOUNTAINS TO LAKE OF THE WOODS, MINOR SCHEMES

Station		tude igitu	and ide	Azir	nutl	1	Back a	zim	uth	To station	Distance (meters)	Logarithm
Mon. 273	48	59	55. 89 30. 18		, 13 06 01 50		245 270 324		04 36 51 49	South Divide	1, 797. 5 1, 865. 6 11, 392. 9 7, 976. 0	3. 254664 3. 270822 4. 056634 3. 901784
Mon. 274		59 58	55, 60 26, 40	83 90 310	35 07 44	09 54 14	263 270 130	31 04 45	05 50 54	South Divide	6, 629, 5 4, 955, 4 3, 532, 7	3. 821478 3. 695075 3. 548105
Mon. 275			55. 45 16. 07	85 90 90 359	28 06 08 20	$02 \\ 41 \\ 33 \\ 12$	265 270 270 179	22 05 03 20	19 03 50 13	South Divide Mon. 274 Mon. 273 Campbell S. W	2, 649, 0	3. 966906 3. 423083 3. 881063 3. 362048
Campbell No. 1			54. 22 48. 04	52 96 148	58 44 56	12 49 37	232 276 328	57 38 54	52 45 53	Campbell S. W South Divide Waterton	680. 7 9, 875. 6 5, 437. 0	2. 832958 3. 994563 3. 735357
Cleveland	48 113	55 50	29. 66 50. 07	115 130 131 141 201 243 267	16 18 50 06 18 01 03	55 54 43 40 01 59 40	295 310 311 321 21 63 87	07 06 46 01 20 06 14	07 03 38 11 51 04 27	South Divide	27, 195. 6 8, 863. 3 14, 110. 3 12, 608. 1	4. 244162 4. 434498 3. 947596 4. 149533 4. 100648 3. 871168 4. 242968
Mon. 277		59 52	54. 61 12. 64	65 90 348	12 19 23	55 32 38	245 270 168	09 16 24	52 28 40	Campbell S. W	4, 948. 3	3. 734249 3. 694452 3. 921956
Mon. 276	48 113	59 54	55. 32 18. 27	44 90 270 332	02 06 28 40	51 37 36 52	224 270 90 152	01 05 30 43	44 08 10 30	Campbell No. 1	2, 394. 7 2, 553. 6	3. 41922 3. 37924 3. 40715 3. 96542
Belly East	48 113	57 44	15, 73 56, 90	162 231	58 25	09	342 51	56 30	33 46	SofaRim		3. 94729 4. 07652
Chief North	48 113	56 35	43, 86 31, 53	94 123 165 229 255	55	05 40 51 27 20	274 303 345 49 75	49 46 33 16 25	57 30 44	Belly East	16, 968. 0 8, 689. 2 13, 398. 6	4. 06241; 4. 22963 3. 93897; 4. 12705; 3. 97935;
Gus			44, 52 16, 15	27 149 298	38 08 31	37 19 59	207 329 118	37 06 37	46 12	Belly Sofa Chief Mountain	2,994.1	3. 47627 3. 82420 4. 03197
West	48 113	59 42	56. 77 35. 44	42 122	32 35	28 49	222 302	31 32		GusSofa		3. 48125 3. 81224
Jack			45. 41 07. 24	54 63 74 100 347	33 36 23	53 55 57 28 55	234 243 254 280 167	33	16 35 42	Belly Gus West Sofa Chief Mountain	8, 377. 6 5, 654. 2	4. 03925 3. 92311 3. 75237 4. 04524 3. 95879
Mon. 278			53. 70 26. 28	90 218 263 269 288 314	43 19 18 41	33 23 28	270 38 83 89 108 134	27 45 28 23 45 16	09 06 33 22	Mon. 277 Sofa Jack West. Gus Belly	4, 600. 5 13, 892. 9 8, 351. 4 6, 657. 5	3, 52914 3, 66280 4, 14279 3, 92176 3, 82331 3, 83663
Mon. 280			51. 41 36. 55		31 44 01	18		44		Mon. 278 West	167. 05	3, 92058 2, 22283 3, 75755
Mon. 279			52, 64 08, 45	90 268 270 312	17 28	22 56	270 88 90 132	20 31	36	Mon. 278. West. Mon. 280 Gus.	4, 331. 6 4, 307. 5	3. 60437 3. 63664 3. 63422 3. 49206
Mon. 281			51. 08 37. 75	57 90 248	29	09	237 270 68	28	24	Gus Mon. 280 Jack	1, 195. 2	3, 58216 3, 07745 3, 66236
Mon. 282			51. 96 59. 94	72 89 91 110 212	32 57 20	03 52 45	252 269 271 290 32	30 55 14	04 09 39	Gus	3, 208. 1 4, 383. 1 10, 500. 6	3. 82981 3. 50624 3. 64178 4. 02121 3. 29408
Mon. 283			52. 77 31. 52	0 159	00 52		180 339			Chief MountainRim		3, 86082 3, 43886
Mon. 284			53, 30 53, 47	89 89 112	15	27 09 14 11		31 30 12	13 03 48 22	Chief Mountain	1, 993. 1 5, 010. 1 4, 254. 5 3, 898. 5	3. 8775 3. 2995 3. 6998 3. 6288 3. 5908 3. 9601

SUMMIT OF ROCKY MOUNTAINS TO LAKE OF THE WOODS, MINOR SCHEMES—Continued

Station			e and ude	Azi	mut	h	Back	nzin	nuth	To station	Distance (meters)	Logarithm
Mon. 285	48	59	53, 04 00, 82	22 90	53 25 42 56	20 38 04	The second second	51 24 39	35	Chief Mountain Mon. 284. Rim Pike	1, 070. 3 4, 761. 3	3. 896892 3. 029495 3. 677727 3. 910520
Mon. 286			52. 33 33. 55	90	56 26 21 04 53	03 34 45	219 270 290 61 127	24	12 14 02	Chief Mountain Mon. 285. Rim Police. Pike	2, 993. 6 7, 465. 1	3. 975230 3. 476192 3. 873037 3. 782449 3. 744720
Mon. 287			52, 58 35, 26	49 89 105 224 329	48	05	229 269 285 44 149	48 19	08 15 54	Chief Mountain Mon. 286. Rim Police. Pike	2, 404. 5 9, 753. 1	4. 047213 3. 381023 3. 989143 3. 614534 3. 596812
Mon. 288	48 113	59 27	52. 84 35. 37	7 56 89 189	38 24 49 04	41	187 236 269 9	38 17 48 04	28 27 10 30	Pike Chief Mountain Mon. 287 Police	13, 101. 3	3. 539092 4. 117315 3. 386877 3. 469703
Mon. 289	48 113	59 25	52. 95 54. 05	60 89	17 48 54 18 12	35 49	120	40 53	34 33 18	Pike Chief Mountain Mon. 288 Spider St. Mary south base	2, 059, 6	3. 629285 4. 172093 3. 313780 3. 941187 3. 646296
Mon. 290	48 113	59 23	53. 17 13. 64		16 16 53 55	56 52	186 239 269 135	13 51	21 51	St. Mary south base	3, 380. 8 6, 727. 8 3, 260. 6 6, 148. 6	3. 529019 3. 827874 3. 513302 3. 788778
Rankin			29. 37 19. 52	261 342	21 15	00 44	81 162	23 17	57 06	373-S Galbreath	4, 804. 0 7, 167. 6	3. 681602 3. 855375
Arnold	49 113	01 16	12. 94 24. 58	19 304 353	14 17 56	59	199 124 173	13 20 56	14	Rankin 373-S Galbreath	3, 388. 8 4, 397. 2 10, 083. 2	3. 530048 3. 643176 4. 003599
Mon. 291	48 113	59 20	53. 38 42. 59	68 89	38 46 54 09 47	39 46 47	225 248 269 100 164	41 50 12	10	St. Mary south base	9, 500. 4 6, 331. 0	3. 682492 3. 977743 3. 801474 3. 622629 3. 661495
Lorin	48 113	59 19	17. 90 28. 52	5 77 126	$\frac{12}{16}$	10 22 22	185 257 306	09	59 57 26	Spider Pike Mon, 291	3, 343. 9 10, 623. 7 1, 862. 4	3. 524249 4. 026276 3. 270065
Lem	48 113	59 17	17. 07 40. 03	142 257 338	56	57	322 78 158	22 00 03	49 09 17	St. Mary	5, 372. 7 5, 282. 5 6, 951. 6	3. 730195 3. 722838 3. 842086
Mon. 292			53. 53 53. 42	32 72 89 230 291	57 44 53 56 20	54 31 17	212 252 269 50 111	38 52 58	19 04 09 09 47	Lorin Fike Mon. 291 Arnold Rankin	11, 598. 4 2, 219. 1	3. 117822 4. 064399 3. 346185 3. 590457 3. 311609
Mon. 293	48 113	59 17	53. 67 11. 04	12 75 89 128 201 270	56 21 54 58 04 21	04 07 18 47	192 255 269 308 21 90	55 12 51 55 05 24	56 28 55 23	Rankin Pike Mon. 291 St. Mary Arnold 373-S	770. 1 13, 600. 9 4, 300. 0 4, 972. 4 2, 624. 7 4, 577. 1	2. 886556 4. 133567 3. 633470 3. 696568 3. 419082 3. 660588
Mon. 294			53. 79 33. 61	66 70 118 157 270	$11 \\ 41 \\ 07 \\ 02 \\ 44$	37 58 54 48 12	250 298 337	$10 \\ 40 \\ 04 \\ 02 \\ 45$	17 10	Lem Rankin St. Mary Arnold 373–S	2, 809. 1 2, 281. 3 6, 628. 2 2, 655. 5 2, 596. 7	3. 448565 3. 358191 3. 821397 3. 424139 3. 414424
Mon. 295	48 113		53. 95 24. 31	18 39 89 297	56 13 54 54	42 51 19 52	198 219 269 117	55 13 52 58	06 50 41 48	Galbreath_ 373-S Mon. 294 Stack	8, 020. 6 50. 3 2, 628. 3 7, 212. 5	3. 904207 1. 701491 3. 419674 3. 858086
Mon, 296	48 113	59 12	54. 04 26. 72	26 88 89 303	27 01 52 01	28 41 47 02	206 268 269 123	00 52	08 57 04 15	Galbreath 373–S Mon, 295 Stack	8, 475. 8 1, 203. 3 1, 170. 7 6, 203. 7	3. 928179 3. 080356 3. 068455 3. 792653
Mon. 297	48 113		54, 24 20, 39	39 89 322	53 52 09	58 37 17	219 269 142	50 51 10	03 02 55	Galbreath	9, 895. 8 2, 567. 8 4, 290. 7	3. 995452 3. 409561 3. 632533
Mon. 298	48 113		54. 41 25. 59	48 89 263 354	49 52 05 59	55 43 19 29	228 269 83 174	44 51 08 59	33 17 52 40	Galbreath Mon. 297 Milk Stack	11, 536, 4 2, 333, 6 5, 764, 5 3, 407, 3	4. 062071 3. 368030 3. 760759 3. 532414
Mon. 299			54. 57 14. 50	34 89 89 257	52 40 54 20	30 02 39 38	214 269 269 77	51 34 53 22	02 37 00 31	Stack 373-S Mon. 298 Milk	4, 142. 6 8, 768. 7 2, 664. 5 3, 134. 5	3. 617274 3. 942935 3. 425623 3. 496173

Station	Latitud		Azimuth	Back azimuth	To station	Distance (meters)	Logarithm
Mon. 300	6 / 48 59 113 03	54. 74 48. 36	57 30 22 89 54 42 187 22 17 264 04 30 347 54 31	237 27 04 269 52 52 7 22 20 84 10 06 167 55 43	Stack Mon. 299 Milk Bunch Lincoln	6, 332. 6 2, 970. 7 686. 2 9, 100. 5 9, 380. 5	3. 801580 3. 472859 2. 836471 3. 959063 3. 972227
Mon. 301	48 59 113 02	54. 86 12. 29	89 53 52 262 30 55 359 56 35	269 52 40 82 35 19 179 56 35	Mon. 300 Bunch Lincoln	1, 952. 6 7, 160. 6 9, 176. 6	3. 290619 3. 854947 3. 962681
Mon. 302	48 59 112 59	55. 08 21. 76	20 39 50 89 54 21 255 45 11	200 37 41 269 52 12 75 47 26	Lincoln Mon. 301 Bunch	9, 813. 6 3, 466. 5 3, 749. 0	3. 991829 3. 539888 3. 573912
Mon. 303	48 59 112 57	54. 80 07. 44	34 03 03 90 12 03 94 51 20 224 10 20	213 59 14 270 10 22 274 46 21 44 10 54	Lincoln Mon. 302 Milk Bunch	11, 068, 9 2, 730, 2 8, 089, 3 1, 297, 2	4. 044103 3. 436198 3. 907910 3. 113008
Mon. 304		54. 57 22. 89	0 39 28 89 59 12 127 31 10 240 01 54 301 58 44 302 01 25	180 39 27 269 58 18 307 30 25 60 04 31 122 00 43 122 03 25	Gap Boundary west base Bunch. Bluff Ridge (U. S. C. & G. S.) Ridge (M. S. C. & G. S.)	1, 773. 6 1, 448. 2 1, 539. 4 4, 874. 8 3, 801. 9 3, 803. 9	3. 248848 3. 160840 3. 187352 3. 687959 3. 579997 3. 580231
Mon. 305	48 59 112 53	54. 64 18. 76	55 05 51 89 57 47 104 02 39 214 58 35	235 04 17 269 56 13 284 00 20 34 59 38	Gap Mon. 304 Bunch Bluff.	3, 102, 3 2, 523, 1 3, 859, 0 2, 967, 5	3. 491684 3. 401936 3. 586476 3. 472387
Mon. 306	48 59 112 51	54. 71 16. 75	41 21 16 89 57 36 162 14 27	221 20 10 269 56 04 342 13 58	Ridge Mon. 305 Bluff	2, 694. 0 2, 480. 1 2, 550. 6	3. 430401 3. 394473 3. 406638
Basin		44. 73 37. 40	92 07 09 136 57 16 148 39 19 256 20 31	272 04 48 316 56 01 328 37 36 76 23 12	Ridge Mon. 306 Bluff Center	3, 802. 8 2, 958. 6 5, 376. 1 4, 449. 6	3. 580106 3. 471092 3. 730471 3. 648320
Mon. 307	48 59 112 49	54. 78 20. 18	64 00 44 89 57 38 127 39 15	243 58 10 269 56 10 307 37 18	Ridge Mon. 306 Bluff	4, 617. 1 2, 369. 4 3, 974. 1	3. 664367 3. 374637 3. 599235
Mon. 308		54. 85 25. 98	50 58 50 72 38 32 89 57 23 259 31 52 304 04 01	230 57 11 252 34 32 269 55 57 79 33 37 124 05 03	Basin Ridge Mon. 307 Bench Center	3, 439, 7 6, 781, 4 2, 321, 5 2, 894, 9 1, 994, 1	3, 536522 3, 831319 3, 365768 3, 461636 3, 299740
Mon. 309	48 59 112 45	54. 93 33. 42	29 37 03 77 00 09 89 57 15 226 54 41	209 36 40 256 54 44 269 55 50 46 55 02	Center Ridge Mon. 308 Bench	1, 287, 8 8, 991, 6 2, 287, 8 765, 6	3, 109837 3, 953836 3, 359421 2, 884014
Mon. 310	48 59 112 43	55. 07 27. 76	9 27 28 239 36 41 303 08 05	189 26 55 59 38 44 123 11 19	South Table Bend	5, 464. 1 3, 846. 0 6, 244. 0	3. 737516 3. 585012 3. 795461
Mon. 311	48 59 112 41	55. 20 36. 23	30 25 29 89 54 38 96 54 20 319 06 42	210 23 32 269 53 14 276 51 42 139 08 32	South Mon. 310 Bench Bend	6, 254, 2 2, 267, 1 4, 292, 9 4, 522, 1	3. 796172 3. 355475 3. 632755 3. 655343
Mon. 312		55. 28 25. 03	89 57 38 140 12 15 355 07 50	269 55 59 320 11 15 175 08 01	Mon. 311 Table	2, 667. 0 2, 522. 8 3, 434. 3	3. 426016 3. 401880 3. 535842
Mon. 313		55. 36 25. 31	32 02 50 89 57 29 115 34 42 287 30 45	212 01 31 269 55 59 295 32 12 107 36 55	Bend	4, 039, 4 2, 433, 4 4, 487, 0 10, 464, 4	3. 606318 3. 386217 3. 651959 4. 019716
Mon. 314	48 59 112 35	55. 41 35. 25	51 59 41 89 58 07 107 08 16 292 10 08	231 56 59 269 56 44 287 04 23 112 14 55	Bend Mon. 313. Table Antelope	5, 561. 2 2, 237. 2 6, 575. 7 8, 358. 9	3. 745168 3. 349705 3. 817940 3. 922149
Mon. 315	48 59 112 33	55. 47 48. 58	62 24 30 89 57 55 299 32 55	242 20 27 269 56 34 119 36 21	Bend Mon. 314 Antelope	7, 392. 2 2, 168. 2 6, 464. 5	3. 868772 3. 336094 3. 806488
Mon. 316.	48 59 112 31	55. 49 49. 12	69 08 52 89 59 54 274 51 17 315 10 23	249 03 19 269 58 24 94 57 07 135 12 20	Bend Mon. 315. Line Antelope	9, 610. 7 2, 428. 3 9, 465. 8 4, 456. 8	3. 982755 3. 385296 3. 976156 3. 649026
Mon. 317	48 59 112 29	55, 52 36, 48	89 59 46 276 49 22 352 00 16	269 58 06 96 53 32 172 00 33	Mon. 316. Line Antelope.	2, 696, 1 6, 783, 3 3, 193, 7	3. 430744 3. 831442 3. 504297
Mon. 318	48 59 112 28	55. 22 17. 50	20 13 49 90 20 11 278 50 48	200 13 06 270 19 11 98 53 58	Antelope Mon. 317 Line	3, 360. 7 1, 605. 5 5, 191. 4	3. 526430 3. 205598 3. 715282

SUMMIT OF ROCKY MOUNTAINS TO LAKE OF THE WOODS, MINOR SCHEMES—Continued

Station		ude and gitude	Azimuth	Back azimuth	To station	Distance (meters)	Logarithm
Mon. 319	48	, ,, 59 54.78 26 18.41	0 ' '' 48 47 25 90 20 04 286 11 29	0 / // 228 45 12 270 18 34 106 13 10	Antelope Mon. 318 Line	4, 764. 2 2, 420. 7 2, 820. 5	3. 677999 3. 383942 3. 450322
Mon. 320		59 55. 33 23 32. 48	89 43 44 89 59 47 176 18 32	269 41 39 269 56 12 356 18 23	Mon. 319 Mon. 318 Foot	5, 793. 4	3, 527994 3, 762933 3, 59650
Mon. 321	48 112	59 55, 30 21 10, 49	76 02 01 90 01 45 307 31 58 353 20 02	256 01 02 269 59 58 127 34 42 173 20 13	Track Mon. 320 Corner Clear	5, 578. 7	3. 209176 3. 460329 3. 74653 3. 41665
Rain		59 59. 25 19 47. 34	27 04 52 81 04 37 128 22 06 213 38 36	207 04 00 261 02 36 308 19 07 33 40 02	Clear Track Foot Lake	3, 301. 0 6, 156. 9	3. 48409 3. 51864 3. 78936 3. 62201
Mon. 322	48 112	59 55, 31 20 00, 36	23 25 31 82 34 51 90 00 12 245 14 53	203 24 49 262 33 00 269 59 19 65 15 03	Clear Track Mon. 321 Rain	3, 021. 8 1, 425. 5	3. 45106: 3. 480266 3. 15397- 2. 46432:
Quartz	49 112	00 12.31 14 39.83	41 54 14 159 16 59 267 42 56 302 27 32	221 52 04 339 16 18 87 48 27 122 31 09	Corner Horse Red Cairn	3, 090, 8	3. 72206 3. 49006 3. 95026 3. 84051
Mon. 323	48 112	59 55, 31 17 51, 83	90 00 43 92 59 01 179 35 03 262 18 59 353 34 01	269 59 06 272 57 34 359 35 02 82 21 24 173 34 16	Mon. 322 Rain Lake Quartz Corner	2, 351. 1 3, 608. 1 3, 937. 8	3. 41706; 3. 37127; 3. 55727; 3. 59525; 3. 53428;
Mon, 324		59 55, 30 16 03, 35	90 00 53 90 01 32 91 33 31 148 17 12	269 59 31 269 58 33 271 30 42 328 15 49	Mon. 323 Mon. 322 Rain Lake	4, 817. 6 4, 554. 7	3. 34342 3. 68283 3. 65845 3. 62756
Mon. 325		59 55, 30 14 16, 44	90 01 03 137 52 21 264 02 34 300 44 12	269 59 42 317 52 04 84 07 47 120 47 31	Mon. 324 Quartz Red Cairn	708. 6 8, 481. 3	3. 33707 2. 85037 3. 92846 3. 79561
Miller	48 112		30 45 42 222 10 44 276 49 25	210 44 58 42 11 54 96 54 00	Cairn Red Cliff	2,820.0	3. 36235 3. 45024 3. 87332
Mon. 326		59 55, 28 11 48, 32	90 01 31 98 35 55 260 49 03 288 57 46 323 35 01	269 59 39 278 33 46 80 52 24 108 59 57 143 36 28	Mon. 325 Quartz. Red Miller Cairn	3, 010. 8 3, 525. 5 5, 495. 6 3, 735. 8	3. 47868 3. 54721 3. 74001 3. 57237 3. 59868
Mon. 327	48 112	59 55. 27 09 31. 47	90 01 16 94 49 58 114 56 38 328 16 52	269 59 33 274 46 05 294 52 05 148 17 20	Mon. 326 Quartz Horse Miller	6, 289. 6 8, 114. 2	3. 44430 3. 79862 3. 90924 3. 15472
Mon. 328		59 55. 27 07 42, 73	50 14 46 90 00 39 90 01 45 289 27 15	230 13 52 269 59 17 269 58 40 109 30 56	Miller Mon. 327 Mon. 326 Cliff	2, 210. 5 4, 992. 1	3. 27859 3. 34448 3. 69828 3. 80054
VIon. 329		59 55. 26 06 00. 36	55 56 07 71 05 10 90 00 55 117 59 14 298 31 09	235 53 12 251 02 58 269 59 38 297 58 13 118 33 33	Cairn Miller Mon. 328 Red Cliff	3, 743. 6	3. 75577 3. 57328 3. 31823 3. 27061 3. 64446
Mon. 330		59 55. 23 03 47. 60	90 02 18 101 25 14 330 49 29	270 00 38 281 22 33 150 50 12	Mon. 329 Red Cliff	4, 432, 4	3. 43111 3. 64663 3. 38233
Mon. 331	48 1 112 0	59 55. 19 01 21. 89	240 14 22 261 44 13 294 47 04	60 16 36 81 45 53 114 49 47	Tennant Peg Moberly	4, 149. 5 2, 718. 6	3. 61799 3. 43435 3. 68607
vIon. 332	48 8 111 8	59 54.75 59 40.11	61 32 54 90 23 16 216 30 46 237 00 17 310 52 12	241 30 31 270 21 59 36 31 43 57 00 40 130 53 39	Cliff Mon. 331 Tennant Peg Moberly	4, 386. 8 2, 068. 8 2, 578. 4 741. 3	3. 64214 3. 31572 3. 41135 2. 87002 3. 49004
Ion. 333		59 54.36 58 06.89	137 09 27 154 05 05 170 12 00	317 08 20 334 04 39 350 11 47	Coutts N. W. base Coutts S. E. base	2, 669. 5 1, 595. 9	3. 42642 3. 20301 3. 32535
Mon. 335		69 54.01 66 38.29	90 21 20 118 34 25 120 04 47 134 07 46	270 20 13 298 32 11 300 03 14 314 06 26	Mon. 333 Coutts N. W. base Coutts S. E. base Tennant	1, 801. 0 4, 116. 9	3. 255511 3. 614578 3. 460406 3. 478531

SUMMIT OF ROCKY MOUNTAINS TO LAKE OF THE WOODS, MINOR SCHEMES—Continued

Station	Latit	tude :		Aziı	mutl	h	Back a	zim	uth	To station	Distance (meters)	Logarithm
Mon. 351		, 59 4 26 3			06 06 49 18	39 34 19 30	257 341 62 120	02 06 55 23	04 26 18 56	Mountain Center III Breed Roscoe	7, 601. 4 633. 1 10, 868. 9 10, 177. 1	3. 880896 2. 801496 4. 036184 4. 007625
Mon. 354	48 111	59 4 21 2	19. 49 21. 60	- 89 95 335	51 00 47	59 34 55	269 274 155	47 56 49	59 27 21	Mon. 351 Center III Roscoe	6, 460. 5 6, 690. 3 5, 658. 5	3. 810264 3. 825446 3. 752705
Mon. 356	48 111	59 5 16 3	50. 01 39. 42	33 152 275 314	27 55 43 51	42 07 13 36	213 332 95 134	25 53 47 58	35 33 30 08	Roscoe. Br⊾ed. Center IV East Butte.	6.205.2	3. 792758 3. 742546 3. 843066 4. 174902
Mon. 362	48 111	59 8 05 1	51. 52 19. 56	16 241 276	59 21 52	52 17 26	196 61 96	57 25 54	52 02 58	East Butte Kop Center V	11,092.1	4. 045014 3. 839591 3. 615422
Mon. 366		59 5 56 4		29 52 265	45 13 17	09 51 51	209 232 85	42 05 18	11 23 23	Laird East Butte Center VI	9, 687. 5	3, 986213 4, 239648 2, 927608
Mon. 370		59 8 49 3		90 239 331	35	06 25 52	270 59 151	11 40 04	10 13 20	Center VI Spencer Center VII	7, 966. 7 8, 999. 1 1, 561. 6	3. 901279 3. 954200 3. 193583
Mon. 374		59 8 40 8		40 149 244 296 301	40 35	27 37 33 49 40	220 329 64 116 121	38 48 40	37 59 58 01 04	Strode Spencer Bar 5. Center VIII Christianson	7, 121. 4 5, 231. 2	3. 852568 3. 718602 4. 176676 3. 880843 4. 144963
Mon. 383	48 110	59 1 22 1	56. 76 52, 90	79 240 310	41	55 41 27	259 60 130	45		Center IX Center X Pugsley & Simpson	1, 432. 0 6, 496. 5	3, 155956 3, 812678 3, 674843
Mon. 384	48 110	59 8 21 0	56, 91 09, 16	89 334		55 09	269 154	51 13	37 04	Mon. 383 Pugsley & Simpson	2, 157. 8 3, 417. 5	3. 324003 3. 533707
Mon. 385		59 19		9 89 89 149	21 52 53 04	02 55 33 28	189 269 269 329	51 51	01	Pugsley & Simpson	1, 993. 6 4, 102. 2	3. 494576 3. 299631 3. 613018 3. 894879
Mon. 386		59 17		47 89	48 52	16 49	227 269	46 51		Pugsley & Simpson Mon. 385	4, 596. 5 2, 896. 4	3. 662432 3. 461855
Mon. 387		59 15		60 89 89 132 237 297	52 53 40		240 269 269 312 57 117		30 18 23 01 59 29	Pugsley & Simpson Mon. 386 Mon. 385 Center X Hat Havre	2, 096. 7 4, 993. 0 4, 658. 0 12, 918. 2	3. 800142 3. 321527 3. 698365 3. 668200 4. 111203 4. 109826
Mon. 393	48 110	59 02	58. 45 34. 21	35 212 335	53		215 32 155	31 56 21	26 06 23	Havre Day Toledo	8, 329. 2	3. 862905 3. 920602 3. 964645
Mon. 399	48 109		59. 35 42. 36	149 331		18 51	329 151		25 55	Center XI Chinook	2, 804. 5 6, 947. 5	3, 447854 3, 841832
Mon. 401			59. 62 45. 44	13 89 216	55	30	193 269 36	39 52 20	31	Chinook Mon. 399 Center XII	6, 281. 0 4, 815. 8 4, 836. 2	3, 798030 3, 682671 3, 684508
Mon. 403	48 109	59 42	59. 92 48. 15		54 17	58 39	225 269 333 156	51 16		Chinook Mon. 401 Center XII Police	4, 823, 2	3, 943730 3, 683338 3, 638609 3, 894342
Mon. 415			01. 29 52. 83	102 184 351	29	59	4	01 30 51	12	Center XIII Ryder Shep		4. 001112 3. 633856 3. 228133
Mon. 418 ecc			00. 46 39. 31	32 74 90	59	26	254	36 55 11	38	318	3. 3 6, 351. 6 6, 372. 5	0. 517440 3. 802882 3. 804313
Mon. 418			00. 46 39. 40	270	15	48	90	15	48	Mon. 418 ecc	1.9	0. 275080
Enright	49 108	02 59	23, 86 39, 05	78 110 338 352	59 31	38	290 158		18 18	318_ Strong_ S-313_ West Cherry_	12, 651, 1	4. 326338 4. 102129 3. 756060 4. 263194
Mon. 426		59 01	58. 63 52. 87	211 279 339	39	14 19 43	31 99 159	42	17	Enright. S-313. West Cherry.	5, 246, 1	3. 719833 3. 688241 4. 164394
Mon. 427	48 108		58. 38 47. 92	90 182 289	17		2	09 17 42	54	Mon. 426 Enright S-313	2, 539. 7	3. 404789 3. 653010 3. 381961

Station			and ide	Azi	mutl	h	Back a	zim	uth	To station	Distance (meters)	Logarithm
Mon. 428		59	58. 12 39. 38	90	10 11 12	22	203 270 270 270 331		35 45 00 59	S-313 Mon. 427 Mon. 426 Enright	875. 0 2, 612. 8 5, 152. 6 5, 116. 9	2. 94199 3. 41711 3. 71202 3. 70900
Mon. 442			58. 01 23. 14	55 150	43 42	48 40	235 330	40 39	39. 58	MurrayTelford	6, 159. 0 8, 908. 2	3. 78951 3. 94978
Mon. 444	48 108	59 28	58. 12 25. 64	89 134 223 291	18 54	48 17 58 46	269 314 43 111	55 13 58 29	34 20 30 44	Mon. 442 Telford Tees Avery	11, 124. 2 8, 221. 1	3. 55725 4. 04626 3. 91492 3. 71248
Mon. 446	48 108	59 25	58. 09 23, 72	90 198 329	02 44 43	01 18 01	269 18 149	59 45 43	44 32 42	Mon. 444	6, 251. 8	3. 56793 3. 79600 3. 33946
Mon. 449			58. 49 51. 55	74 89 349	57	00 10 36	254 269 169	$\frac{30}{52}$ $\frac{20}{20}$	45 14 59	Avery Mon. 446 Betts	7, 128. 7 7, 971. 4 3, 397. 5	3, 85301 3, 90153 3, 53116
Mon. 451			58. 66 11. 79	56 89		53 30	236 269	30 54	45 59	Betts_ Mon. 449	6, 065. 5 5, 686. 6	3, 78286 3, 75485
Mon. 453			58. 71 33. 69	21 70 90 117 165	38 00 12		201 250 269 297 345	16 32 57 06 02	32 22 31 31 39	White Betts. Mon. 451 Harding. Raley	10, 067. 0 4, 433. 2 11, 055. 3	3, 70001 4, 00289 3, 64671 4, 04357 3, 86326
Mon. 463	48 107		59. 14 45. 46	180 269 355	20		0 89 175	$\frac{10}{23}$	15 08 37	Cory Center XV Kerr	6, 952. 6 4, 454. 4 1, 322. 8	3. 84214 3. 64879 3. 12149
Mon. 465			59. 21 47. 87	89 97 145 325	11 21	50	269 277 325 145	56 11 18 24	55 14 51 38	Mon. 463. Center XV. Cory. Sowers.	4, 829. 4 378. 2 8, 449. 9 2, 359. 8	3. 68389 2. 57770 3. 92683 3. 37283
Mon. 473 ecc			58. 24 25. 34	108 121 220	17		288 301 40	11 09 38	23 26 19	Cory Waters Walsh	14, 913. 7	4, 3469 4, 1735 3, 7292
Mon. 476	48 107	59 28	57, 85 01, 10	90 142 259	49		270 322 79	47	$\frac{15}{23}$ $\frac{27}{27}$	Mon. 473 ecc Walsh French	5, 123. 9	3, 8189 3, 7096 3, 9546
Mon. 479	48 107		58. 96 17. 47	243 344		$\frac{05}{32}$	63 164	37 38	00 53	French Kennedy	3, 466. 1 8, 286. 5	3. 5398 3. 9183
Flag N. E. of Mon. 478		00 24		253 284		59 23	73 104			French Mon. 479		3. 6388 3. 0393
Flag S. E. of Mon. 478	48 107			213 247 256	32	56	33 67 76			Flag N. E. of Mon. 478 French Mon. 479	4, 955. 7	2. 8739 3. 6951 3. 1810
Flag east of Mon. 478	48 107	59 24		247 252 306	01	50	67 72 126		54	Flag N. E. of Mon. 478FrenchFlag S. E. of Mon. 478	5, 219. 9	2. 9395 3. 7176 2. 6791
Mon. 478	48 107		57. 63 53. 72	250 285 302	21	59	70 105 122	22	03	Flag N. E. of Mon. 478Flag east of Mon. 478Flag S. E. of Mon. 478	98.4	2, 9773 1, 9928 2, 7564
Mon. 480			00, 31 39, 22	216 268 309	12	21	36 88 129		44	French Moulstead Long		3. 2705 4. 0137 3. 8804
Rim	49 107		38. 76 46. 26	31 321	59 10		211 141	57 11	19 10	Long	7, 083. 4 1, 122. 2	3. 8502 3. 0500
Nose	49 107		48, 94 00, 83	272 278 328	05	35	92 98 148	10		Rim Moulstead Long	8, 400. 3	3. 8818 3. 9242 3. 8698
Martin			37. 71 34. 38	3 94 269	44	53	183 274 89	42	17	Long_ Nose_ Rim_	4, 209. 5	3. 7771 3. 6242 3. 5336
Chin	48 107	59 19	45. 98 28. 85	161 245 256 323	43 47	19 07	341 65 76 143	51	31 25	Nose Martin Rim Long	3, 889. 4 7, 151. 3	3. 3118 3. 5898 3. 8543 3. 7349
Mon. 481	49 107		00. 25 17. 91	26 149 250	53	43	206 329 70	53	11	Chin	1, 738. 8	2. 6933 3. 2402 3. 5464
Mon. 482			00. 20 04. 62	81 112 207 253	29 49 55 31	23 48	261 292 27 73	47 56	10 11	Chin. Nose. Martin Rim	3, 884. 9 1, 311. 7	3. 47194 3. 58938 3. 11783 3. 62363

SUMMIT OF ROCKY MOUNTAINS TO LAKE OF THE WOODS, MINOR SCHEMES—Continued

Station		itud ngit	e and ude	Azi	mut	h	Back a	zim	uth	To station	Distance (meters)	Logarithm
Mon. 483	49		00. 20 11. 03		00 22 19		269 304 55	59 21 20		Mon. 482 Martin Rim	2, 308. 8 2, 052. 5 2, 094. 6	3. 36338 3. 31228 3. 32109
Mon, 484			00. 23 10. 58	99 176 318 355	17 04 19 58	26 22 16 36	279 356 138 175	11 04 23 59	43 21 25 02	French Moulstead Grave Lewis	9, 350. 8 316. 8 10, 095. 2 9, 807. 7	3. 97084 2. 50074 4. 00411 3. 99156
Mon. 485			00. 18 29. 57	14 95 266 335		55 12 25 26	194 275 87 155	48 29 00 32	19 10 44 33	Lewis Moulstead N. 286-A Grave	10, 118, 8 3, 309, 5 2, 129, 1 8, 287, 3	4. 00512 3. 51976 3. 32819 3. 91841
Mon. 486			00. 15 40. 49	26 93 262 350	11 20 38 50	50 01 22 39	206 273 82 170	08 16 43 51	52 37 36 24	Lewis Moulstead Alkali Grave	10, 898, 7 5, 520, 6 8, 523, 5 7, 638, 9	4. 03737 3. 74198 3. 93061 3. 88303
Mon. 487			00. 11 48. 19	90 92 259	02 45 58	36 04 51	270 272 80	01 43 02	11 35 40	Mon. 486 N. 286-A Alkali	2, 282. 7 2, 376. 5 6, 266. 5	3, 35845 3, 37593 3, 79702
Mon. 488			00. 06 56. 35	90 90 91 247	$02 \\ 03 \\ 09 \\ 52$	37 28 16 39	270 269 271 67	00 59 05 54	27 53 38 19	Mon. 487 Mon. 486 N. 286-A Alkali	3, 492. 7 5, 775. 5 5, 867. 6 2, 891. 8	3. 54316 3. 76158 3. 76846 3. 46116
Mon. 489	49 107		00, 03 36, 16	171 318		12 53	351 138	07 50	06 40	AlkaliRabbit	1, 102. 5 4, 369. 8	3. 04238 3. 64046
Mon. 490			00, 00 06, 45	2 90 108	01	43 59 36	182 270 288	54 00 43	36 06 37	Rabbit Mon. 489 Alkali	3, 043. 0	3. 51755 3. 48329 3. 53056
Mon. 491	48 106	59. 57	59. 97 08. 14	38 90 240 272	16	30 59 35 10	218 270 60 92	$01 \\ 00 \\ 20 \\ 44$	54 30 23 13	Rabbit Mon. 490 Sage S. 282-A	2, 404. 8 7, 064. 1	3. 62061 3. 38107 3. 84905 3. 69197
Mon. 492	48 106	59 54	59. 95 53. 57	90 276		54 48	270 96	00 05	13 09	Mon. 491 S. 282-A		3. 43701 3. 34074
Mon. 493	48 106		59. 90 01. 66	22 90 197 256	03	38 04 10 25	202 269 17 76	30 59 51 56	35 58 52 41	S. 282-A Mon. 491 Sage Creek		2. 39717 3. 69984 3. 56567 3. 73284
Mon. 494	48 106		59. 86 19. 23	164 240 248	33	55 42 13	344 60 68	46 37 58	19 40 11	Sage Rocky Creek		3. 55992 3. 86715 3. 53290
Mon. 495	48 106	59 49		87 90 203 226 323	01 13	10	267 269 23 46 143	16 59 13 07 11	05 46 41 30 36	S. 282–A Mon, 494 Creek Rocky Hay	1, 333. 6 5, 215. 9	3. 68493 3. 42455 3. 12501 3, 71733 3. 61600
Mon. 496	48 106	59 47	59. 84 37. 12	90 132 207	39	54 29 22	269 312 27	59 38 45	45 40 33	Mon. 495 Creek Rocky		3. 26872 3. 25744 3. 61135
Mon. 497	48 106	59 45	59. 69 28. 74	31 90 168 321	05 58	02 16	211 270 348 141	05 02 57 59	39 16 50 04	Hay Mon, 495 Rocky S, 280	4, 466. 2	3. 58616 3. 64993 3. 56694 2. 43616
Mon. 498			59. 56 45. 77	142 247 301	08	55 11 33	322 67 121	19 11 06	11 52 17	Rocky Smoky Iron	4, 579. 3 6, 458. 3 3, 282. 7	3. 66080 3. 81011 3. 51623
Mon. 499	48 106		59. 46 11. 30	90 127 238	35	13	270 307 58	05 32 07	20 18 37	Mon. 498 Rocky Smoky	1, 920. 1 5, 951. 6 4, 749. 6	3. 28333 3. 77463 3. 67665
Mon. 500		59 40	59. 43 16. 99		17 18 14		220 297 34	16 13 15		Iron_ Rocky_ Smoky		3. 34569 3. 89876 3. 48244
Mon. 501	48 106		59. 43 44. 98	62 176			242 356	52 20	37 48	IronSmoky	3, 711. 2 2, 515. 4	3. 56951 3. 40061
Mon. 502	48 106		59. 42 30. 76	74 90 90 131 254 335		01 38 54	254 269 269 310 74 155	18 59 58 59 51 25	39 19 47 07 45 15	Iron. Mon. 501 Mon. 500 Smoky Burnt. Cone	4, 598. 5 3, 826. 5	3, 79690 3, 43589 3, 66261 3, 58280 2, 68158 3, 61256
Mon. 503			59. 13 24. 35	13 78	06 58 12	18 53	193 258 270	05 53	46 34 13	Cone Iron Mon, 502	3, 816. 7 8, 765. 0	3, 58169 3, 94275 3, 40983

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Station		tude igiti	and ide	Aziı	mutl	h	Back a	zim	uth	To station	Distance (meters)	Logarithm
Mon. 504	6 48 106	59	58. 87 31. 60	40 81	25 19 01 32	31 21	220	, 23 12 01 33	34 36 06 22	Cone	4, 871. 3 11, 022. 1 1, 293. 2 1, 770. 0	3. 687642 4. 042265 3. 111651 3. 247982
Mon. 505	48 106	59 31	58. 64 03. 19	53		23 39 43 29	270	50 12 12 57	37 35 36 28	Gravel Cone Mon. 504 N. 276	4, 531. 9 6, 185. 6 1, 797. 0 87. 43	3. 656279 3. 791384 3. 254540 1. 941660
Fire	48 106	58 28	52. 18 06. 74	64 120 252	29 35 25	08 27 07	244 300 72	26 33 26	09 13 19	Gravel N. 276_ Fox	5, 349. 3 4, 199. 5 2, 020. 7	3, 728295 3, 623198 3, 305499
Mon. 506	48 106	59 28	58. 56 59. 79	91 295 332	56 36 15	20 13 28	271 115 152	54 38 16	46 04 08	N. 276. Fox. Fire	2, 538. 4 3, 331. 9 2, 316. 9	3. 404558 3. 522687 3. 364908
Mon. 507	48 106	59 26	58. 45 39. 22	41 90 354	58	10	220 270 174	59 54 10	06 50 07	Fire	2, 712. 5 5, 394. 8 1, 444. 8	3, 433366 3, 731974 3, 159797
Mon. 508	48 106	59 24	38, 35 29, 67		09 04	34	240 270 84	08 03 33	01 00 36	FoxMon. 507Badger	2, 881. 5 2, 645. 6	3. 459613 3. 422518 3. 798420
Mon. 509		59 21	58. 15 42. 86	40 76 90 258	07	01 27 24 24	220 256 270 78	04 18 05 08	28 49 18 11	Kid Fox Mon. 508 Badger	6, 409. 7 6, 048. 8 3, 378. 3 2, 942. 9	3. 806837 3. 781672 3. 528699 3. 468779
Mon. 510	48 106	59 19	58. 02 23. 63	80 184 246 329	27		260 4 66 149	40 40 31 34	09 35 30 34	Fox_ Badger	8, 824. 0 612. 0 6, 796. 9 3, 934. 0	3. 945665 2. 786785 3. 832312 3. 594839
Flag south of Mon. 513			43. 75 02. 80	99 174 259		19 01 57	279 354 79	11 47 44	19 50 09	Badger Brace Coal		3. 816642 3. 500339 3. 295908
Flag north of Mon. 513	49 106	01 13	03. 44 26. 69	16 78 124 330	04	23 20 19 24	196 258 304 150	35 52 03 09	56 53 41 09	Flag south of Mon. 513 Badger Brace Coal	2, 568. 7 7, 340. 6 1, 232. 0	3. 409710 3. 865733 3. 090620 3. 385918
Mon. 511	48 106	59 17	57. 90 54. 55	238 249 275 356	34 16	16 33	58 69 95 176	28 37 19 56	48 38 28 04	Brace Flag north of Mon. 513 Flag south of Mon. 513 Branch	4, 731. 0	3. 715108 3. 764025 3. 674955 3. 530608
Mon. 512			57.80 21.06	26 90 90 99 222 270	06 07 34 51		206 270 270 279 42 91	55 04 05 32 52 00	00 50 01 33 56 22	Branch Mon. 511 Mon. 510 Badger Brace Coal	1, 900. 3 3, 711. 0 3, 712. 5 3, 708. 1	3. 579433 3. 278828 3. 569495 3. 569665 3. 569153 3. 677224
Mon. 513	48 106		57. 62 43. 82	41 95 189	13		221 275 9	59 08 43	27 55 16	Flag south of Mon. 513 BadgerFlag north of Mon. 513	6, 885, 0	2. 760915 3. 837903 3. 314416
Mon. 514		59 12	57. 71 07. 05	79 135 207 227 316	53 21 01	43 59	259 315 27 47 130	04 51 23 03 27	10 22 20 43 30	Coal Brace Slim Jeff Windy	3, 790. 2	2, 618586 3, 578657 3, 753765 3, 581570 3, 458679
Day		58 08	57. 20 59. 27	90 167 263		24	270 347 83	07 05 19	46 46 29	Windy	1, 629. 8 4, 584. 9 2, 324. 2	3. 212125 3. 661330 3. 366272
Mon. 515	48 106	59 10	57. 79 30. 72	197 290 315			17 111 135	02	44 19 03	Jeff Noon Day	2, 728. 5 4, 464. 2 2, 638. 2	3. 435920 3. 649741 3. 421307
Mon. 516			57. 92 25. 19	20 51 89 314	16 08 55	33 41 37	1	16 07 54	07 14	Day	1, 999. 4 2, 982. 6 2, 551. 6	3. 300899 3. 474593 3. 406809 3. 357365
Mon. 517			58. 04 17. 68	31 60	16 14 08	46 41 19	211 240 249 134	16 12 05	39 17	Noon Day_ Windy_ Bostick_	1, 882, 2 3, 784, 8 5, 260, 3 5, 111, 3	3. 274663 3. 578038 3. 721014 3. 708531
Mon, 518			58. 13 22. 27	64 89 127 254 340	56 27 03	31 20 23		55 25 04	13 44	Noon	4, 298. 6 2, 256. 0	3. 567429 3. 370298 3. 633327 3. 353339 3. 581074
Mon. 519	48 106	59 02	58. 22 34. 59	13 89 115	54	01 18 55	193 269 294 358	53 54 57 12	28 57 27	Bostick. Mon. 518. Kiek. N. 268.	3, 692. 7 2, 188. 7 6, 179. 7 616. 8	3. 567339 3. 340187 3. 790967 2. 790137

Station			le and tude	Azi	imu	th	Back	azin	nuth	To station	Distance (meters)	Logarithm
Mon. 520		59 00		89 104 262	56 30		269 284 82	54 29	09	Mon. 519_ N. 268_ N. 267_	2, 352. 8 2, 450. 0 3, 099. 1	3. 371593 3. 389162 3. 491236
Mon. 521	48 105	59 58		81 89 97 237		44	261 269 277 57	02 54 07 20	07 44	Noon	10, 477. 5 2, 485. 4 4, 895. 4 700. 9	4. 020256 3. 395403 3. 689785 2. 845674
Mon. 522	48 105	59 56		$\frac{0}{102}$	28 01	47 01	180 281	28 59	47 55	Black=Green N. base N. 267	440. 7 1, 803. 7	2. 644114 3. 256165
Mon. 523	48 105	59 54	58, 64 38, 81	79 254 323	52 25 06	28 09 18	259 74 143	50 26 07		Black=Green N. base Sod Nick	2, 521. 3 2, 033. 4 2, 769. 3	3, 401630 3, 308233 3, 442375
Mon. 524	48 105	59 52	58. 76 37. 16	89 136	55 33	58 07	269 316	$\frac{54}{32}$	26 48	Mon. 523 Sod	2, 472. 8 747. 1	3, 393181 2, 873386
Mon. 525	48 105	59 50	58, 86 39, 68	89 233 280	56 29 44	11 52 15	269 53 100	54 33 44	19	Mon. 524 Lost Mud	2, 387. 8 6, 949. 6 508. 9	3. 377997 3. 841957 2. 706662
Mon. 526	48 105	59 48	58. 94 50. 46	86 89 219 283	$\frac{45}{56}$ $\frac{12}{17}$	43 27 02 20	266 269 39 103	44 55 14 19	39 05 07 33	Mud	1, 722. 7 2, 220. 0 5, 328. 8 3, 670. 5	3. 236215 3. 346345 3. 726626 3. 564724
Mon. 527	48 105	59 46	59. 06 42. 95	88 89 190 310	40 56 40 52	51 18 50 41	268 269 10 130	38 54 41 53	11 42 19 17	Mud	4, 313, 1 2, 591, 9 4, 197, 8 1, 296, 0	3, 634785 3, 413619 3, 623023 3, 112604
Mon. 528	48 105	59 44	59. 17 44. 76	19 59 89	52 05 55	10 39 30	199 239 269	51 04 54	04 46 01	Child Harris Mon. 527	5, 257. 4 1, 658. 3 2, 402. 4	3. 720772 3. 219654 3. 380638
Mon. 529	48 105	59 42	59. 28 45. 02	40 77 89	29 31 56	19 06 14	220 257 269	26 28 54	43 43 43	Child Harris Mon. 528	6, 503. 8 3, 950. 4 2, 433. 8	3. 813165 3. 596639 3. 386292
Mon. 530			59. 18 55. 87	52 82 90 90 222 296	$31 \\ 02 \\ 01 \\ 05 \\ 45 \\ 35$	48	232 261 269 270 42 116	27 59 58 03 46 36	02 03 21 50 28 11	Child Harris Mon. 528 Mon. 529 Middle Fork	8, 120, 1 6, 135, 0 4, 652, 5 2, 218, 7 2, 076, 8 1, 993, 8	3. 909559 3. 787817 3. 667687 3. 346093 3. 317390 3. 299678
Mon. 531	48 105	59 38	59. 06 50. 02	143 240 284	$\frac{06}{31}$ $\frac{27}{27}$	27 16 01	323 60 104	$05 \\ 34 \\ 28$	44 02 57	Middle Poplar Scobey	1, 911. 4 5, 132. 3 3, 238. 1	3. 281347 3. 710308 3. 510285
Mon. 532		59 36	58. 91 31. 25	76 90 111 213 338	$\begin{array}{c} 12 \\ 06 \\ 08 \\ 06 \\ 38 \end{array}$	18	256 270 291 33 - 158	$10 \\ 04 \\ 06 \\ 07 \\ 38$	08 33 13 10 43	Fork. Mon. 531. Middle Poplar. Scobey.	3, 703. 4 2, 820. 6 4, 253. 7 3, 018. 4 863. 8	3. 568605 3. 450349 3. 628766 3. 479776 2. 936393
Mon. 533			58, 80 03, 90	10 61 90 177 209	07 08	20 32 13 40 43	190 241 270 357 29	27 15 06 08 33	14 38 07 35 34	Break Scobey	874. 7 1, 666. 3 1, 775. 6 2, 534. 8 2, 782. 2	2. 941872 3. 221749 3. 249335 3. 403950 3. 444396
Mon. 534	48 105	59 33	58. 72 36. 92	66 90 170 241 275	05 44 57	16	245 270 350 61 95	44		Break	2, 109. 0 1, 767. 8 2, 454. 9 3, 302. 4 3, 189. 9	3. 324069 3. 247443 3. 390029 3. 518836 3. 503771
Mon. 535	48 105	59 31	58. 58 04. 21	124 173 324	$05 \\ 46 \\ 05 \\ 32$	01 49 11 55 21 22	260 270 304 353 144 165	20 03 44 05 33 20	54 54 01 48 36 25	Break Mon. 534 Knoll Din Nice Coy	5, 102. 9 3, 104. 1 4, 258. 2 1, 567. 2 3, 476. 4 288. 6	3. 707817 3. 491939 3. 629222 3. 195115 3. 541127 2. 460232
Mon. 536	48 105		58. 47 14. 69	245	15	40 51 29 23	270 65	41 04 18 04	20 28 26 00	Coy	2, 170. 7 2, 226. 0 5, 255. 4 6, 160. 2	3. 336590 3. 347531 3. 720606 3. 789593
Mon. 537			58. 38 44. 66	90 110 233	05 13 12	49 29 32 53 42	270 290 53	04 10 14	34 21 55 42 10	Nice Mon. 536 Din. Fee Har	3, 485. 9 1, 830. 1 4, 522. 2 3, 675. 4 4, 468. 7	3. 542310 3. 262474 3. 655345 3. 565307 3. 650183
Vion, 538			58, 29 59, 47	90 103 200	06 48 06	05 51 34 12 24	270 283 20	03 44 06	37 42	Nice Mon. 535 Din Fee Har	5, 043. 6 6, 194. 2 6, 570. 7 2, 346. 1 2, 730. 1	3. 702738 3. 791986 3. 817611 3. 370340 3. 436185

Station	Latitud		Azimuth	Back azimuth	To station	Distance (meters)	Logarithm
Mon. 539	6 / 48 59 105 24	58.18	0 / // 12 09 28 90 05 53 146 11 41 263 14 01	0 / // 192 09 12 270 04 28 326 10 46 83 15 26	Har. Mon. 538. Fee Ray=Ogden N. W. base	2, 046. 1 2, 284. 8 2, 655. 7 2, 320. 8	3. 310936 3. 358857 3. 424180 3. 365634
Mon. 540	48 59 105 22	58. 05 01. 54	56 13 19 90 06 46 138 18 09 183 40 03 332 45 19	236 11 28 270 03 46 318 17 59 3 40 08 152 45 41	Har Mon. 538 Ray = Ogden N. W. base Fil Ogden S. E. base	3, 589. 2 4, 836. 3 370. 9 2, 124. 9 1, 325. 3	3. 554994 3. 684514 2. 569252 3. 327341 3. 122303
Mon. 541	48 59 105 19	57. 91 54. 84	59 12 08 90 06 24 131 04 31 248 24 35 284 55 58	239 10 55 270 04 48 311 03 01 68 27 59 105 00 19	Ogden S. E. base Mon. 540 Fil Neil Merril	2, 292. 4 2, 575. 3 3, 234. 6 5, 906. 9 7, 289. 6	3. 360290 3. 410825 3. 509818 3. 771360 3. 862706
Mon. 542	48 59 105 17	57. 80 50. 11	75 27 28 90 05 42 113 11 34 292 36 50	255 24 41 270 04 08 293 08 29 112 39 37	Ogden S. E. base Mon. 541 Fil Merril	2, 535. 4	3. 667840 3. 404044 3. 733198 3. 688652
Uffurd		14. 10 26. 24	181 11 39 256 25 33 326 25 09	1 11 40 76 29 42 146 26 08	Neil Spring Merril	1, 671. 3 6, 904. 0 2, 859. 9	3. 223046 3. 839100 3. 456348
Colin		39, 12 00, 53	154 11 18 169 57 02 246 25 42 320 52 56	334 10 58 349 56 44 66 29 32 140 53 35	Uffurd Neil Spring Merril	1, 200. 1 2, 794. 2 6, 752. 1 1, 678. 6	3. 079228 3. 446252 3. 829441 3. 224949
Mon. 543		57. 66 51. 74	225 36 03 298 48 35	45 36 22 118 49 13	Uffurd Colin		2. 860696 3. 074911
Met		01. 07 33, 17	69 06 47 99 56 41 132 30 31 245 24 11	249 05 41 279 55 16 312 29 07 65 26 55	Colin	3, 069. 1	3. 278912 3. 367924 3. 487013 3. 686127
Mon. 544		57. 53 49. 97	68 22 44 90 06 21 104 39 52 138 38 54 245 52 12 252 15 18	248 21 51 270 04 49 284 38 39 318 37 43 65 55 09 72 15 31	Colin Mon. 543 Uffurd Neil Spring Met	2, 922. 5	3. 188340 3. 393626 3. 305890 3. 463586 3. 716868 2. 554422
Mon. 545	48 59 105 13	57. 51 25. 48	90 04 28 125 05 53	270 04 09 305 05 47	Mon. 544	497. 7 191. 1	2. 696994 2. 281197
Bully		04.18	48 56 56 116 44 03 235 00 54 302 28 40	228 55 27 296 41 37 55 02 36 122 30 13	Merril Neil Spring Hearst	4, 398. 2 3, 354. 4	3. 499850 3. 643275 3. 525609 3. 471084
Mon. 546	48 59 105 11	57.38 01.10	98 23 27 211 49 42	278 22 34 31 50 32	Bully	1, 440. 3 2, 510. 2	3. 158460 3. 399709
Mon. 547	48 59 105 08	57. 27 8 48. 54	49 44 48 90 05 22 92 59 20 147 20 11 253 28 42	229 43 48 270 03 42 272 56 47 327 11 20 73 30 00	Hearst Mon. 546 Bully Spring	2, 694. 4 4, 124. 8 2, 537. 6	3. 328097 3. 430467 3. 615407 3. 404428 3. 344244
Mon. 548		57. 23 7 08. 28	69 26 54 90 02 38 187 16 45 236 26 54	249 24 38 270 01 22 7 16 48 56 30 26	Hearst Mon. 547 Pull Mervin	634. 2	3. 592392 3. 309186 2. 802195 3. 835619
Mon. 549		57. 16 4 45. 49	34 12 16 90 03 21 102 37 16 216 33 47	214 11 30 270 01 33 282 35 32 36 35 31	Pebble Mon. 548 Pull Mervin	2, 902. 4 2, 891. 6	3. 336350 3. 462761 3. 461141 3. 673259
Mon. 551		9 57.07 1 08.08	38 34 50 95 02 29 156 59 09		Beaver Pull Mervin	2,756.2 7,268.5 4,115.1	3. 440317 3. 861446 3. 614379
Mon, 550		9 57.11 3 02.83	190 47 48 270 01 04		Mervin Mon. 551	3, 854. 4 2, 332. 4	3. 585955 3. 367810
Mon. 552		9 57.04 9 41.70	58 13 22 90 02 25 138 24 28 232 41 46 292 42 24	270 01 20 318 22 23 52 44 50	Beaver Mon. 551 Mervin Pasture Robinson	5, 066, 7	3. 611519 3. 244465 3. 704724 3. 792550 3. 686520
Mon. 553		9 56. 94 7 27. 22	90 04 34 121 54 18 210 21 07 316 59 59	301 50 32 30 22 29	Mon. 552 Mervin Pasture Robinson	7, 179. 8	3. 436730 3. 856111 3. 639213 3. 408664
Mon. 554	48 50 104 5	9 56.83 4 52.51	36 46 35 90 05 39 112 22 25 231 37 45	270 02 01 292 16 42	Robinson Mon. 552 Mervin Giles	5, 878. 3 9, 989. 7	3. 368357 3. 769254 3. 999551 3. 831474

Station	Lat	itud ngit	e and ude	Azi	mut	h	Back a	azin	uth	To station	Distance (meters)	Logarithm
Mon. 555	6 48 104		56. 73 28. 81	66 90 134 209		15 25 25 25 25	246 270 314 29	35 02 16 41	36	Robinson Mon. 554 Pasture Giles	4, 705. 9 2, 920. 9 5, 393. 7 4, 847. 7	3. 672641 3. 465518 3. 731887 3. 685535
Davis	48 104	58 49	45. 34 00. 56	92 126 164 225	18 27 05 29	16 38 07 37	272 306 344 45	12 22 03 30	59 37 59 53	Robinson Pasture	8, 561. 3 10, 058. 6 6, 673. 0 2, 864. 0	3. 932538 4. 002537 3. 824318 3. 456980
Mon. 556	48 104		56. 66 16. 00	75 90 119 325	09 03 54 09	12 47 38 00	255 270 299 145	04 02 50 09	51 07 35 57	Robinson Mon. 555 Pasture Davis	7, 263. 0 2, 699. 6 7, 565. 2 2, 684. 4	3. 861116 3. 431293 3. 878818 3. 428840
Mon. 557	48 104	59 48	56. 60 16. 60	78 90 112 147 279	53 03 48 08 34	21 26 31 48 36	258 270 292 327 99	47 01 42 07 35	31 56 57 07 19	Robinson Mon. 556. Pasture Giles Zemper	2, 427. 0 9, 744. 9	3. 983574 3. 385071 3. 988776 3. 700623 3. 066346
Mon. 558		59 45	56. 50 48. 45	84 90 117 168 305	$09 \\ 04 \\ 13 \\ 26 \\ 06$	27 24 39 12 38	264 270 297 348 125	$08 \\ 02 \\ 12 \\ 25 \\ 06$	18 32 43 38 48	Zemper	1, 872. 3 3, 011. 3 1, 705. 7 4, 529. 7 323. 9	3. 272381 3. 478756 3. 231896 3. 656069 2. 510435
Mon. 559		59 44	56. 46 53. 09	77 90 155 220 264	51 03 24 50 30	30 52 02 20 17	257 270 335 40 84	50 03 22 51 31	58 10 46 47 12	Johnson Mon. 558. Carlisle Lump Out	880. 0 1, 125. 3 4, 882. 3 3, 566. 0 1, 492. 1	2. 944497 3. 051263 3. 688626 3. 552181 3. 173798
Mon. 560	48 104	59 43	56. 41 18. 55	90 108 188 228 269	03 18 39 36 13	29 17 54 14 26	270 288 8 48 89	$02 \\ 18 \\ 40 \\ 38 \\ 15$	17 01 09 59 56	Mon. 559 Out. Lump. Rose Guard.	1, 921. 6 459. 5 2, 730. 2 5, 918. 7 4, 037. 8	3. 283652 2. 662296 3. 436187 3. 772226 3. 606150
Bob	49 104		25. 38 36. 48	218 293	06 12	$\frac{25}{22}$	38 113	07 13	53 35	Rose	3, 834, 9 2, 135, 5	3. 583749 3. 329493
Mon. 561		59 41	56. 33 04. 24	90 143 203 225 267		41 35 03 01 47	270 323 23 45 87	01 51 38 45 34	59 10 07 37 35	Mon. 560. Bob Rose. Rood. Guard	2, 730. 2 1, 111. 1 4, 272. 4 5, 891. 6 1, 308. 5	3. 436197 3. 045768 3. 630672 3. 770234 3. 116764
Mon. 562		59 39	56, 52 08, 31	89 92 106 170 253 264	52 42 30 39 27 23	14 56 18 23 06 20	269 272 286 350 73 84	50 42 28 38 27 25	46 17 26 59 58 57	Mon. 561 Guard Bob Rose In Fly	1, 050. 3	3. 372251 3. 021304 3. 497033 3. 597810 3. 166640 3. 627402
Mon. 563			56. 67 44. 97	89 145 242 260 280	51 13 46 48 11	20 40 19 08 10	269 325 62 80 100	50 13 49 49 13	17 30 32 42 48	Mon. 562. In	1, 694. 0 503. 2 5, 825. 3 2, 559. 1 4, 312. 3	3. 228921 2. 701740 3. 765320 3. 408080 3. 634704
Mon. 564			56. 86 49. 79	89 98 204 226 292	52 49 41 53 01	04 33 30 47 38	269 278 24 46 112	50 47 41 55 02	37 56 37 33 48	Mon, 563 In Fly Wild. Berry.	2, 341. 2 2, 659. 5 443. 1 3, 889. 4 2, 052. 5	3. 369446 3. 424806 2. 646496 3. 589881 3. 312293
Mon. 565	48 104		57. 05 59. 04	24 89 94 100 295	12 51 43 52 05	06 45 49 50 47	204 269 274 280 115	11 50 40 51 08	53 22 48 33 33	Berry Mon. 564 In Fly View	850. 7 = 2, 251. 2 4, 895. 7 2, 103. 7 4, 946. 2	2. 929800 3. 352411 3. 689817 3. 322991 3. 694273
Mon. 566	48 104	59 32	57. 18 36. 96	235 306	37 48	51 33	55 126	40 50	31 17	Man View	5, 234. 8 3, 510. 0	3. 718901 3. 545313
Mon. 567	48 104	59 30	57. 44 05. 30	89 202	52 49	09 32	269 22	50 50	15 18	Mon. 566 Man	3, 082. 7 3, 196. 0	3, 488935 3, 504610
Mon. 568.	48 104		57. 56 44. 21	42 83 89 172 253 304	16 20 52 06 23 08	05 34 23 41 25 12	222 263 269 352 73 124	$14 \\ 16 \\ 51 \\ 06 \\ 25 \\ 10$	54 23 22 26 50 46	View Berry Mon, 567 Man White Chap	2, 858. 4 6, 794. 9 1, 648. 3 2, 969. 8 4, 076. 9 5, 033. 6	3, 456118 3, 832181 3, 217037 3, 472732 3, 610335 3, 701880
Mon, 569 ecc	48 104	59 27	59. 94 16. 85	59 87 142 242 320	23 38 44 53 30		239 267 322 62 140	21 37 42 55 31	31 13 54 06 38	View_ Mon. 568_ Man White_ Chap_	4, 297. 5 1, 777. 2 3, 604. 4 2, 394. 5 3, 757. 2	3. 633215 3. 249736 3. 556833 3. 379209 3. 574865
Mon. 569	48 104	59 27	57. 72 14. 13	$\frac{141}{320}$	12 29	51 10	321 140		49 37	Mon. 569 ecc Chap	88, 20 3, 669, 0	1. 945469 3. 564549

Station		itude ngite	e and ide	Azi	mut	h	Back a	zim	uth	To station	Distance (meters)	Logarithm
Mon. 570	6 48 104		57. 88 33. 34	89 181	54 52 23 28 16		249 269 1 84 174	51 50 23 32 16	77 12 53 15 16 14	View Mon. 569. White Thompson Chap	6, 179. 6 2, 048. 7 1, 154. 5 6, 444. 0 2, 850. 3	3. 790959 3. 311487 3. 062410 3. 809158 3. 454895
Mon. 571			58. 08 39. 25	35 89 116 261 303	29	38 28 44 44 58	215 269 296 81 123	35 50 36 32 46	22 02 19 16 06	Chap Mon. 570. White Thompson Blondie	3, 495. 7 2, 318. 9 2, 562. 3 4, 140. 9 6, 092. 8	3. 543531 3. 365289 3. 408625 3. 617098 3. 784815
Mon. 572			58. 26 55. 64	55 89 253	30 51 04		235 269 73	27 50 05	53 21 17	Chap Mon. 571 Thompson	5, 026. 1 2, 106. 0 2, 079. 8	3. 701235 3. 323468 3. 318012
Mon. 573			58. 47 53. 16				269 279 320 104 172	50 19 09 08 08	14 55 00 03 03	Mon. 572	2, 489, 6 6, 979, 0 780, 0 6, 021, 2 3, 428, 6	3. 396135 3. 843791 2. 892096 3. 779680 3. 535115
Mon. 574		59 17	58. 71 31. 00	35 89 99 242 296	26 52 54 23 32		215 269 279 62 116	24 50 52 24 34	46 13 48 36 45	Blondie Mon. 573 Thompson High. Round	4, 177. 1 2, 889. 7 3, 440. 5 2, 511. 5 3, 297. 7	3. 620873 3. 460851 3. 536622 3. 399933 3. 518214
Mon. 575	48 104	59 16	58. 84 15. 52	89 96	16 51 49 14	46 48		14 50 46 15	14 49 45 46	Blondie Mon. 574 Thompson Round	5, 221. 2 1, 534. 2 4, 958. 3 2, 046. 7	3. 717773 3. 185882 3. 695337 3. 311061
Mon. 576			58. 99 45. 30	15 89 135 298	46 51 19 13	37	269 315	45 50 19 15	44 29 11 04	Round Mon. 575_ High_ Cut_	1, 624. 2	3. 187908 3. 263334 3. 210628 3. 330515
Dahl	49 104	00 12	36. 82 54. 81	9 45 89 289 329	23 09 47 17 13	07 11 22 49 43	189 225 269 109 149	22 07 45 19 15	53 32 16 51 52	Cut Round High Mon. 579 Knute	3, 759. 4 3, 387. 3 3, 488. 8	3. 344568 3. 575122 3. 529858 3. 542670 3. 832960
Ulan	48 104		35. 88 27. 49	71 163 255	56 34 04	07 15 57	251 343 75	55 33 06	33 54 38	Cut Dahl Mon, 579	963. 3 1, 962. 7 2, 833. 0	2. 983779 3. 292848 3. 452248
Mon. 577	48 104	59 13	59. 14 21. 52	54 89 112 205 269 303 349	51 01	18 06 49 15 57 52 00	234 269 292 25 89 123 169	56 50 00 00 52 12 50	59 03 04 35 19 33 07	Round Mon. 576 High Dahl Mon. 579 Ulan Cut	1, 703. 1 3, 068. 6 1, 284. 2 3, 835. 7 1, 312. 5	3, 413606 3, 231240 3, 486936 3, 108618 3, 583840 3, 118093 3, 014420
Mon. 578			59. 31 40. 42	52 89 127 269	53 51 28 50	29 53 20 27	232 269 307 89	52 50 27 51	54 37 24 33	Ulan Mon. 577 Dahl Mon. 579	2, 054. 9	3. 079115 3. 312781 3. 279817 3. 250619
Mon. 580	48 104	59 08	59. 69 12. 63	25 89 258	38 50 51	51 57 10	205 269 78	37 49 54	27 27 14	Knute_ Mon. 579_ Deal_	5, 216, 4 2, 442, 8 5, 054, 3	3. 717370 3. 387893 3. 703660
Mon. 581	48 104	59 06	59. 86 39. 82	41 89 336	22 50 45	30 53 51	221 269 156	19 49 46	56 43 47	Knute Mon. 580 Finley	6, 272. 2 1, 886. 4 3, 850. 3	3. 797421 3. 275639 3. 585491
Mon. 582	48 104	59 04	59. 65 14. 07	22 56 90 186	15 33 08	43 13 31 04	202 236 270 6	14 28 06 28	49 50 41 08	Finley Knute Mon. 581 Deal	3, 815. 9 8, 522. 3 2, 962. 7 982. 4	3. 581592 3. 930558 3. 471690 2. 992304
Mon. 583 ecc	48 104		59, 52 48, 15	42 120 265 307			222 300 85 127	07 55 04 48	33 31 49 25	Finley Deal Poster Fine	4, 757. 5 1, 906. 8 6, 995. 1 7, 322. 2	3. 677378 3. 280315 3. 844796 3. 864642
Mon. 583, Montana-North Dakota Boundary.	48 104	59 02	59. 53 53. 49	122 270	41 07	59 21	302 90	41 07	02 25	Deal Mon. 583 ecc	1, 814. 4 108. 7	3. 258723 2. 036182
Mon. 584			59. 36 01. 01	56 90 104 262 321	08 30 43	44	236 270 284 82 141	42 07 28 46 10	40 23 08 37 00	Finley Mon. 583 ecc Deal Foster Fine	6, 422. 6 2, 177. 6 3, 938. 3 4, 830. 1 5, 753. 2	3, 807708 3, 337977 3, 595305 3, 683959 3, 759909
Mon. 585 ecc	48 103		57. 07 57. 45	93 258 332	59	50 14 34	273 79 152	07 01 18	02 24 00	Mon. 584 Foster Fine	1, 294. 0 3, 565. 0 4, 981. 3	3. 111947 3. 552055 3. 697339
Mon. 585	48 103	59 59	59. 26 59. 08	90 333	08 47	38 06	270 153			Mon. 584 Mon. 585 ecc	1, 258. 9 75. 25	3. 099981 1. 876483

Station		itud ngiti	e and ude	Azi	mut	h	Back a	zim	uth	To station	Distance (meters)	Logarithm
Mon. 586	48 103		59. 11 22. 50		08 04 32 04	13 03	268 277 68 175	07 59 33 04	24	Mon. 585 ecc Deal Foster Fine	1, 930. 9 7, 104. 4 1, 686. 7 4, 489. 4	3. 285760 3. 851527 3. 227026 3. 652188
Mon. 587 ecc	48 103		56. 53 57. 45	30 91 116 268	33	48 36 52 20	210 271 296 88		13 47 01 58	Fine. Mon. 586. Foster. Flew.	5, 086, 6 2, 949, 4 1, 544, 4 5, 869, 8	3. 706431 3. 469740 3. 188768 3. 768620
Mon. 587	48 103	59 55	58. 90 57. 43	0	20	08	180	20	08	Mon. 587 ecc	73, 10	1. 863923
Mon. 588 ecc	48 103	59 53	58. 41 53. 62	88 99 268 300	33	44	268 279 88 121	39 17 35 03	59 20 28 24	Mon. 587 ecc Foster Flew_ Skermo	3, 352, 1	3, 400994 3, 596293 3, 525321 3, 949747
Mon. 588	48 103	59 53	58. 70 34. 28	88	41	47	268	41	32	Mon. 588 ecc	393. 35	2, 594779
Mon. 589	48 103		58, 49 02, 31	89 121 267		25	269 301 87	56 41 43	20	Mon. 588 ecc Flew	3, 482. 2 154. 05 5, 851. 8	3, 541854 2, 187670 3, 767291
Cairn south of Skermo			25, 12 26, 58	140	32 31 42 47	44	281 320 342 47		59 23 24 55	Fine Mon. 588 ecc Flew Skermo	8, 538. 7 6, 988. 3	4. 030726 3. 931394 3. 844374 3. 473631
Harding	48 103		53, 30 15, 50	66 180 215 274	50	36 35		$\frac{14}{52}$	55 37 16 38	Skermo Fled Bowie Brown	4, 671. 8	3. 262995 3. 613094 3. 669481 3. 755174
Mon. 590			58. 31 47. 11	6 90 91 321 343	44 23	15	186 270 271 141 163			Cairn south of Skermo Mon. 589. Flew Harding Skermo	2, 748. 1 2, 880. 5 4, 941. 3	3. 821800 3. 439035 3. 459464 3. 693841 3. 680869
Mon. 591			58. 11 20. 01	90 90 203 271	56 48		270 270 23 91	52	35 16	Mon. 589 Flew Fled Bowie	5, 869. 8 270. 4	3. 758765 3. 768626 2. 432087 3. 451508
Mon. 592	48 103		57. 91 04. 12	34 43 90 95 314	36 08 28	22 21	214 223 270 275 134	33 06 26	40 38 38	Harding Skermo Mon. 591 Fled Bowie	6, 315. 1 2, 762. 2 2, 665. 0	3. 670760 3. 800380 3. 441253 3. 425705 1. 957430
Mon. 593			57. 80 42. 91	241	51 07	48 52	228 267 270 61 162		27 47 27	Harding Bowie- Mon. 592 Olsen. Brown	1, 586. 7 1, 650. 8 1, 089. 0	3. 762373 3. 200507 3. 217686 3. 037034 3. 653418
Mon. 594	48 103	59 41	57. 65 01. 96	90		32 44 41	189 270 295 89 128	07	16 03 42	Brown Mon. 593 Olsen Gopher Ruin	2, 052, 0 1, 221, 4 3, 255, 3	3. 638319 3. 312187 3. 086862 3. 512590 3. 592630
Mon. 595	48 103	59 39	57. 49 18. 52	90 99 269	14 08 32 39 04	19 19 08	279	07 30	01 20 51	Brown Mon. 594 Olsen Gopher Ruin	2, 102. 5	3. 709612 3. 322744 3. 511409 3. 061744 3. 415754
Mon. 596	48 103		57. 36 39. 40	23 90 90 293	07 44	56 46	203 270 270 113	06 44	14	Ruin Mon. 595. Gopher Ledge	2, 627. 7 2, 014. 6 861. 9	3. 419571 3. 304187 2. 935459 3. 705944
Mon. 597 ecc	48 103		57. 20 53. 36	53 90 90 248 308	08 19 06	27 12 07	233 270 270 68 128	$\frac{07}{17}$	20 39	Ruin. Mon. 596 Gopher. Hagen. Ledge	3, 017. 3 2, 662. 4	3. 602389 3. 333541 3. 479622 3. 425277 3. 506422
Mon. 597	48 103		57. 20 55. 73	90 90 270		21	270 270 90	07 17 08	30	Mon. 596 Gopher Mon. 597 ecc	2, 107. 3 2, 969. 2 48. 17	3. 323725 3. 472634 1. 682804
Mon, 598	48 103		57. 26 00. 43	90	01 09	52 42 36	270 270 10 79 173		35 48 12	Mon. 596. Gopher. Hagen Custom Ledge	4, 287. 4	3. 648461 3. 725329 3. 002602 3. 632189 3. 302380
Mon. 599	48 103	59 32	57. 29 25. 74	40 89 119 250 307	58 30 37	31 05	220 269 299 70 127		19 00 56	Ledge Mon. 598 Hagen Custom Ambrose	2,009.9	3. 419050 3. 284380 3. 303164 3. 384463 3. 557491

Station		tude	and ide	Aziı	nutl	1	Back a	zim	uth	To station	Distance (meters)	Logarithm
Mon. 600		59	57. 33 55. 53		00		240 29 116	27		Ledge Custom School=Ambrose N. E. base Ambrose	921. 5	3. 608868 2. 964482 3. 375990 3. 387663
Mon. 601			57. 36 30. 93	17 89 122 239 338	58	05 23 52 23 50	269	39 57 19 06 16	39 19 05 09 05	Ambrose Mon. 600 Custom Friess School=Ambrose N. E. base		3. 367918 3. 235418 3. 17568 3. 523168 3. 050660
Mon. 602			57. 42 09. 79	27 66 89 179 245	58	34	207 246 269 359 65		44 03 01 40 02	Nat School=Ambrose N. E. base Mon. 601 Friess Wheat	2, 868. 8 1, 711. 8	3. 257790 3. 425940 3. 457700 3. 233450 3. 459840
Mon. 603			57. 48 54. 56	89	54 58 50 01 32	46		52 57 48 01 32	43 04 52 48 42	Nat Mon. 602 Friess Wheat Gubert	2, 748. 8 3, 242. 7 1, 199. 5	3. 59458 3. 43915 3. 51090 3. 07898 3. 11124
Mon, 604	48 103	59 22	57. 52 49. 48	89	20 58 05 11 36	56 19	240 269 294 64 141	57 03 13	22 40 41	Gubert Mon. 603 Wheat Lister Bone	2, 542. 5 2, 921. 0 3, 498. 4	3. 39887 3. 40526 3. 46553 3. 54386 2. 83875
Mon, 605	48 103	59 21	57, 56 00, 28	89 211	10 58 27 43	31 43 46 26	253 269 31 151	09 57 28 44	24 21 21 12	Bone	2, 219. 6 1, 782. 9	3. 27218 3. 34627 3. 25112 3. 41968
Mon. 606			57. 60 50. 80		28	16	210 262 269 59 117	55 58 57 30 40	32 32 25	Huso Bone Mon. 605 Hold Bloom	4, 456. 5 2, 631. 9 3, 070. 0	3. 43135 3. 64899 3. 42026 3. 48713 3. 50387
Mon. 607			57. 64 00. 36	89 111 194 338	25	39 59 25 06	269 291 14 158	57 01 25 36	40	Mon. 606. Lister Hold Bloom	4, 227. 3 1, 607. 8	3. 35117 3. 62606 3. 20623 3. 20203
Mon. 608			57 68 34.79	38 89 139 261 325	18 20	45 13 15	217 269 319 81 145	57 17 22	40 23 28	Bloom Mon 607 Hold Goed Church	3, 610. 7	3. 27472 3. 24042 3. 31234 3. 55830 3. 32920
Mon. 609			57. 73 44. 53	30 66 89 247	25 58	23 22 07 38	210 246 269 67	23	16 44	Church Bloom Mon. 608 Good	3, 710. 5	3. 31284 3. 56943 3. 35047 3. 15847
Mon. 610			57. 77 09. 83	59 89 132 352	58 29	15 28	239 269 312 172	57 29	03 06	Church Mon. 609 Good Mouse	1, 924. 8	3, 53887 3, 28438 2, 90326 3, 29786
Mon. 611			57, 66 50, 28	52 90 99 255 296	05 02 55	00 16 26	232 270 279 75 116		09	Mouse. Mon. 610 Good Hansen Bacon.	3, 469. 7	3, 51013 3, 45281 3, 54028 3, 58304 3, 50479
Mon. 612	48 103	59 07	57. 57 49. 18	68 90 95 233 344	20 19	48 12 26	248 270 275 53 164	03 16 20	34 13	Mouse Mon. 611 Good Hansen Bacon	5, 913, 3	3. 73264 3. 39117 3. 77183 3. 19368 3. 16941
Mon. 613			57, 56 38, 50	57 90 123 246 308	01 37 20	11 39 29	237 269 303 66 128	59 36 22	32 47 03	Bacon Mon. 612 Hansen Burner Feeney	2, 656. 4 1, 685. 3 2, 762. 0	3. 42592 3. 42430 3. 22666 3. 44122 3. 44663
Mon. 614	48 103	59 03	57. 55 07. 62	26 75 90 101 154 263	04 01 49 10	50 21 08 24	206 255 269 281 334 83	01 59 46 10	33 27 22 04	Feeney Bacon Mon. 613 Hansen Burner Just	5, 509, 6 3, 066, 8 4, 566, 3 1, 231, 1	3. 28761 3. 74111 3. 48668 3. 65956 3. 09030 3. 48861
Mon. 615			57, 50 56, 93	63 90 109 227 325	02 10 50	40 50 29	243 270 289 47 145	01 08 50	01 52 44	Feeney Mon. 614 Burner Just Plow	2, 656. 5 3, 380. 0 543. 0	3. 59443 3. 42431 3. 52891 2. 73478 3. 47034
Peterson			06. 50 48. 70	51 91 276 334	05 42	30 59	231 271 96 154	02	38	Plow Just_ Ross Corn_	4, 643. 7 1, 482. 4	3. 63690 3. 66686 3. 17097 3. 59307

Station		tude igitu	and ide	Azir	nutl	n	Back a	zim	uth	To station	Distance (meters)	Logarithm
Mon. 616	48		57. 46 50. 52	20		01	200 270 279 83 88			Plow- Mon. 615- Just Peterson- Ross- Corn-	2, 597. 5 2, 569. 5 2, 197. 5 2, 491. 8 3, 949. 8 5, 301. 3	3. 414562 3. 409851 3. 341938 3. 396508 3. 596575 3. 724383
Mon. 617			57. 40 47. 17	90 94	29 03 31 42 43			01	28 48 18 03 46	Plow Mon. 616 Just Peterson Ross	4, 189. 2 2, 507. 2 4, 688. 4 2, 826. 6 1, 445. 2	3. 622128 3. 399184 3. 671027 2. 451269 3. 159940
Mon. 618			57. 34 34. 31	17 90 94 262 317	24 03 57 53 13		197 270 274 82 137	23 01 56 56 15	31	Corn	3, 394. 5 2, 700. 5 1, 264. 0 4, 118. 2 4, 880. 6	3. 530778 3. 431444 3. 101730 3. 614710 3. 688475
Mon. 619			57. 32 58. 45	42 90 91 256 339		38	222 270 271 76 159	00 56 38	22 36 39 30 01	Corn Mon. 618 Ross Estevan Crosby 2	1, 948. 6 3, 209. 7 2, 197. 9	3. 642506 3. 289726 3. 506465 3. 342003 3. 583640
Short			24. 92 02. 00	76	38 37 23	48	206 256 137	36 36 24	54	Crosby 2 Estevan Center I	4, 961. 7 1, 488. 3 2, 927. 0	3. 695634 3. 172694 3. 466419
Mon. 620	48 102	59 51	57. 30 00. 64	153	01 16 23 16	15 21		16 24	05 05	Mon. 619_ Estevan_ Short_ Center I_	2, 394. 7 569. 9 1, 465. 7 3, 429. 7	3. 379259 2. 755773 3. 166041 3. 535259
Mon. 621	48 102	59 49	57. 24 40. 56			30 36	270 285 332 130	02 09 59 03	20 19	Mon. 620 Estevan Short Center I	1,951.8	3. 211545 3. 290437 2. 982090 3. 305197
Mon. 622	48 102	59 47	57. 10 55. 29			00	204 270 288 68	39 06 26 36	41 30	Center I Mon. 621 Short Percee	2, 139, 9 2, 715, 2	3. 153806 3. 330396 3. 433796 3. 692234
Mon. 623			57. 00 45. 92	90	07 08 24	44 26 26	237 270 270 60 130	06 26	52 14 24	Center I Mon. 622 Mon. 621 Percee Columbus	1, 409. 9 3, 549. 9	3. 377485 3. 149201 3. 550210 3. 562140 3. 642165
Mon. 633	48 102	59 27	55. 62 21. 98		41 21 43	51 58 29	261 321 103	21	26	Center IV North Portal Center V	2, 366, 4 1, 389, 9 1, 516, 7	3. 374080 3. 142999 3. 180894
Mon. 634	48 102	59 24	55. 63 51. 13	77 90 244 349		25 42	257 269 64 169	14 58 17 24	31 54	Center V Mon. 633 Bien Klitzke	2, 160. 0	3. 213044 3. 486595 3. 334462 3. 522806
Mon. 635	48 102	59 22	55. 65 37. 51	90	43 00 35	19	212 269 320	41 58 35	38	Klitzke Mon. 634 Bien	3, 893. 8 2, 716. 2 1, 212. 4	3. 590377 3. 433955 3. 083648
Mon. 637	48 102	59 18	55. 68 51. 62	90 99 223	55	34 37 06	243 269 279 43 142	57 52 16	44 18 18	Klitzke Mon. 635 Bien Spy_ Flax	5, 441. 9 2, 805. 7	3. 872504 3. 661954 3. 735750 3. 448035 3. 659200
Mon. 646	48 102		55. 85 47. 31	47 146 226	30	04 00 48	227 326 46	36 28 23	39	Center VI Oxbow Souris	619. 1 3, 956. 5 3, 961. 1	2. 791796 3. 597307 3. 597819
Mon. 647	48 102	59 00	55. 87 43. 15	17 89 187 247 296	59 10 13	47 28	197 269 7 67 116	02 58 11 17 53	05 00 45	Sherwood Mon, 646 Souris Glen School	2, 523. 9 2, 753. 5 7, 514. 6	3. 598844 3. 402070 3. 439891 3. 875904 3. 908142
Mon. 648			55. 89 49. 30	89 90 144 237 306	00 12 48	24 59 23	269 269 324 57 126	58 57 11 51 43	24 46 14	Mon. 647 Mon. 646 Souris Glen School	3, 367. 2 5, 454. 3	3. 364394 3. 684670 3. 527268 3. 736737 3. 786672
Mon. 655			56. 78 01. 89	37 129	13		217 309	11 35	28	Morse west base	4, 642. 0 164. 9	3. 666709 2. 217277
Mon. 658	48 101	59 41	57. 11 52. 80	45 90 127 326	52 59		225 270 307 146	04 48 56 19	52 59	Nelson	6, 410. 5 5, 335. 1	3, 781339 3, 806890 3, 727148 3, 648651
Mon. 659			57. 21 21. 36	89 197 350		38	269 17 170	53 05 39	16	Mon. 658 Fife Coutts		3. 269188 3. 538150 3. 575011

Station			e and ude	Azi	mut	h	Back a	zim	uth	To station	Distance (meters)	Logarithm
Mon. 662	° 48 101	, 59 35	57. 55 15. 73	o 143 181		" 11 10	323 1	, 26 45	77 27 15	Center IX Winter	2, 012. 7 4, 217. 6	3. 30377 3. 62506
Mon. 663 ecc	48 101		57. 68 28. 97	22 89 115 154		59 17 08 51	202 269 295 334	44 52 34 08	18 56 03 35	Simmons Mon, 662 Center IX Winter	2, 833. 3 2, 170. 0 3, 734. 6 4, 679. 7	3. 45229 3. 33646 3. 57224 3. 67021
Mon. 684			58. 38 42. 34	2 198	35 14		182 18	35 15	41 45	HopeSmart	3, 326. 0 4, 801. 4	3. 52192 3. 68137
Mon, 685	48 100	59 52	58. 32 58. 66	90 172 306		44 42 53	270 352 126	02 28	26 20	Mon. 684 Smart Center XV	2, 107. 4 4, 601. 3 6, 515. 9	3, 32375 3, 66288 3, 81397
Mon. 686			58, 25 13, 50	76 90 212 338		43 04 28 50	256 270 32 158	29 02 20 11	43 44 46 42	Center XV	1, 661. 4 2, 137. 6 3, 950. 1 3, 800. 1	3. 22048 3. 32991 3. 59660 3. 57979
Mon. 691			57. 98 03. 57	279 317	49 34	00 19	99 137	50 34	42 35	Souris east base Souris west base	2, 796. 9 638. 8	3. 44667 2. 80537
Mon. 692	48 100	59 38	57. 91 32. 32	33 79 90	56	04 47 23	213 259 270	50 55 01	52 09 29	Souris east base Souris west base Mon, 691	572. 4 2, 685. 0 3, 074. 5	2. 75767 3. 42894 3. 48777
Mon. 693	48 100		57.87 45.82	79 84 90		19 52 37	259 264 270	10 24 01	46 53 17	Souris east base Souris west base Mon. 692	2, 528. 5 4, 831. 2 2, 164. 7	3. 40286 3. 68403 3. 33540
Mon. 697	48 100	59 30	57. 73 45. 08	127	21	45	307	21	45	Bottineau	2.1	0, 3211
Mon, 699	48 100	59 25	57, 65 46, 44	161	25	36	341	25	36	Summit	3.8	0. 5774
Tub 41	48 100	59 13	57. 40 34. 13		45 17	36 37	184 10	45 17	24 58	AckFair	3, 876. 0 3, 129. 3	3. 5883 3. 4954
Aon. 708	48 100	59 10	57. 43 27. 84	90 133	00 40	35 23	269 313	58 38	14 23	Hub 41Fair		3. 5782 3. 6492
Center XVIII	48 100	59 10	35. 00 07. 89	54 99 136 149 273	23 05 39	53 44 44 01 05	234 279 316 329 93	54 21 03 38 56	06 08 29 46 09	Ack Hub 41 Fair Mon. 708 Worth	5, 235. 6 802. 8	3. 7417 3. 6283 3. 7189 2. 9045 3. 9931
Mon. 711			57. 34 02. 09	84 90 299	03	12 37 29	264 269 119	39 58 39	36 46 57	Center XVIII Mon. 708	7, 467. 7 7, 841. 0 2, 742. 7	3. 8731 3. 8943 3. 4381
Mon. 712	48 100	59 01	57. 30 38. 55	21 90	$\frac{31}{02}$	08 11	201 270	30 00	49 23	Worth Mon. 711	1, 457. 4 2, 917. 7	3. 1635 3. 4650
Ninga H		01 59	51.30 57.90	27 286 288 318	53 18 42 03	20 36 34 19	207 106 108 138	51 25 50 04	44 18 53 49	Worth Center XX St. Johns Center XIX	5, 517. 9 11, 262. 0 14, 177. 2 3, 607. 7	3. 7417 4. 0516 4. 1515 3. 5572
Mon. 713	48 99	59 59	57. 25 47. 28	64 90 249	03	30 06 04	244 270 69	08 01 05	46 42 26	Worth Mon. 712 Center XIX	3, 107, 2	3. 4923 3. 3544 3. 3712
Mon. 714			57. 24 37. 53	90 155 222	08	24 34 46	270 335 42		31 33 15	Mon. 713 Ninga H Center XIX	1, 417. 8 3, 883. 7 1, 144. 9	3. 1516 3. 5892 3. 0587
Mon. 715	48 99		57. 19 52. 95	79 90 108 125 266	02 09 20	51 38 38 02 55	259 270 288 305 86	49 00 08 16 34	10 34 03 57 32	Worth Mon. 714 Center XIX Ninga H Center XX	2, 701. 4 6, 099. 3	3. 8853 3. 5244 3. 4315 3. 7852 3. 7664
VIon. 716			57. 16 17. 01	90 117 264 279	00 47	08 50 03 28	270 296 84 99	00 56 49 06	56 33 27 29	Mon. 715. Ninga H. Center XX St. Johns	1, 950. 1 7, 772. 7 3, 896. 2 6, 579. 4	3. 2900 3. 8905 3. 5906 3. 8181
Aon. 717	48 99	59 52	57. 12 22. 56	90 90 110 257 283	02 54 09	30 59 59 31 06	270 270 290 77 103	01 00 49 10 58	03 20 15 29 41	Mon. 716 Mon. 715 Ninga H Center XX St. Johns	2, 326, 2 4, 276, 3 9, 901, 9 1, 593, 9 4, 297, 5	3. 3666 3. 6310 3. 9957 3. 2024 3. 6332
Mon. 718	48 99		57. 08 41. 11	90 124	02 58	53 24	270 304	01 58	37 05	Mon. 717 Center XX	2, 062. 3 620. 0	3, 3143 2, 7924
Mon. 719	48 99		57. 05 04. 72	90 98 104 254 351	01 13 57 54 48	57 36 36 06 56	270 278 284 74 171	00 12 49 56 49	44 04 23 37 02	Mon. 718 Center XX Ninga H Bannerman south base St. Johns.	1, 959. 2 2, 492. 8 13, 733. 8 4, 208. 3 1, 045. 0	3. 29208 3. 39669 4. 13779 3. 62410 3. 01912

Station		tude	and ide	Aziı	nutl	n	Back a	zim	uth	To station	Distance (meters)	Logarithm
Mon. 720	6 48 99	59 46	56, 99 43, 14	69 90 227	17 03 14		249	15 01 14		St. Johns Mon. 719 Bannerman south base	2, 918. 2 2, 877. 9 1, 615. 1	3. 465111 3. 459070 3. 208189
Mon. 721	48 99	59 45	57. 06 23. 50	76 89 158	38 55 25	13 55 33	256 269 338	35 54 25	32 55 17	St. Johns Mon. 720 Bannerman south base	4, 469. 7 1, 618. 7 1, 176. 8	3. 650276 3. 209178 3. 070688
Mon. 722	48 99	59 44	57. 13 06. 64	80 89 118	04 55 42	51 47 35	260 269 298	01 54 41	11 49 21	St. Johns Mon. 721 Bannerman south base	6, 001. 0 1, 562. 3 2, 274. 3	3. 77822 3. 19377 3. 35685
Mon. 728	48 99	59 32	57. 79 25. 05	46 137	31 53	23 22	226 317	29 53	54 22	PriseCenter XXIII		3. 52150 0. 46310
Mon. 729	48 99	59 30	57. 90 33. 12	89 305	58 18	52 46	269 125	57 20	27 27	Center XXIII		3. 35736 3. 52325
Mon. 730	48 99	59 28	57. 99 51. 62	89 341	55 10	38 33	269 161	54 10	21 57	Mon. 729 Field	2, 063. 0 2, 041. 3	3.31450 3.30990
Mon. 731	48 99	59 27	58. 09 09. 96	36 89 287	03 55 48	04 44 50	216 269 107	02 54 53	12 27 45	Field_ Mon. 730 Hans	2, 393. 3 2, 066. 4 8, 362. 2	3. 37898 3. 31521 3. 92232
Hub 2	48 99	59 23	58. 30 26. 92	71 89 306	56 56 52	10 22 27	251 269 126	52 53 54	29 33 34	Field Mon. 731 Hans	4, 533. 7	3.79601 3.65645 3.63165
Mon. 733	48 99	59 23	58. 29 38. 48	269	55	40	89	55		Hub 2		2. 37085
Mon. 740	48 99	59 13	58. 96 29. 64	116 207 304	37	57 21 48	296 27 124	38	03 36 51	Wright_ ClearRidge	4, 382, 8	3. 94600 3. 64175 3. 60238
Mon. 742			59. 11 40. 53	3 78 89 109 160 237	19 00 56 11 06 10	13 40 41 41 55 29	183 257 269 289 340 57	19 53 54 04 06 13	08 09 33 40 03 37	Ridge	12, 430. 6 3, 437. 3 12, 003. 0 4, 124. 6	3. 35483 4. 09449 3. 53622 4. 07928 3. 61538 3. 77844
Mon. 745	48 99		59. 47 41. 21	69 162 332		43 18 30	249 342 152	53 16 49	52 39 31	Ridge	3, 402. 5	3. 82078 3. 53180 3. 55368
Mon, 752	48 98		59. 91 47. 15	64 186 235 298	21 25	15 19 21 38	244 6 55 118	29	34	Mott Crystal City Badger	3, 550. 5 7, 415. 1	3. 875028 3. 55028 3. 87011 3. 86806
Mon. 753	49 98		00. 04 27. 78	89 226 306	54	03 47 49	269 46 126	57	34	Mon. 752_ City_ Badger	6, 152. 3	3. 2077; 3. 7890- 3. 7795;
Hub 5	49 98	00 50	00. 27 58. 09	234 269		24 01	54 90			Star MoundHannah	11, 277. 5 9, 506. 2	4, 0522 3, 97800
Mon. 758	49 98		00. 27 50. 85	89	57	44	269	57	38	Hub 5	147. 2	2, 16778
Mon. 761	49 98	00 46	00.35 52,58	89 212 269	06	48 48 14	269 32 89		22	Hub 5 Star Mound Hannah	7, 802. 4	3. 69813 3. 89223 3. 65473
Mon. 764			00. 45 54. 35	1	00			00		Hannah		2, 5138
Mon. 765	49 98	00	00. 47 40. 05	89 181			269 1		17 18	Hannah Hannah south base	1, 836. 7 1, 151. 3	3. 26404 3. 06118
Hub 9	49 98		00. 55 17. 47	89 89 124 157	58 56	04 30	269 269 304 337	55	53 29	Mon. 765. Hannah Hannah south base Hannah north base	3, 515. 2 2, 005. 4	3. 22490 3. 54594 3. 30219 3. 62957
Mon. 766	49 98		00. 50 13. 08		05		11,77910	05		Hub 9	200.00	1, 95080
Hub 10	1.55.50	00	00. 51 07. 64	89 90 90 110 141	00 03 35	15 31 08	269 269 270 290 321	57 02 33	12 39 15	Mon. 766_ Hannah Hub 9 Hannah south base_ Hannah north base_	4, 934. 6 1, 419. 4 3, 271. 9	3. 12389 3. 69324 3. 1521 3. 5148 3. 6980
Mon. 767	49 98		00. 51 55. 93	1100	00		270			Hub 10	April 200	2. 3764
Hub 12	49 98	00	00. 66 06. 64	90 98 116 122	13	28	269 278 296 302	08 08	32 48	Hannah Hannah south base Hannah north base Star Mound	8, 043. 2 8, 887. 0	3, 99269 3, 90542 3, 94873 4, 08419
Mon. 770	49		00. 61 58. 00		31				13	Hub 12		2, 24473

Station		Latitude and longitude			Azimuth			zim	uth	To station	Distance (meters)	Logarithm
Mon. 788	49	00	00. 91 11. 04	° 273	05	24		, 05		South Pembina	389. 3	2, 590288
Mon. 798			01. 60 58. 42	91 100 120 210	39 21 38 03	20 57 39 54	271 280 300 30	32 16 32 04	32 15 56 07	Birch	10, 994. 8 9, 345. 3 10, 703. 2 714. 6	4. 041186 3. 970592 4. 029514 2. 854045
Mon. 800			01. 69 19. 72	89 97 102 113 224 243	58 43 07 42 21 10	01 39 54 29 26 45	269 277 282 293 44 63	56 35 06 34 21 13	01 58 07 47 56 23	Mon. 798. South Outlook Haskett south base station North Outlook Kloss. Center XXVIII	3, 225. 7 12, 531. 3 2, 932. 9 13, 576. 9 1, 168. 6 4, 761. 4	3. 508627 4. 097996 3. 467293 4. 132800 3. 067655 3. 677734
Mon. 803	49 97		01. 79 21. 87	164 235	46 24	40 05	344 55	46 24	18 50	Center XXVIIIBerg	2, 221. 7 1, 476. 8	3. 346676 3. 16932
Mon. 804	49 97	00 50	01. 82 01. 94	89 134 174 219	58 09 05 00	36 18 21 31	269 314 354 39	57 07 05 02	36 56 02 57	Mon. 803. Center XXVIII. Rhine. Plum		3. 210768 3. 488080 3. 694630 3. 793010
Mon. 805			01. 86 50. 23	89 173 206	57 29 56	14 49 57	269 353 26	56 29 58	20 37 28	Mon. 804 Center XXIX Plum	1, 457. 6 2, 772. 6 5, 409. 8	3. 163637 3. 442888 3. 733188
Mon. 806	49 97	00 47	01. 89 23. 27	89 142 188 227 259	59 55 05 06 02	03 59 46 30 57	269 322 8 47 79	57 54 06 08 03	58 42 11 14 37	Mon. 805 Center XXIX Plum Center XXX Wall	1, 767. 5 3, 451. 9 4, 869. 6 3, 817. 6 1, 086. 3	3. 247352 3. 538057 3. 687497 3. 581788 3. 035948
Mon, 807	49 97	00 46	01. 93 04. 04	89 169 204	57 09 34	56 27 23	269 349 24	56 08 35	56 52 07	Mon. 806 Plum Center XXX	1, 610. 4 4, 907. 6 2, 855. 1	3. 206940 3. 690865 3. 455618
Mon. 808			01. 96 40. 23	89 95 168	58 11 46	29 59 06	269 275 348	57 10 45	26 35 47	Mon. 807 Wall Center XXX	1, 703. 5 2, 256. 5 2, 646. 1	3. 231333 3. 353435 3. 422600
Mon. 809			01, 99 25, 36	89 93 141 188 298	58 06 52 12 31	33 19 27 17 57	269 273 321 8 118	57 03 51 12 32	37 59 11 37 40	Mon. 808. Wall Center XXX Glen Cross.	1, 521. 9 3, 774. 6 3, 298. 6 3, 835. 9 1, 321. 1	3. 18237 3. 57686 3. 51833 3. 58386 3. 12091
Mon. 810	49 97	00 42	02. 04 06. 09	35 89 125 164 235	28 57 25 21 38	44 21 30 22 29	215 269 305 344 55	28 56 23 20 40	27 21 14 42 18	Cross	776. 8 1, 611. 3 4, 475. 6 3, 941. 2 3, 571. 5	2. 89032 3. 20717 3. 65085 3. 59563 3. 55284
Mon. 811			02. 04 47. 43	72 90 116 213		26 23 40 26	252 269 296 33	50 59 16 50	10 23 25 16	Cross_ Mon. 810 Center XXX_ Center XXXI	2, 145, 1 1, 598, 8 5, 852, 1 2, 425, 5	3, 33145- 3, 203789 3, 767313 3, 384799
Mon. 812			02. 01 27. 96	80 90 110		17 17 38	260 270 290	12 01 40	01 17 23	Cross_ Mon. 811 Center XXX	3, 719. 2 1, 615. 3 7, 335. 2	3. 570456 3. 20826 3. 86541
Mon. 813			02. 01 08. 53		16	30 51 30	269 285 356	59 16 41	30 44 21	Mon. 812 Buy Lowe	1, 614. 6	3. 208057 2. 273900 3. 601276
Mon. 814			01. 97 49. 12			16 50 31 06	270 271 335 89			Mon. 813_ Buy_ Lowe Neche_	1, 614. 0 1, 796. 0 4, 393. 1 3, 236. 8	3. 20790 3. 254290 3. 64277 3. 51011
Mon. 816	49 97	00 34	01, 93 10, 46	213 269		24 54	33 89	43 51	25 41	Neche	21. 5 1, 267. 6	1. 333129 3. 102990
Mon. 817	49 97	00 32	01. 92 51. 06	90 269	37 56	04 32	270 89	36 57	51 52	Neche west base Neche east base	346. 4 2, 142. 6	2, 539583 3, 330946
Mon. 818	49 97	00 31	01.89 31.78	269	43	47	89	44	07	Neche east base	531. 2	2, 72521
Mon. 823	49 97		01.81	10 174		05 55	190 354	20 55	53 44	Den	1, 865. 5 3, 293. 2	3, 27080 3, 51762
Mon. 824	49 97		01.79	46 90 149 202 236	44	23 09 13	226 270 329 22 56	43 01	11	Den Mon. 823 More. Center XXXV Let.	2, 676. 2 1, 613. 2	3. 42752 3. 20769 3. 57903 3. 14111 3. 77405
Mon. 830	49 97	00 15	01.71 40.61	199 345	44 16	58 46	19 165	45 17	42 11	WetNash	3, 489, 6 2, 660, 1	3, 542780 3, 424904
Mon. 832		00	01. 70 15. 65	22 90 170 251	14 01		202 270 350 71	13 00 32 38	32 13 45 50	Nash Mon. 830 Wet Emerson	2, 779. 1 1, 726. 8 3, 329. 8 1, 845. 4	3, 443898 3, 237249 3, 52242 3, 266083

SUMMIT OF ROCKY MOUNTAINS TO LAKE OF THE WOODS, MINOR SCHEMES-Continued

Station			e and ude	Azi	mut	h	Back a	azim	uth	To station	Distance (meters)	Logarithm
Mon. 833			01. 65 02. 05	90 203 320	04 40 51	29	270 23 140		05 38 51	Mon. 832 Emerson Barnet	1, 495. 9 636. 4 3, 285. 4	3, 174910 2, 803750 3, 516586
Emerson meridian mark	48 97	59 12	07.75 34.62	161 172 300	29 20 13	13 59 32	341 352 120	28 20 14	52 48 28	Mon. 833 Emerson Barnet	1, 756. 0 2, 268. 2 1, 754. 5	3. 244523 3. 355672 3. 244159
Emerson railroad tower			02.83 10.55	16 88 124 338	02 00 38 20	47 40 02 27	196 268 304 158	$02 \\ 00 \\ 37 \\ 21$	29 01 32 05	Emerson meridian mark Mon. 833 Emerson Barnet	1, 770. 5 1, 047. 4 961. 5 2, 781. 3	3. 248098 3. 020131 2. 982963 3. 444242
Emerson astronomic station			05. 73 34. 64	77 146 280 330 359	15 34 21 26 59	21 26 54 45 11	257 326 100 150 179	15 34 22 27 59	00 15 12 41 11	Mon. 833 Emerson Emerson railroad tower Barnet Emerson meridian mark	571. 2 547. 4 497. 8 3, 074. 4 1, 791. 1	2. 756796 2. 738282 2. 697049 3. 487756 3. 253127
Emerson astronomic station ecc			05. £6 32. 65	84 142 281 331	56 46		264 322 101 151	12 55 46 09	51 51 57 31	Emerson astronomic station Emerson Emerson railroad tower Barnet	40, 66 567, 4 458, 9 3, 058, 2	1. 609167 2. 753873 2. 661697 3. 485467
Sub			28. 95 45. 36	11 84 191 282	48	$30 \\ 07 \\ 22 \\ 41$	191 264 11 102	05 48	04 34 41 01	Barnet Emerson Elkins States	3, 464. 5 2, 536. 0 2, 488. 3 3, 874. 9	3, 539639 3, 404157 3, 395897 3, 588259
Emerson Presbyterian church spire	49 97	00 12	29, 48 29, 41	5 55 270 335 337	50 26	02	185 235 90 155 157		48 53 21 20 20	Emerson astronomic station ecc Emerson Sub Emerson railroad tower Barnet	732. 6 493. 0 2, 114. 8 908. 1 3, 688. 2	2. 864842 2. 692830 3. 325260 2. 958135 3. 566818
Mon. 835			01. 55 24. 89	23 91 153 270	03 49	25	203 271 333 90	46 02 49 04	51 29 10 20	Barnet Emerson railroad tower Sub- States	2, 781, 8 2, 148, 2 943, 0 3, 364, 8	3. 444332 3. 332066 2. 974527 3. 526964
Mon. 834 ecc			01. 61 37. 28	93 231 270 352	19 03	45 47	273 51 90 172	04	58 24 41 52	Emerson railroad tower Sub Mon. 835 Barnet	677. 3 1, 351. 7 1, 471. 5 2, 571. 3	2. 830781 3. 130872 3. 167775 3. 410146
Mon. 834			$01.61 \\ 42.76$		48 01	38 14	273 90	48 01	17 18	Emerson railroad tower Mon. 834 ecc	566. 3 111. 22	2. 753034 2. 046183
Red barn	48 97	59 09	25. 26 34. 82	110 137 143 244	46 55	52 18 30 36	290 317 323 64	54	55 40 37 03	Emerson railroad tower Mon. 835 Sub States	3, 371. 6 1, 514. 0 2, 434. 2 2, 600. 1	3, 527842 3, 180127 3, 386364 3, 414983
Mon. 836 ecc			01. 05 04. 32	29 90 269	17 32 35	22 43 20	209 270 89	16 31 36	59 43 24	Red barn Mon. 835 States	1, 267. 7 1, 637. 7 1, 727. 3	3. 103004 3. 214224 3. 237366
Mon. 836	49 97	00 09	01. 51 04. 06	20	36	45	200	36	45	Mon. 836 ecc	14. 95	1. 174641
Mon. 837	49 97	00 07	01. 46 44. 74	270	11	38	90	11	42	States	109, 68	2. 040127
Mon. 838			01. 44 25. 37	90 207 325	$01 \\ 22 \\ 13$	11 18 26	270 27 145	$00 \\ 23 \\ 14$	21	StatesShultzFinney	1, 503. 5 3, 716. 6 2, 970. 4	3. 177111 3. 570146 3. 472808
Mon. 839	25.00	A 10	01. 35 06. 02	90 287	04 06 57 06	15 07	270 270 108 178	05	21 15 33 24	States	3, 116. 4 1, 612. 9 9, 232. 0 2, 438. 7	3. 493656 3. 207606 3. 965297 3. 387159
Mon. 840	49 97	00 03	01. 29 46. 72	- 80 80	$10 \\ 04 \\ 04 \\ 23$	57	212 270 270 335	$\frac{03}{02}$	01	Finney Mon. 839 States Shultz	2, 877. 2 1, 611. 9 4, 728. 4 3, 635. 3	3. 458969 3. 207350 3. 674711 3. 560536
Mon. 841			01. 25 27. 39	90 90 136	16 03 05 36 07	26 18	232 270 270 316 117	$02 \\ 01 \\ 35$	27 23 00	Finney	3, 976. 5 1, 612. 3 6, 340. 7 4, 550. 3 6, 243. 3	3. 599503 3. 207456 3. 802138 3. 658039 3. 795413
Mon. 842	49 97	00 01	01. 20 08. 00			31	242 270 304 125	02 53		Finney Mon. 841 Shultz Joe	5, 344. 3 1, 613. 8 5, 779. 7 4, 862. 3	3. 727894 3. 207838 3. 761906 3. 686843
Mon. 843	49 96	00 59	01. 23 48. 64	89 90	07 58 05 31 44	55 25 56	249 269 269 297 140	57 59 28	52 55 30 00 37	Finney Mon. 842 States Shultz Joe	6, 820. 8 1, 613. 1 9, 567. 5 7, 161. 5 3, 678. 6	3. 833837 3. 207653 3. 980799 3. 855004 3. 565683

Station		itud ngiti	e and ude	Aziı	nut	h	Back a	zim	uth	To station	Distance (meters)	Logarithm
Mon. 844	o 49	00	01, 12	90	, 03	// 50	° 270	, 01	50	Mon. 842	3, 226, 2	3, 508683
Mon. ori			29. 28	90 345	07 54	44 29	270 165	06 54	44 55	Mon. 843	1, 613. 1 2, 933. 5	3. 207657 3. 467379
Mon. 848	49 96		00. 97 11. 94	90	03	38	270	03	37	Canada	25. 32	1. 403464
Erca.	49 96		00. 74 08. 18	90 141 295	05 21 33	36 32 49	270 321 115	01 19 38	00 57 09	Canada Shock Wood	7, 419. 0 4, 098. 2 7, 756. 4	3. 870344 3. 612589 3. 889659
Mon. 853			00. 74 35, 38	90	00	08	269	59	43	Erca	666.72	2. 823944
Mon. 864	49 96		00. 57 02. 37	270	04	03	90	04	22	Roseau	515. 01	2. 711816
Mon. 877	49 96	00 14	00. 12 45. 17	90 176	04 58	46 30	269 356	58 58	47 27	Mon. 871	9, 672. 6 1, 649. 4	3. 985542 3. 217337
Mon. 912	48 95	59 17	55, 96 06, 10	90	10	08	270	06	03	Warroad north base=Mon.	6, 591. 5	3. 818986
				268 313	$\frac{43}{06}$	$\frac{24}{02}$	88 133	$\frac{45}{12}$	47 56	Buffalo_ Willow, 1913	3, 858. 0 15, 302. 6	3. 586366 4. 184768
Mon. 925	49 95		39. 26 11. 32	359	58	53	179	58	53	Mon. 913	21, 902. 5	4, 340494
Turning Point 1, Northwest Angle Inlet, Lake of the Woods. 1	49 95	23 09	04. 14 11. 34	359	58	53	179	58	53	Mon. 925	768.8	2, 88581
Ref. Mon. 1	49 95	23 08	04. 15 48. 28	31 89	09 58	24 48	211 269	09 58	06 31	Mon. 925 T. P. 1, Northwest Angle Inlet	898. 6 465. 1	2, 95355 2, 66753
Ref. Mon. 2	49 95	23 09	04. 13 30, 50	269 269 333	58 58 16	16 16 42	89 89 153	58 58 16	48 31 57	Ref. Mon. 1 T. P. 1, Northwest Angle Inlet. Mon. 925	851. 7 386. 6 860. 5	2, 93029 2, 58729 2, 93475

¹ This is the point adopted in lieu of the original Northwesternmost Point of Lake of the Woods in accordance with the provisions of the treaty of 1925.

DESCRIPTIONS OF TRIANGULATION AND TRAVERSE STATIONS

The stations in the following list are arranged according to the class of triangulation to which they belong and also in the order in which they are listed in the tables of geographic positions. Boundary monuments used as triangulation stations are not described herein, as it is believed they can always be identified by the general description of the types of monuments on page 115 of this report. Other stations omitted from this list are those marked in a temporary manner, used but once, or no longer recoverable.

Within the parentheses in each description immediately following the name of the station is the name of the Province or State, the district or county in which the station is situated, and the name of the Government organization or the member of the boundary survey party that established the station. The person named is generally the chief of party; in some cases, however, he is the member of the party who was responsible for the measurement of the angles. This association of the name of the station with the name of the person who established the station and whose name appears on the field notebooks is intended to facilitate, in later years, any reference to these data in the Government archives. The first date within the parentheses is that of the establishment of the station; the last date is the year in which the station was last occupied or inspected.

All azimuths given in the descriptions are reckoned continuously from true south around by west to 360°, south being 0°, west 90°, north 180°, and east 270°. Where magnetic bearings are given they are indicated as such. All distances are horizontal unless otherwise stated.

The station marks vary so much in character that they have in most cases been described for each station. However, a considerable number of stations established by the Geodetic Survey of Canada were marked in a uniform manner, and the station marks for these have been described as "A standard Geodetic Survey of Canada station mark; see page 333" or "A standard U. S. Coast and Geodetic Survey station mark; see page 333." The reference is to the following note:

For stations established in Canada by the Geodetic Survey of Canada and described in this report, the standard station mark consists of a subsurface mark and a surface mark. The subsurface mark is a bronze disk 3 inches in diameter, stamped "GEODETIC SURVEY OF CANADA TRIANGULATION STATION", set in the center of the top of a rectangular block of concrete 1 foot 6 inches square and 2 feet high. The base of the block is 6 feet underground. The surface mark is a like bronze disk set in the center of the top of a block of concrete 1 foot 6 inches square at the base, 1 foot square at the top, and 5 feet 6 inches high. The base of this upper block of concrete rests upon the top of the subsurface block, separated from it by a sheet of tarred paper. The top of the upper block projects 1 foot 6 inches above the ground. The surface mark is centered vertically over the subsurface mark.

For stations established in the United States by the Geodetic Survey of Canada and described in this report, the standard station mark is the same as just described except that the bronze disks are inscribed "U. S. COAST & GEODETIC SURVEY TRIANGULATION STATION."

Any person who finds that a boundary monument or station described in this list has been disturbed or damaged is requested to send such information to the Commissioner, International Boundary Commission, Washington, D. C., or Ottawa, Ontario.

GEORGIA STRAIT TO LAKE OF THE WOODS, FIRST-ORDER SCHEME

Benson (British Columbia, Vancouver Island District; Geodetic Survey of Canada, 1911).—Near the summit of Mount Benson about 7 miles southwest of Nanaimo, British Columbia, whence a wagon road leads to within a mile of the station and a good trail continues the rest of the way. The station is on the southernmost of the three peaks that form the summit of the mountain and is about 135 meters southeast of the highest peak of the mountain. It is the same point that was used as triangulation station "Benson" in 1909, re-marked in a more permanent manner.

Station mark: A copper bolt ¾ by 4 inches in size set in a drill hole in solid rock. The reference marks are three arrows pointing toward the station; they are cut in the rock and marked with copper bolts at their points. Their directions and distances from the station are as follows: Triangulation station "Shepherd", 0°00′; first reference mark, 84°06′, 6.46 meters from the station; second reference mark, 143°28′, 10.55 meters from the station; third reference mark, 279°55′, 5.00 meters from the station.

Gardner (British Columbia, New Westminster District; Geodetic Survey of Canada, 1911).—On the summit of Mount Gardner, the highest point on Bowen Island, which is about 10 miles northwest of Vancouver, British Columbia.

Station mark: A copper bolt ¾ by 4 inches set in the rock with a triangle cut around it. The reference marks are three arrows pointing toward the station; they are cut in the rock with copper bolts set at their points. Their directions and distances from the station are as follows: Point Atkinson Lighthouse, 0°00′; first reference mark, 84°26′, 5.30 meters from the station; second reference mark, 189°02′, 5.91 meters from the station; third reference mark, 354°57′, 6.34 meters from the station.

Little Mountain (British Columbia, New Westminster District; Geodetic Survey of Canada, 1920).—On the highest point of Little Mountain, now owned by the City of Vancouver, British Columbia, as a reservoir site. The reservoir enclosure takes in an area of about 10 acres; the reservoir is of considerably less area. The ground surrounding the reservoir is cleared and kept in good order and the whole is protected from the public by a high fence. The station is within the fence quite near the north corner of the property.

Station mark: A copper bolt set in the center of the top of a large concrete pier.

Delta West Base (British Columbia, New Westminster District; Geodetic Survey of Canada, 1913; International Boundary Commission, 1934).—About 3½ miles south of Ladner, British Columbia, and in SE¼ sec 22, T. 5, New Westminster District. The station is about 460 meters west of the Ladner-Point Roberts road and is a few feet north of the south fence line of a plowed field. A tower is required at the station to see "Delta East Base."

Station mark: A ¾-inch copper bolt set in a concrete slab 4 feet square and 8 inches thick placed 2 feet 8 inches below the surface of the ground. The reference mark is a concrete monument about 3 feet high set in the west fence line of the Ladner-Point Roberts road 459.11 meters from the station in azimuth 270°32′13″.

Delta East Base (British Columbia, New Westminster District; Geodetic Survey of Canada, 1913; International Boundary Commission, 1934).—About 7½ miles east and a little south of Ladner, British Columbia, and in SE¼ sec. 2, T. 4, New Westminster District. It is a short distance south of the Ladner-Cloverdale road. A tower is required at the station to see "Delta West Base."

Station mark: A ¾-inch copper bolt set in a slab of concrete 4 feet square and 8 inches thick placed 2 feet 10 inches below the surface of the ground. The reference mark is a concrete monument about 3 feet high set in the fence, 323.42 meters from the station in azimuth 179°05′03″.

Bruce (British Columbia, Vancouver Island District; Geodetic Survey of Canada, 1911; 1921).—On the south end of Salt Spring Island off the east coast of Vancouver Island. The station is on the summit of Bruce Mountain. It is most easily approached from Fulford Harbor.

Station mark: A copper bolt ½ by 4 inches set in rock with a triangle cut in the rock around it. The reference marks are two arrows pointing toward the station; they are cut in the rock with copper bolts set at their points. The first reference mark is 6.93 meters from the station in azimuth 349°23′04″. The second reference mark is 6.63 meters from the station in azimuth 144°35′52″.

Birch Point (Washington, Whatcom County; Geodetic Survey of Canada, 1912; U. S. Coast and Geodetic Survey, 1926; International Boundary Commission, 1934).—About 5 miles south of Blaine, Washington, on the high bluff at the western extremity of Birch Point.

Station mark: A copper bolt ¾ by 4 inches set in a small granite boulder 15 inches below the surface of the ground. In 1926 a standard U. S. C. & G. S. bronze-disk station mark was set in concrete over the copper bolt. The reference mark is the old U. S. C. & G. S. station "Birch Point" of 1858. It is marked by a ½-inch drill hole 2 inches deep in the top of a boulder about 12 by 15 feet in size which is deeply embedded in the beach gravel and rises about 4 feet above the beach level. The letters and figures "U. S. C. S. 1858" are cut in the rock near the drill hole. The reference mark is at the foot of the bluff, 58.38 meters from the station, in azimuth 94°02′14″.

Douglas (British Columbia, Vancouver Island District; Geological Survey of Canada, 1909; Geodetic Survey of Canada, 1911; U. S. Coast and Geodetic Survey, 1926).—About 5 miles north of Victoria, British Columbia, on the summit of Mount Douglas, locally known as Cedar Hill.

Station mark: The point was found in 1911 marked by a drill hole within a triangle cut in the rock. The drill hole was enlarged and a ¾- by 4-inch copper bolt was leaded into it. The reference marks are three arrows pointing toward the station; they are cut in the rock and have copper bolts set at their points. The first one is 9.72 meters from the station in azimuth 175°13′; the second is 11.57 meters from the station in azimuth 277°32′; the third is 3.29 meters from the station in azimuth 354°10′.

Constitution (Washington, San Juan County; Geodetic Survey of Canada, 1911; U. S. Coast and Geodetic Survey, 1926).—On the summit of Mount Constitution on Orcas Island, about 15 miles west of Bellingham, Washington. It may be reached by boat from Bellingham to Olga on East Sound, whence a good wagon road leads to the top of the mountain. This station is near the old U. S. C. & G. S. station "Constitution", but no trace of the old station was found.

Station mark: A copper bolt \(^3\)/4 by 4 inches leaded into a drill hole in the rock with a triangle cut around it. The reference marks are two arrows pointing toward the station, cut in the rock and having copper bolts set at their points. The first reference mark is 7.165 meters from the station in azimuth 209°27'; the second reference mark is 4.250 meters from the station in azimuth 327°47'.

Discovery (British Columbia, Vancouver Island District; U. S. Coast and Geodetic Survey, 1854; International Boundary Commission, 1910; U. S. Coast and Geodetic Survey, 1926).—On Discovery Island, off the southeastern part of Vancouver Island and on the west side of the south entrance to Haro Strait. The station is on the highest part of the rocky bluff 200 paces west-of-north from the Discovery Island lighthouse.

Station mark: The original mark was a drill hole in a depression in the rock. In 1910 a concrete pier was built over the drill hole, 11 inches square and 4 feet high. A copper wire was extended vertically through the pier from the drill hole to the top where it now serves as a center mark for the station. The reference mark is a nail in a manzanita tree bearing north 27° west (magnetic) 30.56 meters distant from the station.

Iceberg (Washington, San Juan County; U. S. Coast and Geodetic Survey, 1854; 1927).—On Lopez Island about ¾ mile from the southwest end and on the high rocky bluff about 60 meters above high water. About 9 meters east of the station are some deep furrows traced by the action of ice and boulders, the principal one being 15 meters long and 2 or 3 meters deep. Their general direction is north and south. The station is easily found by the proximity of the large concrete reference monument set by the International Boundary Commission in 1909. This monument is a concrete shaft about 5 feet high set on a pedestal 3 feet square and bears the inscription "TREATY OF 1908" on the west side, and "U. S. REFERENCE MARK" on the east side.

Station mark: A ½-inch drill hole 2½ inches deep in solid rock. A small drill hole in the top of an International Boundary Commission reference monument is 9 meters from the station in azimuth 29°14′. A nail set in a triangular patch of cement is 26.435 meters from the station in azimuth 285°54′.

Parke (British Columbia, Nanaimo District; Geodetic Survey of Canada, 1911).—On the summit of Mount Parke, locally called Signal Hill, the highest point on Mayne Island, British Columbia. Mayne Island may be reached by steamer from Victoria, landing at Active Pass.

Station mark: A copper bolt set in soft rock. One reference mark is a copper bolt 5.58 meters from the station in azimuth 43°39′. Two other reference marks are fir trees; the first is 19.72 meters from the station in azimuth 246°31′; the second is 21.49 meters from the station in azimuth 328°39′.

Avenue (British Columbia, New Westminster District; Geodetic Survey of Canada, 1911; 1931).—On the high bluff on the west shore of Point Roberts and about 25 meters north of the International Boundary. This is not the original U. S. Coast and Geodetic Survey station "Avenue", which was in the same locality.

Station mark: A copper bolt ¾ by 4 inches set in a boulder 1 foot below the surface of the ground. The subsurface mark is a like bolt set in a boulder buried 27 inches underground. The station mark is 39.15 meters, in azimuth 136°02′, from the center of the large granite monument, Monument 1, of the International Boundary.

Whatcom (Washington, Whatcom County; U. S. Geological Survey, 1905; U. S. Coast and Geodetic Survey, 1926).—On the north end of Lookout, or Whatcom, Mountain which lies between Whatcom and Samish Lakes about 6 miles southeast of Bellingham, Washington. The station is on the bare rocky summit. The south end of the mountain or ridge has a summit of about the same elevation about three-fourths mile south of the station, but it is heavily timbered.

Station mark: A bronze-disk station mark set in a large sandstone outcrop. Two drill holes in the same rock, close together, are 1.1 meters from the station. The U. S. Coast and Geodetic Survey established a first-order triangulation station about 0.2 meter southeast of the original station mark. The U. S. C. & G. S. station mark is a standard U. S. C. & G. S. bronze-disk station mark wedged in a drill hole in the same outcropping rock that the original mark is set in. A standard U. S. C. & G. S. bronze-disk reference mark, with the arrow pointing toward the U. S. C. & G. S. station, is wedged in a drill hole in outcropping bedrock 18.743 meters from the U. S. C. & G. S. station, in azimuth 251°47′. A like reference mark, set in the same manner, is 15.266 meters from the station in azimuth 318°39′.

Sumas (Washington, Whatcom County; U. S. Coast and Geodetic Survey, 1926; International Boundary Commission, 1935).—On the north spur of Nooksack Mountain about 5 miles east of Everson, Washington. The station is not on the highest point of the mountain. It is at the end of a trail from the hillside farm of P. Serverson.

Station mark: A standard U. S. C. & G. S. bronze-disk station mark set in a small boulder buried 1 foot underground. There are two reference marks. Reference mark No. 1 is a standard U. S. C. & G. S. bronze-disk reference mark, with the arrow pointing toward the station, wedged in a drill hole in outcropping bedrock 57.582 meters from the station; the azimuth is not given. Reference mark No. 2 is a like bronze disk set in the same manner 4.862 meters from the station; the azimuth is not given.

Sisters (Washington, Whatcom County; E. C. Barnard, 1905; U. S. Coast and Geodetic Survey, 1926).—On the highest peak of the Twin Sisters Range, the second peak from the north end of the range, and about 17 miles southeast of Deming, Washington. The station is on the southeast end of the peak. It is most readily approached from Deming.

Station mark: A bronze-disk station mark set in outcropping bedrock with a 7-foot cairn built over it. In 1926 the U. S. Coast and Geodetic Survey established a first-order triangulation station about 20 inches north-west of the station and marked it as follows: A standard U. S. C. & G. S. bronze-disk station mark wedged in a drill hole in outcropping bedrock marks the station; a standard bronze-disk reference mark, with the arrow pointing toward the station, wedged in a drill hole in outcropping bedrock is 4.72 meters from the station mark in azimuth 310°52′39″; a second and like reference mark is set in the same manner 14.37 meters from the station in azimuth 100°45′29″.

Church (Washington, Whatcom County; E. C. Barnard, 1905; U. S. Coast and Geodetic Survey, 1925; International Boundary Commission, 1935).—On the highest point on the west end of Church Mountain, a well-known mountain on the north side of the Nooksack River about 5 or 6 miles upstream from the town of Glacier, Washington. There is a good highway up the river and the station is best approached from it.

Station mark: The station mark of the original station is not recorded. The station was reestablished in 1925 by the U. S. Coast and Geodetic Survey at a point very close to the original station, but no station mark was recovered. The U. S. C. & G. S. station mark is a standard bronze-disk station mark wedged in a drill hole in outcropping bedrock. A standard bronze-disk reference mark wedged in a drill hole in outcropping bedrock, with the arrow pointing toward the station, is 6.05 meters in azimuth 238°37′ from the station. A second standard bronze-disk reference mark wedged in a drill hole in outcropping bedrock is 1.88 meters in azimuth 350°30′ from the station.

Bacon (Washington, Whatcom County; E. C. Barnard, 1905; U. S. Coast and Geodetic Survey, 1926).—On the highest of several rocky peaks lying at the heads of the west fork of Bacon Creek and the east fork of Baker River, and a little north of the head of Diaposse Creek—all tributary to the Skagit River. Although the station is but little above the timber line, it is surrounded by heavy glaciers which must be crossed to reach it. Consequently, for safety, it should be occupied in July or August. Heretofore it has been reached from the west fork of Bacon Creek.

Station mark: A bronze disk, cemented in outcropping bedrock, with a 7-foot cairn built over it. The station was recovered in 1926 by the U. S. Coast and Geodetic Survey and a first-order triangulation station was established about 10 inches north of the original station mark. The U. S. C. & G. S. station mark is a standard bronze-disk station mark wedged in a drill hole in outcropping bedrock. A standard bronze-disk reference mark wedged in a drill hole in outcropping bedrock, with the arrow pointing toward the U. S. C. & G. S. station mark, is 8.580 meters distant in azimuth 222°30′33″ from the U. S. C. & G. S. station mark. A second standard bronze-disk reference mark wedged in a drill hole in outcropping bedrock is 7.135 meters distant in azimuth 8°21′58″ from the U. S. C. & G. S. station.

Glacier (Washington, Whatcom County; E. C. Barnard, 1904; U. S. Coast and Geodetic Survey, 1926).—On the highest peak of the Custer Ridge; about 2 miles south of the International Boundary and about 7 miles west of the Skagit River. The peak is pyramidal in shape, is surrounded by glaciers, and is difficult and dangerous to climb. It probably can be best approached from the Boundary ranger station of the United States Forest Service on the Skagit River.

Station mark: A standard station-mark disk stamped "U. S. & C. B." set in a drill hole in outcropping bedrock. The U. S. Coast and Geodetic Survey recovered the station in 1926 and reported that the rock in which the disk is set is not solid now. They established and marked a first-order triangulation station 1.44 meters in azimuth 23°18′ from the original station mark. The U. S. C. & G. S. station mark is a cross in the center of a triangle chiseled in a large rock. A cross surrounded by a circle chiseled in the rock is 13.87 meters in azimuth 329°37′ from the U. S. C. & G. S. station mark; and a cross surrounded by a circle chiseled in the rock is 5.30 meters in azimuth 73°50′ from the U. S. C. & G. S. station mark.

Davis (Washington, Whatcom County; E. C. Barnard, 1904; U. S. Coast and Geodetic Survey, 1926).—On the highest rocky mountain top 3 miles west of the Davis ranch on the Skagit River and about 22 miles up the river from Marblemount, Washington. It has heretofore been reached by a hard climb on foot from the Davis ranch.

Station mark: An aluminum disk marked "U. S. & C. B.", wedged in a drill hole in outcropping bedrock, with a 7-foot cairn built over it. The station was recovered in 1926 by the U. S. Coast and Geodetic Survey and used as a first-order triangulation station. They used the original station mark and set two reference marks: The first, a standard bronze-disk reference mark wedged in a drill hole in outcropping bedrock with the arrow pointing toward the station, is 17.898 meters in azimuth 183°31′ from the station; the second, a standard bronze-disk reference mark wedged in a drill hole in outcropping bedrock with the arrow pointing toward the station, is 6.511 meters in azimuth 63°30′ from the station.

Jackita (Washington, Whatcom County; U. S. Coast and Geodetic Survey, 1926).—On the highest point of the north-and-south ridge that forms the divide between the head of Devils Creek to the westward and the waters of Canyon Creek to the eastward. Canyon Creek is the north branch of Ruby Creek. These waters are all tributary from the east to the Skagit River. The station is 4 miles by trail from the Chancellor Power Plant.

Station mark: A standard U. S. C. & G. S. bronze-disk station mark wedged in a drill hole in a boulder. Reference mark No. 1 is a U. S. C. & G. S. standard bronze-disk reference mark wedged in a drill hole in outcropping bedrock, with the arrow pointing toward the station, in azimuth 2°50′23′′, 6.282 meters from the station. Reference mark No. 2 is a like mark set in the same manner in azimuth 134°53′07′′, 2.772 meters from the station.

Frosty (British Columbia, Yale District; E. C. Barnard, 1904; U. S. Coast and Geodetic Survey, 1926; International Boundary Commission, 1935).—On the eastern of two high points about 1 mile north of the International Boundary and about 1½ miles northeast of Monument 77. These two points are on the main watershed of the Cascade Mountains.

Station mark: An aluminum disk marked "U. S. & C. B.", set in a drill hole in solid rock, over which is a cairn.

Robinson (Washington, Okanogan County; E. C. Barnard, 1904; U. S. Coast and Geodetic Survey, 1925).—On the highest point of Robinson Mountain on the divide between the headwaters of the Pasayten River and the headwaters of the Methow River. The station is about 15 miles by road and trail northwest of Mazama, Washington, and about 4 miles southeast of Robinson Pass.

Station mark: An aluminum disk marked "U. S. & C. B." set in solid rock. In 1925 the U. S. Coast and Geodetic Survey set two reference marks as follows: A standard U. S. C. & G. S. bronze-disk reference mark, with the arrow pointing toward the station, wedged in a drill hole in a boulder, is 7.212 meters from the station in azimuth 216°07′; and a like mark set in the same manner is 6.282 meters from the station in azimuth 309°52′.

Sheep (Washington, Okanogan County; U. S. Coast and Geodetic Survey, 1925; International Boundary Commission, 1935).—On the highest point of Sheep, or Park, Mountain, about 1¾ miles south of the International Boundary and about 2¾ miles west of the Ashnola River. Sheep Mountain is a bare peak about 8,300 feet in elevation with heavy cliff faces to the east. It may be approached from U. S. Forest Service trails on the Ashnola River.

Station mark: A standard U. S. C. & G. S. bronze-disk station mark wedged in a drill hole in outcropping bedrock. A standard U. S. C. & G. S. bronze-disk reference mark, with the arrow pointing toward the station, is wedged in a drill hole in a boulder 15.925 meters from the station in azimuth 253°56′52″, and a like mark set in the same manner is 28.870 meters from the station in azimuth 357°04′41″.

Remmel (Washington, Okanogan County; E. C. Barnard, 1904; U. S. Coast and Geodetic Survey, 1925; International Boundary Commission, 1935).—About 5 miles south of the International Boundary and on the headwaters of the Methow River. The station is on the high, bald, rocky summit of Mount Remmel. It is best reached from Winthrop, Washington, from which point Forest Service roads and trails lead to the lookout house that has been erected by the Forest Service on the summit of the mountain.

Station mark: An aluminum disk marked "U. S. & C. B." set in solid rock. In 1925 the U. S. Coast and Geodetic Survey established a first-order triangulation station on the same summit and near the original station. The Coast and Geodetic Survey station mark is a standard U. S. C. & G. S. bronze-disk station mark wedged in a drill hole in outcropping bedrock. Reference mark No. 1, a standard bronze-disk reference mark with the arrow pointing toward the station, is wedged in a drill hole in a boulder 14.71 meters from the U. S. C. & G. S. station in azimuth 114°08′08′′. Reference mark No. 2 is a like mark set in the same manner 39.977 meters from the station in azimuth 242°59′28′′. The original station mark is 0.107 meter from the U. S. C. & G. S. station in azimuth 205°. The most northern corner of the lookout is in azimuth 242°33′ from the original station mark, distant about 2¾ meters. The most western corner is in azimuth 352°10′ from the station and about 2½ meters distant. The center of the lookout is in approximate azimuth 297°, 3¾ meters distant from the station.

Tiffany (Washington, Okanogan County; U. S. Geological Survey, 1900; E. C. Barnard, 1904; U. S. Coast and Geodetic Survey, 1925).—On the higher and more southern summit of Tiffany Mountain, a round, bare, double-topped mountain in the main range between the Methow and Okanogan Rivers. The station is about 22 miles northeast of Winthrop, Washington, about 20 miles southwest of Loomis, Washington, and about 12 miles northwest of Conconully, Washington. It may be conveniently approached from any of these places.

Station mark: A drill hole 6 inches deep in solid rock with an 8-foot cairn built over it. In 1925 the U. S. Coast and Geodetic Survey established a first-order triangulation station 2.890 meters from the original station in azimuth 88°03′. The U. S. C. & G. S. station mark is a standard bronze-disk station mark wedged in a drill hole in outcropping bedrock. A standard U. S. C. & G. S. bronze-disk reference mark, with the arrow pointing toward the station, is wedged in a drill hole in a boulder 9.321 meters from the U. S. C. & G. S. station in azimuth 311°14′42″. A like mark set in the same manner is 8.018 meters from the U. S. C. & G. S. station in azimuth 24°43′34″.

Chopaka (Washington, Okanogan County; E. C. Barnard, 1904; U. S. Coast and Geodetic Survey, 1925; International Boundary Commission, 1935).—On the highest peak of the big Chopaka Mountain, about 2½ miles south of the International Boundary, and about 3½ miles west of the Similkameen River. This peak is about 2 miles northwest of the peak that is locally known as Chopaka Mountain. The station is on the bald and rocky summit. It has heretofore been approached from Loomis, Washington, which is about 1,5 miles by road and trail to the southeast of the station.

Station mark: An aluminum disk marked "U. S. & C. B." set in the solid rock with a cairn built over it. In 1925 the U. S. Coast and Geodetic Survey established a first-order triangulation station on the same peak 3.89 meters, in azimuth 79°34′, from the original station mark. Their station mark is a standard U. S. C. & G. S. bronze-disk station mark wedged in a drill hole in outcropping bedrock. A standard U. S. C. & G. S. bronze-disk reference mark with the arrow pointing toward the station is wedged in a drill hole in outcropping bedrock 8.87 meters from the U. S. C. & G. S. station in azimuth 2°54′30′′.

Lemansky (Washington, Okanogan County; U. S. Geological Survey, 1900; E. C. Barnard, 1904; U. S. Coast and Geodetic Survey, 1925).—On the highest point on the ridge between the Okanogan River and Sinlahekin Creek, about 9 miles northwest of Tonasket, Washington, and about 5 miles south of Loomis, Washington. The peak on which the station is located is locally known as Aeneas Mountain. The mountain is bare except for some timber on the north side.

Station mark: A bronze disk cemented in solid rock with a 7-foot cairn built over it. In 1925 the U. S. Coast and Geodetic Survey set a new station mark described as follows: A standard U. S. C. & G. S. bronze-disk station mark wedged in a drill hole in outcropping bedrock, from which the original station mark is in azimuth 230°59′, and 9.275 meters distant. A standard U. S. C. & G. S. bronze-disk reference mark, with the arrow pointing toward the station, is wedged in a drill hole in outcropping bedrock 19.420 meters from the station mark in azimuth 206°19′18″. Another like reference mark set in the same manner is 10.909 meters from the station in azimuth 285°15′43″.

Oroville (Washington, Okanogan County; U. S. Coast and Geodetic Survey, 1925).—On the summit of a mountain about 6 miles southeast of Oroville, Washington, and about 1½ miles northwest of the highest point of Mount Hull. This mountain is not quite as high as Mount Hull; it is heavily timbered and lines of sight had to be cleared from the station. There is a small lake known as Black Diamond, or Summit, Lake about one-half mile to the southwest of the station and about 500 feet lower in elevation. The station is a little to the north of and a few feet lower than the summit of the mountain.

Station mark: A standard U. S. C. & G. S. bronze-disk station mark wedged in a drill hole in the outcropping bedrock. The two reference marks are U. S. C. & G. S. standard bronze-disk reference marks, with the arrows pointing toward the station, wedged in drill holes in the outcropping bedrock. Reference mark No. 1 is 14.954 meters from the station in azimuth 342°57′; reference mark No. 2 is 5.423 meters from the station in azimuth 54°08′.

Anarchist (British Columbia, Yale District; U. S. Coast and Geodetic Survey, 1925).—On the southernmost of two peaks of about the same elevation known as Anarchist Mountain, about 4 miles east of the Osoyoos (Canadian) customhouse and east of the north end of Osoyoos Lake. The station is about 150 feet south of the highest point of the mountain.

Station mark: A standard Geodetic Survey of Canada station mark set in a solid ledge with cement. The references are similarly marked. Reference mark No. 1 is 7.226 meters from the station in azimuth 205°12′46′′; reference mark No. 2 is 11.026 meters from the station in azimuth 338°15′39′′.

Osoyoos South Base (Washington, Okanogan County; U. S. Coast and Geodetic Survey, 1925; International Boundary Commission, 1930).—On the high bench about one mile northwest of Oroville, on the upper Osoyoos road. The station is about 150 meters west of, and about 100 feet higher than the road, and is about 90 meters east of the base of a high rugged bluff. It is on land owned by Mrs. Bartell, and is about midway between a young orchard and the main irrigation ditch.

Station mark: A standard U. S. C. & G. S. bronze-disk station mark set in the top of a square block of concrete. The two reference marks are standard U. S. C. & G. S. bronze-disk reference marks, with the arrows pointing toward the station, wedged in drill holes in boulders. Reference mark No. 1 is 85.737 meters from the station in azimuth 46°19′31″. Reference mark No. 2 is 40.939 meters from the station in azimuth 115°54′33″.

Osoyoos North Base (British Columbia, Yale District; U. S. Coast and Geodetic Survey, 1925; International Boundary Commission, 1930).—On the top of a prominent bare ridge about one-half mile southwest of the old Osoyoos customhouse and about 150 meters north of the Oroville-Osoyoos road where it turns east to cross the neck of the lake.

Station mark: Standard Geodetic Survey of Canada bronze-disk marks were used for the station and reference marks. Reference mark No. 1 is 35.024 meters from the station in azimuth 79°18′38″. Reference mark No. 2 is 42.480 meters from the station in azimuth 201°08′27″.

Gillespie (British Columbia, Yale District; C. H. Sinclair, 1905; U. S. Coast and Geodetic Survey, 1925; International Boundary Commission, 1930).—On the bald summit of a prominent hill 2.2 miles north of the International Boundary and about 1.5 miles west of Bridesville, British Columbia. The hill is sparsely timbered on the north side.

Station mark: The original station mark was replaced in 1925 with a standard Geodetic Survey of Canada bronze-disk station mark set in an outcropping ledge. The reference marks set at the same time are standard marks of the Geodetic Survey of Canada set in drill holes in outcropping rock. Reference mark No. 1 is 15.128 meters from the station in azimuth 193°13′. Reference mark No. 2 is 7.048 meters from the station in azimuth 292°01′.

Spur (Washington, Okanogan County; U. S. Coast and Geodetic Survey, 1925).—On the west end of a timbered ridge about 20 miles southeast of Oroville, Washington, about 5 miles northeast of the summit of Bonaparte Mountain, and about 2 miles northwest of Lost Lake. The station is about 30 meters north of and 6 feet lower than the highest point of the ridge. Lines of sight were cut through the timber to see other stations.

Station mark: A standard U. S. C. & G. S. bronze-disk station mark wedged in a drill hole in an outcropping ledge about one foot above the surface of the ground. The two reference marks are standard U. S. C. & G. S. bronze-disk reference marks, with the arrows pointing toward the station, wedged in drill holes in outcropping bedrock. Reference mark No. 1 is on the highest point of the ridge 29.787 meters from the station in azimuth 4°53′. Reference mark No. 2 is 11.920 meters from the station in azimuth 82°59′.

Bodie (Washington, Ferry County; U. S. Coast and Geodetic Survey, 1925).—In the Colville National Forest, about 14 miles north by west of Republic, Washington. The station is about 8 meters northwest of the Bodie lookout house of the U. S. Forest Service and near the northwest edge of the rimrock on the summit of the mountain. The mountain is wooded on the north side, open on the south side, and the summit is lightly wooded.

Station mark: A standard U. S. C. & G. S. bronze-disk station mark wedged in a drill hole in outcropping bedrock. Reference mark No. 1 is a standard U. S. C. & G. S. bronze-disk reference mark, with the arrow pointing toward the station, wedged in a drill hole in outcropping bedrock near the southeast side of the rimrock, and is 19.662 meters from the station in azimuth 288°10′02′′. Reference mark No. 2 is a like mark set in the same manner just southwest of the lookout house and is 12.596 meters from the station in azimuth 347°34′24′′. Triangulation station "Bodie U. S. G. S." is 2.448 meters in azimuth 45°28′ from the station.

Greenwood (British Columbia, Yale District; U. S. Coast and Geodetic Survey, 1925).—On the north end of the highest part of a mountain about 3 miles northwest of Greenwood, British Columbia. The summit of the mountain is partly bare and there are bare spots on the south side. There is a large square mineral-survey mark about 2 meters north of the station.

Station mark: A standard Geodetic Survey of Canada bronze-disk station mark set in a drill hole in a rock outcrop. The reference marks are standard Geodetic Survey of Canada reference marks set in drill holes in the outcropping rock. Reference mark No. 1 is 5.218 meters from the station in azimuth 195°13′. Reference mark No. 2 is 14.099 meters from the station in azimuth 329°00′.

Leona (Washington, Ferry County; U. S. Geological Survey; U. S. Coast and Geodetic Survey, 1925).— On Mount Leona in the Colville National Forest, about 8½ miles southeast of Malo, Washington. The station is on one of the highest points of the mountain. The mountain is heavily wooded on the north and sparingly on the south. Extensive clearing has been done around the station.

Station mark: The original station mark is a U. S. G. S. bronze disk set in a drill hole in the outeropping bedrock. The U. S. Coast and Geodetic Survey set a new station mark in 1925 about 8 inches southeast of the original station mark. The new station mark is a standard U. S. C. & G. S. bronze-disk station mark wedged in a drill hole in the outeropping bedrock. The two reference marks are standard U. S. C. & G. S. bronze-disk reference marks, with the arrows pointing toward the U. S. C. & G. S. station mark, wedged in drill holes in the outeropping bedrock. Reference mark No. 1 is 7.836 meters from the U. S. C. & G. S. station in azimuth 178°33′; reference mark No. 2 is 7.982 meters from the U. S. C. & G. S. station in azimuth 331°42′. The original station mark is 0.189 meter from the U. S. C. & G. S. station in azimuth 135°43′.

Christina (British Columbia, Yale District; U. S. Coast and Geodetic Survey, 1925).—On a high hill locally known as Baldy Mountain, about 10 miles by road and trail northeast of Grand Forks, British Columbia. It is about midway between Christina Lake and the North Fork of Kettle River. The station is on a very large rock outcrop but is surrounded by jack pines and therefore difficult to find. Considerable clearing has been done around the station.

Station mark: A standard Geodetic Survey of Canada station mark with two standard Geodetic Survey of Canada reference marks all set in rock outcrop. Reference mark No. 1 is 13.110 meters from the station in azimuth 246°04′20″; reference mark No. 2 is 10.582 meters from the station in azimuth 338°30′13″.

O'Toole (Washington, Stevens County; U. S. Coast and Geodetic Survey, 1925).—On the highest point of O'Toole Mountain, about 12 miles southwest of Northport, Washington, and about 2½ miles southeast of Marble, Washington.

Station mark: A standard U. S. C. & G. S. bronze-disk station mark wedged in a drill hole in outcropping bedrock. The two reference marks are standard U. S. C. & G. S. bronze-disk reference marks, with the arrows pointing toward the station, wedged in drill holes in the outcropping bedrock. Reference mark No. 1 is 4.384 meters from the station in azimuth 206°27′; reference mark No. 2 is 20.178 meters from the station in azimuth 152°43′.

Glory (British Columbia, Kootenay West District; U. S. Coast and Geodetic Survey, 1925).—On the highest point of Old Glory Mountain, about 13 miles by road and trail northwest of Rossland, British Columbia. Old Glory Mountain is easily recognized by its extreme height above the surrounding mountains and by its almost vertical slope on the north side.

Station mark: A standard Geodetic Survey of Canada bronze-disk station mark set in rock outcrop. There is said to be a reference mark set by the reconnaissance party, but it was not found by the observing party.

Kelly (British Columbia, Kootenay West District; U. S. Coast and Geodetic Survey, 1925; International Boundary Commission, 1934).—On the highest point, and near the north end, of the range of mountains lying north of the International Boundary and east of the Columbia River and known as the Gold Range. It is about 8½ miles by road and trail from Fruitvale, British Columbia. The summit of the mountain is mostly bare and grassy, but there are a few scrubby trees on it. This is not Kelly Mountain.

Station mark: A standard Geodetic Survey of Canada bronze-disk station mark set in solid rock outcrop. There are two standard Geodetic Survey of Canada reference marks set as follows: Reference mark No. 1 is 4.634 meters from the station in azimuth 134°38′; reference mark No. 2 is 12.173 meters from the station in azimuth 209°41′.

Hall (Washington, Pend Oreille County; U. S. Coast and Geodetic Survey, 1925).—On the highest point of Hall Mountain, about 10 miles southeast of Metaline Falls, Washington, about 10 miles northeast of Ione, Washington, and about 1½ miles east of Sullivan Lake. The mountain is wooded on all sides except an open spot on the south side running down from the top for about one-half mile. The station may be reached from either end of Sullivan Lake.

Station mark: A standard U. S. C. & G. S. bronze-disk station mark wedged in a drill hole in outcropping bedrock. The two reference marks are standard U. S. C. & G. S. bronze-disk reference marks, with the arrows pointing toward the station, wedged in drill holes in the outcropping bedrock. Reference mark No. 1 is 6.115 meters (slope measurement) from the station in azimuth 14°13′. Reference mark No. 2 is 28.135 meters (slope measurement) from the station in azimuth 105°08′.

Snowy (Idaho, Boundary County; U. S. Geological Survey; U. S. Coast and Geodetic Survey, 1925; International Boundary Commission, 1934).—In the extreme northwest corner of Idaho, about 35 miles by road and trail northeast of Metaline Falls, Washington. The station is on the highest point of the southern part of Snowy Top Mountain about one-half mile south of Monument 196 of the International Boundary.

Station mark: A standard U. S. G. S. bronze-disk station mark set in outcropping rock. Reference mark No. 1 is a standard U. S. C. & G. S. bronze-disk reference mark, with the arrow pointing toward the station, wedged in a drill hole in outcropping bedrock 13.483 meters (slope measurement) from the station in azimuth 313° 25′. Reference mark No. 2 is a like bronze disk set in the same manner 2.073 meters (slope measurement) from the station in azimuth 196°42′.

Summit (British Columbia, Kootenay West District; U. S. Coast and Geodetic Survey, 1925).—About 25 miles by road and trail northwest of Creston, British Columbia, and about 6 miles north and west of the forks of Summit Creek. The station is on the southernmost of two high peaks about one-half mile apart.

Station mark: A standard Geodetic Survey of Canada bronze-disk station mark wedged in a drill hole in outcropping bedrock. Reference mark No. 1 is a standard Geodetic Survey of Canada bronze-disk reference mark, with the arrow pointing toward the station, wedged in a drill hole in outcropping bedrock 7.328 meters from the station in azimuth 175°41′. Reference mark No. 2 is a like mark set in the same manner 11.726 meters from the station in azimuth 99°54′.

Parker (Idaho, Boundary County; U. S. Coast and Geodetic Survey, 1925).—About 16 miles by road and trail southwest of Porthill, Idaho, on the highest point of Parker Peak, between Parker and Canyon Creeks.

Station mark: A standard U. S. C. & G. S. bronze-disk station mark wedged in a drill hole in outcropping bedrock. Reference mark No. 1 is a standard U. S. C. & G. S. bronze-disk station mark, with the arrow pointing toward the station, set in a drill hole in a boulder 7.299 meters from the station in azimuth 176°16′54″. Reference mark No. 2 is a like bronze disk set in the same manner 9.898 meters from the station in azimuth 54°55′40″.

Kid (British Columbia, Kootenay East District; U. S. Coast and Geodetic Survey, 1925).—About 20 miles by trail northeast of Kitchener, British Columbia, on the southernmost high peak of the divide between Kid Creek and Goat River.

Station mark: A standard Geodetic Survey of Canada bronze-disk station mark wedged in a drill hole in outcropping bedrock. Reference mark No. 1 is a standard Geodetic Survey of Canada bronze-disk reference mark, with the arrow pointing toward the station, wedged in a drill hole in bedrock 14.209 meters from the station in azimuth 357°18′. Reference mark No. 2 is a like bronze disk set in the same manner 5.846 meters from the station in azimuth 57°10′.

Ewing (Montana, Lincoln County; U. S. Geological Survey; International Boundary Commission, 1903; U. S. Coast and Geodetic Survey, 1925).—On the summit of a mountain about 5 miles south of the International Boundary and about 3 miles east of the Montana-Idaho line. It is about 15 miles by trail northeast of the U. S. Forest Service ranger station "Snyder" which is on the old Bonners Ferry-Eastport highway.

Station mark: A copper bolt set in a loose rock with a cairn built over it. In 1925 the U. S. Coast and Geodetic Survey recovered the station and set a new station mark, a standard U. S. C. & G. S. bronze-disk station mark wedged in a drill hole in outcropping bedrock. Two reference marks were established; both are crosses cut in loose rocks. Reference mark No. 1 is 5.640 meters from the new station in azimuth 299°14′. Reference mark No. 2 is 9.132 meters from the new station in azimuth 77°26′. The original station mark is 5.62 meters from the new station in azimuth 86°57′15′′.

Moyie (British Columbia, Kootenay East District; U. S. Coast and Geodetic Survey, 1925).—At the Moyie lookout station of the British Columbia Forest Service, about 8 miles by road and trail from the town of Moyie, British Columbia.

Station mark: A standard Geodetic Survey of Canada bronze-disk station mark wedged in a drill hole in outcropping bedrock. The two reference marks are standard Geodetic Survey of Canada bronze-disk reference marks wedged in drill holes in outcropping bedrock. Reference mark No. 1 is 19.207 meters from the station in azimuth 206°07′. Reference mark No. 2 is 10.510 meters from the station in azimuth 114°16′. The southeast corner of the lookout cabin is 12.60 meters from the station in azimuth 151°53′.

Yaak (Montana, Lincoln County; U. S. Geological Survey; International Boundary Commission, 1903; U. S. Coast and Geodetic Survey, 1925; 1934).—On the highest point of Yaak, or Robinson, Mountain in the Purcell Range, about 2¼ miles south of the International Boundary and about 11½ miles west of Gateway, Montana. The station is best reached from the Dodge Creek and Yaak River road from Rexford, Montana, to Bonners Ferry, Idaho.

Station mark: A standard U. S. G. S. bronze-disk station mark set in a rock 8 by 24 by 24 inches in size and firmly planted in the ground. A drill hole in rock, marking the eccentric station occupied in 1934, is 4.91 meters from the station in azimuth 178° 17′. In 1925 the U. S. Coast and Geodetic Survey recovered the station and established a new station within about a foot of the original station. The new station mark is a standard U. S. C. & G. S. bronze-disk station mark wedged in a drill hole in outcropping bedrock. Two standard U. S. C. & G. S. bronze-disk reference marks, with the arrows pointing toward the station, are wedged in drill holes in outcropping bedrock. Reference mark No. 1 is 15.257 meters from the U. S. C. & G. S. station in azimuth 265°18′. Reference mark No. 2 is 4.850 meters from the U. S. C. & G. S. station in azimuth 62°22′. The original station mark is 0.388 meter from the station in azimuth 267°03′. A U. S. Forest Service lookout house stands a few feet to the east of the station marks.

Broadwood (British Columbia, Kootenay East District; U. S. Coast and Geodetic Survey, 1925).—On the highest peak of the mountain locally known as "Baldy", about 6 miles southeast of Elko, British Columbia. Station mark: A standard Geodetic Survey of Canada bronze-disk station mark wedged in a drill hole in outcropping bedrock. The two reference marks are standard Geodetic Survey of Canada bronze-disk reference marks wedged in drill holes in outcropping bedrock. Reference mark No. 1 is 4.948 meters from the station in azimuth 68°28′. Reference mark No. 2 is 13.950 meters from the station in azimuth 35°43′.

Green (Montana, Lincoln County; C. H. Sinclair, 1903; U. S. Coast and Geodetic Survey, 1925).—On the highest point of Green Mountain, a bare peak on the crest of the Galton Range, about 2.6 miles south of the International Boundary and about 8 miles northeast of Eureka, Montana. The Phillipps Creek-Wigwam River trail crosses the ridge in the saddle to the north of the station.

Station mark: The original station mark was a drill hole in a stone set in the shale rock. In 1925 the U. S. Coast and Geodetic Survey recovered the station and buried the original stone for a subsurface mark and placed a standard U. S. C. & G. S. bronze-disk station mark in a drill hole in a stone block 9 by 24 by 28 inches for a surface mark. They set two standard U. S. C. & G. S. bronze-disk reference marks, with the arrows pointing toward the station, one in rock outcrop, and one in a stone block 10 by 10 by 16 inches, but did not record the distances and directions.

Frost (British Columbia, Kootenay East District; C. H. Sinclair, 1903; U. S. Coast and Geodetic Survey, 1925; International Boundary Commission, 1932).—On a rounding, grassy hill on the east side of the Kootenay River, about one-half mile east of the town of Flagstone, British Columbia.

Station mark: A drill hole in the top of a granite post, 6 by 6 by 48 inches, the upper 6 inches dressed. The post is set in the ground to the depth of 40 inches leaving 8 inches projecting above the ground. The letters "U. S. C. B." are cut in the corners of the top of the post. In 1925 the U. S. Coast and Geodetic Survey recovered the station and placed a subsurface mark under the original granite post. The subsurface mark is a Geodetic Survey of Canada standard bronze-disk station mark set in a block of concrete 3 feet below the surface of the ground. When the granite post was replaced, a Geodetic Survey of Canada standard bronze-disk station mark was placed in the drill hole in the top of it for the surface mark. A Geodetic Survey of Canada standard bronze-disk reference mark was then set in an irregular mass of concrete 37.21 meters from the station in azimuth 142°50′.

Campbell (Montana, Lincoln County; C. H. Sinclair, 1903; U. S. Coast and Geodetic Survey, 1925; International Boundary Commission, 1934).—About 3 miles south of Gateway, Montana, on the east side of the Kootenai River and about three-fourths mile east of the Gateway-Eureka road. The station is on the north end of a sparsely wooded ridge that rises about 100 feet above the valley. It is about 125 meters north of the north fence line of the Clough ranch, which crosses the ridge near its crest.

Station mark: A drill hole in the top of a granite post, 6 by 6 by 48 inches, the upper 6 inches dressed. The post is set in the ground to a depth of 40 inches, leaving 8 inches projecting above the surface. The letters "U. S. C. B." are cut in the corners of the top of the post. In 1925 the U. S. Coast and Geodetic Survey set one of their standard bronze-disk station marks in the drill hole in the top of the post and set one of their standard bronze-disk reference marks, with the arrow pointing toward the station, in a square block of concrete 90.70 meters from the station in azimuth 358°36′33′′.

Tuchuck (Montana, Flathead County; U. S. Geological Survey; International Boundary Commission, 1903; U. S. Coast and Geodetic Survey, 1925; 1933).—On the highest point of Tuchuck Mountain, a high, pyramidal, bare peak about 9 miles west of the Flathead River and about 1¾ miles south of the International Boundary.

Station mark: A standard U. S. G. S. bronze-disk station mark set in a green schist rock. The U. S. Coast and Geodetic Survey recovered the station in 1925 and re-marked the point by using the original disk and stone for a subsurface mark and placing a standard U. S. C. & G. S. bronze-disk station mark in a large block of stone above it. Two reference marks were set in rock outcrop but no other record of them is given. All three of the marks were stamped "Tuchuch" by mistake instead of "Tuchuck."

Scarpe (British Columbia, Kootenay East District; Alberta, MacLeod District; U. S. Coast and Geodetic Survey, 1924).—On the Continental Divide, on the highest point of the south peak of Scarpe Mountain. The station is about midway between the headwaters of Commerce and Pass Creeks, both tributary to the Flathead River.

Station mark: A standard U. S. C. & G. S. bronze-disk station mark set in a drill hole in an outcropping boulder. Two like marks set in a similar manner were set for references. Reference mark No. 1 is 10.85 meters from the station in azimuth 218°08′. Reference mark No. 2 is 8.42 meters from the station in azimuth 53°43′.

Sunkist (British Columbia, Kootenay East District; U. S. Coast and Geodetic Survey, 1924).—On the high peak at the south end of the Sunkist Ridge about 3 miles south of Sunkist Peak and about 11 miles north of the International Boundary. The station peak rises very abruptly from the north side of Sage Creek at a point about 2 miles downstream from the mouth of Sunkist Brook. The station is about 6 meters down the southeast side from the top of the mountain.

Station mark: A standard U. S. C. & G. S. bronze-disk station mark wedged in a drill hole in an outeropping boulder. A like mark is set in the same manner for a reference mark, 7.53 meters from the station in azimuth 154°00′.

Carter (Montana, Flathead County; U. S. Coast and Geodetic Survey, 1924).—On the highest point of Mount Carter in Glacier National Park. The station is about 1 mile southeast of the head of Bowman Lake. It is a 5,800-foot climb from the head of the lake to the station.

Station mark: A standard U. S. C. & G. S. bronze-disk station mark wedged in a drill hole in a boulder. A standard U. S. C. & G. S. bronze-disk reference mark, with the arrow pointing toward the station, is wedged in a drill hole in an outcropping boulder 5.214 meters from the station in azimuth 76°16′.

Dungarvan (Alberta, MacLeod District; U. S. Coast and Geodetic Survey, 1924).—On the highest point of Mount Dungarvan, in Waterton Lakes Park, about 7 miles northwest of Waterton Lakes Park hotel and office. Mount Dungarvan is the highest peak in the vicinity and lies between the headwaters of Dungarvan Creek to the north and a tributary of Blakiston Brook to the south.

Station mark: A standard U. S. C. & G. S. bronze-disk station mark wedged in a drill hole in a large flat boulder. The two reference marks are standard U. S. C. & G. S. bronze-disk station marks wedged in drill holes in boulders. Reference mark No. 1 is 5.812 meters from the station in azimuth 199°59′. Reference mark No. 2 is 6.828 meters from the station in azimuth 253°50′.

Crossley (Montana, Glacier County; U. S. Coast and Geodetic Survey, 1924).—On a sharp peak on the Crossley ridge in Glacier National Park. This ridge lies to the east of Glenns Lake. The station is about one-half mile northeast of Mount Merritt and on the same ridge.

Station mark: A standard U. S. C. & G. S. bronze-disk station mark wedged in a drill hole in a boulder. The two reference marks are standard U. S. C. & G. S. bronze-disk reference marks, with the arrows pointing toward the station, wedged in drill holes in boulders. Reference mark No. 1 is 14.025 meters from the station in azimuth 6°01′. Reference monument No. 2 is 20.540 meters from the station in azimuth 186°27′.

Beazer (Alberta, Lethbridge District; U. S. Coast and Geodetic Survey, 1923).—On the southwestern of two prominent knolls, about 8 miles west and 8 miles south of Cardston, Alberta, about 1½ miles south-by-east of Beazer post office, Alberta, and in the southeast corner of NW4 sec. 6, T. 2, R. 26 W., fourth meridian. The northeastern of the two knolls is a few feet lower and its top is covered with small pine trees; while the southwestern one, on which the station is situated, has only a few trees on its west slope and its top is rounding and grassy. These knolls are about 250 meters apart on the same hill, the only high hill in the vicinity with trees on its top.

Station mark: The subsurface mark is a standard Geodetic Survey of Canada bronze-disk station mark set in a concrete block, 12 by 12 by 9 inches, set 27 inches below the surface of the ground. The surface mark is a like bronze disk set in a concrete block 16 by 16 inches square at the top, 24 by 24 inches square at the bottom, 28 inches in depth, and projecting about 4 inches above the surface of the ground. A standard Geodetic Survey of Canada bronze-disk reference mark set in a concrete block similar to the surface mark is 77.70 meters from the station in azimuth 340°16′54′′.

Cracker (Montana, Glacier County; U. S. Coast and Geodetic Survey, 1924).—In Glacier National Park on the highest point of the ridge that lies to the south and east of Cracker Lake. The station is about one mile south of Cracker Lake and about one-half mile southwest of Mount Siyeh, which is on the same ridge but separated from the station peak by a very deep saddle.

Station mark: A standard U. S. C. & G. S. bronze-disk station mark wedged in a drill hole in a large, flat boulder.

Divide (Montana, Glacier County; U. S. Coast and Geodetic Survey, 1923).—On the Hudson Bay Divide, between the waters of St. Mary River on the west and Milk River on the east. The station is about 3 miles east and 3 miles south of Babb post office, Montana, and about 2 miles east of Lower St. Mary Lake. It is about 200 meters northeast of an old wagon road crossing the ridge in a northwesterly direction, and about one-third mile north of the edge of the dense, small timber that covers the southern portion of the ridge. There are patches of fir timber on the west slope near the station and clumps of fir and quaking asp on the east side. The station can be reached from the Browning-Babb stage road by following it to the Percival ranch and there taking an old road leading up the ridge to the west.

Station mark: A standard U. S. C. & G. S. bronze-disk station mark set in the top of a concrete block 16 by 16 inches square at the top, 24 by 24 inches square at the bottom, 28 inches in depth, and projecting 4 inches above the surface of the ground. The subsurface mark is a like bronze disk set in a block of concrete 12 by 12 by 9 inches in size, placed 27 inches below the surface of the ground.

Mussetter (Montana, Glacier County; U. S. Coast and Geodetic Survey, 1923).—On a low, though prominent, flat-topped butte 2 miles north and 5 miles west of the Buck ranch on the South Fork of Milk River. It is about 2 miles west of the road leading northwest from the Buck ranch to the mouth of the U. S. Reclamation Service canal. Truck or wagon can be driven cross country to the station from nearly all directions.

Station mark: The surface mark is a standard U. S. C. & G. S. bronze-disk reference mark on which the word "reference" has been cut out and the word "triangulation" substituted; a small triangle has been cut around the center. The disk is set in the top of a concrete block 16 by 16 inches square at the top, 24 by 24 inches square at the bottom, and 28 inches deep, projecting 4 inches above the surface of the ground. The subsurface mark is a standard U. S. C. & G. S. bronze-disk reference mark, stamped "SUB-SURF", set in a concrete block, 12 by 12 by 10 inches in size, set 27 inches under the ground. Triangulation station "Lincoln", marked by a standard U. S. Geological Survey bench-mark post, is 3.41 meters from the station in azimuth 60°19′53″. Station "G. L. O. No. 52" is about 200 meters southwest of the station.

Ross (Alberta, Lethbridge District; U. S. Coast and Geodetic Survey, 1923).—About 17 miles south and 2 miles west of Magrath, Alberta, and one mile north of Ross Lake. The station is in NW¼ sec. 32, T. 2, R. 22 W., fourth meridian. It is in a pasture, on the highest knoll in the vicinity, and 365 meters southwest of a fence line.

Station mark: A standard Geodetic Survey of Canada bronze-disk station mark set in the top of a concrete block 16 inches square at the top, 24 inches square at the bottom, 28 inches deep, and projecting 4 inches above the ground. The subsurface mark is a like disk set in a concrete block 12 by 12 by 9 inches in size, placed 27 inches under the surface of the ground. A standard Geodetic Survey of Canada bronze-disk reference mark set in a boulder surrounded by concrete is 364.39 meters from the station in azimuth 38°45′20″.

Landslide (Montana, Glacier County; U. S. Geological Survey; U. S. Coast and Geodetic Survey, 1923).—On a prominent hill known as Landslide Butte, the highest hill in the vicinity, identified by the landslide at its west end. The station is about 5 miles northeast of Buffalo Lake and is near the center of NW¼ sec. 3, T. 36 N., R. 8 W., principal meridian. It may be reached by taking the Cut Bank-Milk River road from Cut Bank, Montana. This road passes near the butte at a distance of about 30 miles from Cut Bank.

Station mark: The U. S. G. S. mark is a standard iron post with a bronze cap of that survey. The U. S. C. & G. S. mark is a standard U. S. C. & G. S. bronze-disk station mark set in a concrete block 16 by 16 inches square at the top, 24 by 24 inches at the bottom, 28 inches deep, and projecting 4 inches above the surface of the ground. The subsurface mark is a like bronze disk set in a concrete block 12 by 12 by 9 inches in size and set 27 inches below the surface of the ground. The azimuth and distance between the two stations are not given.

Ridge (Montana, Glacier County; C. H. Sinclair, 1910; U. S. Coast and Geodetic Survey, 1923).—About 7 miles north and 2½ miles east of the Buck ranch on the South Fork of Milk River, 1¼ miles south of International Boundary Monument 305, and in sec. 11, T. 37 N., R. 10 W., principal meridian. The station is on the south end of the first ridge south of a prominent rounding knoll having a pile of rocks on its top. It is three-fourths mile south of the knoll.

Station mark: The original station mark is an International Boundary Commission bronze-disk station mark set in concrete with a cairn built over it. The U. S. C. & G. S. mark is their standard bronze-disk station mark set in a concrete block 16 inches square at the top, 24 inches square at the bottom, 28 inches deep, and projecting 4 inches above the ground. The U. S. C. & G. S. subsurface mark is a like bronze disk set in a concrete block 12 by 12 by 9 inches in size and placed 27 inches underground. The original station mark is 3.735 meters from the U. S. C. & G. S. station in azimuth 356°10′59″.

Boundary West Base (Alberta, Lethbridge District; U. S. Coast and Geodetic Survey, 1923).—On the crest of the ridge that crosses the International Boundary between Monuments 303 and 304. The station is a few feet north of the boundary line, in the Candian road allowance and near the northeast corner of sec. 5, T. 37 N., R. 10 W., principal meridian, United States Land Office surveys. It is about three-fourths mile west of Monument 304.

Station mark: The subsurface mark is a standard U. S. C. & G. S. bronze-disk station mark set in a concrete block 12 by 12 by 9 inches, placed 27 inches underground. The surface mark is a like bronze disk set in the top of a concrete block 16 by 16 inches square at the top, 24 by 24 inches square at the bottom, and 28 inches in depth, projecting about 4 inches above the surface of the ground. Monument 304 is 1,448.2 meters from the station in azimuth 269°58′18″. Level bench mark No. 55, an iron pipe with cap inscribed "B. M.", is 44.96 meters from the station in azimuth 125°54′47″.

Boundary East Base (Alberta, Lethbridge District; U. S. Coast and Geodetic Survey, 1923).—On a plateau' about one-fourth mile east of International Boundary Monument 309 and about 6 meters north of the boundary line, in the Canadian road allowance. The station is near the edge of the plateau where the terrain slopes steeply to the southeast to the valley of the South Fork of Milk River. The base was measured westward from this point parallel to the boundary.

Station mark: The subsurface mark is a standard U. S. C. & G. S. bronze-disk station mark set in a block of concrete, 12 by 12 by 9 inches, placed 27 inches below the surface of the ground. The surface mark is a like bronze disk set in the top of a square concrete block, 16 by 16 inches at the top, 24 by 24 inches at the bottom, and 28 inches in depth, placed so that it projects about 4 inches above the ground. There are no reference marks.

Meeks (Alberta, Lethbridge District; U. S. Coast and Geodetic Survey, 1923).—About 13 miles west and 4 miles north of Milk River, Alberta, and on the south side of the highest range of hills to the north of Milk River. The station is in the Meeks pasture to the west of the Rollen lease and is estimated to be in SE¼ sec. 17 or SW¼ sec. 16, T. 3, R. 18 W., fourth meridian.

Station mark: A standard Geodetic Survey of Canada bronze-disk station mark set in the top of a concrete block 16 inches square at the top, 24 inches square at the bottom, 28 inches deep, and projecting 4 inches above the ground. The subsurface mark is a like bronze disk set in a concrete block 12 by 12 by 9 inches in size, 27 inches underground.

Senior (Alberta, Lethbridge District; U. S. Coast and Geodetic Surevy, 1923).—About 12 miles west and 5 miles north of Sweetgrass, Montana, 5 miles south and 7 miles west of Milk River, Alberta, in the southwest corner of the SE¼ sec. 32, T. 1, R. 17 W., fourth meridian, and about 200 meters northeast of the quarter-section corner on the south line of the section. The station is on the highest point of the northeast knoll of the high range of hills lying between Milk River on the north and the International Boundary on the south.

Station mark: A standard Geodetic Survey of Canada bronze-disk station mark set in the top of a concrete block 16 inches square at the top, 24 inches square at the bottom, 28 inches deep, and projecting 4 inches above the surface of the ground. The subsurface mark is a like disk set in a concrete block 12 by 12 by 9 inches in size and placed 27 inches underground. Reference mark No. 1 is a standard Geodetic Survey of Canada bronze-disk

reference mark set in the top of a concrete block 14 inches square at the top, 26 inches deep, projecting 4 inches above the ground, and in a fence line, 61.98 meters from the station in azimuth 343°45′14″. Reference mark No. 2 is a like bronze disk set in an outcropping boulder, 151.24 meters from the station in azimuth 118°27′56″.

McCormick (Montana, Toole County; U. S. Coast and Geodetic Survey, 1923).—About 10 miles south and 8 miles west of Sweetgrass, Montana, about 7 miles north and 7 miles west of Kevin, Montana, and 1½ miles south and 1½ miles east of Demers post office at Fitzpatric Lake. The station is in SE½ sec. 21, T. 36 N., R. 4 W., principal meridian, and is about 100 meters north of the south line of the section. It is 16 meters northeast of Mrs. Martha McCormick's house, 14 meters southeast of a drilled well, and is on the highest point of land in the vicinity.

Station mark: A standard U. S. C. & G. S. bronze-disk station mark set in the top of a concrete block 16 inches square at the top, 24 inches square at the bottom, and 28 inches in depth, the upper 4 inches projecting above the ground. The subsurface mark is a like bronze disk set in a concrete block 12 by 12 by 9 inches in size and placed 27 inches underground. A standard U. S. C. & G. S. bronze-disk reference mark, with the arrow pointing toward the station, is set in the top of a concrete block similar to that of the station mark, but 14 inches square at the top and 26 inches deep, and projecting 4 inches above the ground. The reference mark is 107.56 meters from the station in azimuth 8°20′13″. The northeast corner of the concrete foundation of Mrs. McCormick's house is 16.65 meters from the station in azimuth 41°16′30″. The center of the drilled well casing is 15.10 meters from the station in azimuth 121°59′36″.

Verdigris (Alberta, Lethbridge District; U. S. Coast and Geodetic Survey, 1923).—About 2½ miles east and three-fourths mile north of Milk River, Alberta. The station is in NW¼ sec. 25, T. 2, R. 16 W., fourth meridian, and is about 450 meters east of the northwest corner of the section and about 50 meters south of the wire fence on the north line of the section. It is in a cultivated field on the divide between Milk River on the south and Verdigris Lake on the north and is on the highest ground in the vicinity.

Station mark: A standard Geodetic Survey of Canada bronze-disk station mark set in the top of a concrete block 16 inches square at the top, 24 inches square at the bottom, 28 inches deep, and projecting 4 inches above the ground. The subsurface mark is a like bronze disk set in a concrete block 12 by 12 by 9 inches in size and placed 27 inches underground. A standard Geodetic Survey of Canada bronze-disk reference mark is set in a concrete block 14 inches square at the top, 26 inches deep, and projecting 3 inches above the surface of the ground. It is 45.35 meters from the station in azimuth 163°28′54″.

West Butte (Montana, Toole County; U. S. Coast and Geodetic Survey, 1923).—On the highest point of West Butte, one of the Sweetgrass Hills. It is about 4½ miles south of the International Boundary and is about 1½ miles northeast of West Butte post office, Montana. A bronze disk, unmarked, cemented in a boulder embedded in the ground was found on the summit of the butte. No record of what this mark was for has been found. It is now used as a reference mark.

Station mark: A standard U. S. C. & G. S. bronze-disk station mark set in concrete in a depression in a boulder. The subsurface mark is a like bronze disk set in concrete in a depression in a boulder 3 feet underground. Reference mark No. 1 is a standard U. S. C. & G. S. bronze-disk reference mark, with the arrow pointing toward the station, set in concrete in a depression in a boulder, 14.97 meters from the station in azimuth 147°40′37″. Reference mark No. 2 is the bronze disk that was found on the station site; it is 7.986 meters from the station in azimuth 334°06′18″.

Kippen (Alberta, Lethbridge District; U. S. Coast and Geodetic Survey, 1923).—About 36 miles by road northeast of Sweetgrass, Montana, about 5 miles by road northeast of the Kippen post office, and about 2 miles south and one-half mile east of the Lucky Strike post office. It is on the highest point in the vicinity. The station is in NW¼ sec. 7, T. 3, R. 11 W., fourth meridian, and is approximately 290 meters south of the north section line and 550 meters east of the west section line.

Station mark: A standard U. S. C. & G. S. bronze-disk station mark set in a square block of concrete. The subsurface mark is a like bronze disk set in a block of concrete 3 feet underground. Reference mark No. 1 is a standard U. S. C. & G. S. bronze-disk reference mark, with the arrow pointing toward the station, set in a square block of concrete 288.02 meters from the station in azimuth 134°34′15″. Reference mark No. 2 is a like bronze disk set in a similar manner 553.48 meters from the station in azimuth 167°18′34″.

Hill (Montana, Liberty County; U. S. Coast and Geodetic Survey, 1923).—On the top of the most northeastern of the Sweetgrass Hills. This mountain culminates in a double peak, the two points being nearly north and south of each other and about 1.4 miles apart. The station is on the southern and slightly lower of the two peaks. Station "Sweetgrass" is on the northern and higher peak.

Station mark: The station mark is not recorded but is probably a standard U. S. C. & G. S. bronze-disk station mark set in rock.

Antelope (Alberta, Medicine Hat District; U. S. Coast and Geodetic Survey, 1923).—On the highest point of a ridge extending in a northwesterly and southeasterly direction about 6 miles north and one-half mile west

of Monument 366 of the International Boundary. The station is in the south half of SE¼ sec. 1, T. 2, R. 8 W., fourth meridian, and is about 400 meters northwest of the southeast corner of the section.

Station mark: A standard bronze-disk station mark set in the top of a square post of concrete. The subsurface mark is a like bronze disk set in a block of concrete 3 feet underground. The reference mark is a standard bronze-disk reference mark, with the arrow pointing toward the station, set in the top of a square post of concrete 413.09 meters from the station in azimuth 305°20′34″. The reference mark is at the southeast corner of the section

Pinhorn (Alberta, Medicine Hat District; U. S. Coast and Geodetic Survey, 1923).—About one-half mile north of Monument 367 of the International Boundary, and about 3¼ miles east and one-half mile north of the Pinhorn customhouse. It is near the center of sec. 6, T. 1, R. 7 W., fourth meridian. The station is on a small knoll which is the highest ground in the vicinity.

Station mark: A standard Geodetic Survey of Canada bronze-disk station mark set in a square block of concrete 16 by 16 by 38 inches. The subsurface mark is a like bronze disk set in a concrete block 10 by 10 by 10

inches, 3 feet underground. There are no reference marks.

Milk (Alberta, Medicine Hat District; U. S. Coast and Geodetic Survey, 1923).—Nearly due north of Joplin, Montana, and about 5 miles north and 1 mile east of Monument 371 of the International Boundary. It is near the middle of the south side of sec. 28, T. 1, R. 6 W., fourth meridian. The station is on the highest point of a conical hill, the highest in the vicinity.

Station mark: A standard Geodetic Survey of Canada bronze-disk station mark set in a square block of concrete. The subsurface mark is a like bronze disk set in a square block of concrete 3 feet underground. Reference mark No. 1 is a standard Geodetic Survey of Canada bronze-disk reference mark with the arrow pointing toward the station set in a square block of concrete 104.84 meters from the station in azimuth 233°15′50″. Reference mark No. 2 is a like mark set in a similar manner 135.77 meters from the station in azimuth 15°11′02″.

New (Montana, Liberty County; U. S. Coast and Geodetic Survey, 1923).—About 28 miles due north of Joplin, Montana, about 3 miles south of the International Boundary, 2½ miles northeast of a white schoolhouse, and about one-fourth mile southeast of a large oil derrick. It is on top of a flat ridge and is on the north line of sec. 14, T. 37 N., R. 7 W., principal meridian, and is not far from the quarter corner.

Station mark: A standard U. S. C. & G. S. bronze-disk station mark set in a square block of concrete. The subsurface mark is a like bronze disk set in a square block of concrete 3 feet underground. Reference mark No. 1 is a standard U. S. C. & G. S. bronze-disk reference mark, with the arrow pointing toward the station, set in a square block of concrete 43.11 meters from the station in azimuth 270°05′10′′. Reference mark No. 2 is a like bronze disk, wedged in a drill hole in a boulder, 42.90 meters from the station in azimuth 90°19′38′′.

Joplin (Montana, Liberty County; U. S. Coast and Geodetic Survey, 1923).—About 2 miles north and 1½ miles east of Joplin, Montana, on a small knoll on the highest point of a high prominent ridge, and about 150 meters northwest of the point where a good road crosses the ridge. It is near the northwest corner of SE¼ sec. 30, T. 33 N., R. 8 E., principal meridian.

Station mark: A standard U. S. C. & G. S. bronze-disk station mark set in a square block of concrete. The subsurface mark is a like bronze disk set in a block of concrete 3 feet underground. Reference mark No. 1 is a standard U. S. C. & G. S. bronze-disk reference mark, with the arrow pointing toward the station, wedged in a drill hole in an outcropping boulder 151.45 meters from the station in azimuth 66°04′19′′. Reference mark No. 2 is a like bronze disk set in a similar manner 107.70 meters from the station in azimuth 125°04′14′′.

Goldstone (Montana, Hill County; U. S. Coast and Geodetic Survey, 1923).—About 21 miles north and 3 miles east of Rudyard, Montana, and about 8 miles south of the International Boundary. It is 1¼ miles east of the old Gold Stone post office and store, and is on the highest point of a large flat-topped ridge. The station is in the northeast corner of NW¼ sec. 13, T. 36 N., R. 9 E., principal meridian.

Station mark: A standard U. S. C. & G. S. bronze-disk station mark set in a square block of concrete. The subsurface mark is a like bronze disk wedged in a drill hole in a boulder set 3 feet underground. Reference mark No. 1 is a standard U. S. C. & G. S. bronze-disk reference mark, with the arrow pointing toward the station, wedged in a drill hole in a boulder 332.63 meters from the station in azimuth 179°04′15″. Reference mark No. 2 is a like mark set in a square block of concrete at an unrecorded distance from the station in azimuth 267°05′14″.

Sage (Alberta, Medicine Hat District; U. S. Coast and Geodetic Survey, 1923).—On the highest point of a prominent flat-topped ridge about 27 miles west and 5 miles south of Govanlock, Saskatchewan, about 6 miles northeast of Onefour, Alberta, and about 10 miles north of the International Boundary. The station is about 25 meters north of a road which leads to an open coal vein.

Station mark: A standard U. S. C. & G. S. bronze-disk station mark set in a square block of concrete. The subsurface mark is a like bronze disk set in a square block of concrete 3 feet underground. Reference mark No. 1 is a standard Geodetic Survey of Canada bronze-disk reference mark, with the arrow pointing toward the station, set in a square block of concrete 103.39 meters from the station in azimuth 341°58′20″. Reference mark No. 2 is a like mark set in the same manner 395.38 meters from the station in azimuth 83°24′33″.

Govanlock (Saskatchewan, Maple Creek District; U. S. Coast and Geodetic Survey, 1923).—About 8 miles north of the International Boundary and about one-half mile east of the fourth principal meridian. It is about 6 miles south and 7½ miles west of Govanlock, Saskatchewan, and is on a small but prominent hill, the highest point in the vicinity, which is plainly visible to the southwest from Govanlock.

Station mark: A standard Geodetic Survey of Canada bronze-disk station mark set in a square block of concrete. The subsurface mark is a like bronze disk set in a block of concrete 3 feet underground. Reference mark No. 1 is a standard Geodetic Survey of Canada bronze-disk reference mark, with the arrow pointing toward the station, set in a square block of concrete 23.17 meters from the station in azimuth 223°02′14′′. Reference mark No. 2 is a like bronze disk set in a similar manner 20.33 meters from the station in azimuth 308°38′26′′.

Simpson (Montana, Hill County; U. S. Coast and Geodetic Survey, 1923).—About 23 miles north and 12 miles west of Havre, Montana, in NE¼ sec. 18, T. 36 N., R. 14 E., principal meridian. The station is on the highest point and near the northern extremity of a high and prominent ridge which runs in a northwesterly and southeasterly direction. The east line of the section is about 200 meters east of the station.

Station mark: A standard U. S. C. & G. S. bronze-disk station mark set in a square block of concrete. The subsurface mark is a like bronze disk set in a square block of concrete 3 feet underground. Reference mark No. 1 is a standard U. S. C. & G. S. bronze-disk station mark, with the arrow pointing toward the station, set in a square block of concrete 32.68 meters from the station in azimuth 242°02′17″. Reference mark No. 2 is a like bronze disk set in the same manner 33.80 meters from the station in azimuth 116°15′10″.

Signal (Montana, Hill County; U. S. Coast and Geodetic Survey, 1923).—About 27 miles north and 6 miles west of Havre, Montana, and about 4 miles south of the International Boundary. It is on the highest point of Signal Butte near the northwest end of the ridge and is near the middle of the south side of sec. 20, T. 37 N., R. 15 E., principal meridian. An oil derrick and some newly constructed buildings stand about one-fourth mile to the westward of the station.

Station mark: A standard U. S. C. & G. S. bronze-disk station mark wedged in a drill hole in a boulder. The subsurface mark is a standard U. S. C. & G. S. bronze-disk station mark wedged in a drill hole in a boulder placed 3 feet underground. Reference mark No. 1 is a standard U. S. C. & G. S. bronze-disk reference mark, with the arrow pointing toward the station, wedged in a drill hole in a boulder 28.02 meters from the station in azimuth 257°47′36″. Reference mark No. 2 is a like mark set in a similar manner 32.92 meters from the station in azimuth 65°15′14″. A bronze disk set in a drill hole in a boulder and marking International Boundary Commission station "Chinook" is 8.03 meters from the station in azimuth 79°52′30″.

Nashlinn (Saskatchewan, Maple Creek District; U. S. Coast and Geodetic Survey, 1923).—About 14 miles south and 1 mile west of Consul, Saskatchewan, and about 7 miles north of the International Boundary. It is on high ground about 50 meters east and 25 meters south of the northeast corner post of sec. 4, T. 2, R. 27 W., third meridian, and it is 25 meters east of the section-line road leading from Consul into Montana.

Station mark: A standard Geodetic Survey of Canada bronze-disk station mark set in a square block of concrete. The subsurface mark is a like bronze disk set in a square block of concrete 3 feet underground. Reference mark No. 1 is a standard Geodetic Survey of Canada bronze-disk reference mark with the arrow pointing toward the station set in a square block of concrete 24.46 meters from the station in azimuth 86°39′48″. Reference mark No. 2 is a like mark set in a similar manner 22.21 meters from the station in azimuth 175°32′22″.

Havre North Base (Montana, Hill County; U. S. Coast and Geodetic Survey, 1923; 1925).—About 27 miles north and 3½ miles east of Havre, Montana, and about 4 miles south of the International Boundary. It is on the high ground in SW½ sec. 23, T. 37 N., R. 16 E., principal meridian, and is about 135 meters east of the west section line and road.

Station mark: A standard U. S. C. & G. S. bronze-disk station mark set in a square block of concrete. The subsurface mark is a like bronze disk set in a block of concrete 3 feet underground. References are standard U. S. C. & G. S. reference-mark disks, with the arrows pointing toward the station, set in square concrete blocks. Reference mark No. 1 is 19.32 meters from the station in azimuth 253°41′. Reference mark No. 2 is 22.27 meters from the station in azimuth 7°02′.

Havre South Base (Montana, Hill County; U. S. Coast and Geodetic Survey, 1923; 1925).—About 15 mile north and about 4 miles east of Havre, Montana, and about three-fourths mile northeast of Thibadeau Lake. It is on the top of a small but prominent hill and near the west side of SW¼ sec. 24, T. 35 N., R. 16 E., principal meridian.

Station mark: A standard U. S. C. & G. S. bronze-disk station mark set in a square block of concrete. The subsurface mark is a like bronze disk set in a boulder 3 feet underground. Reference mark No. 1 is a standard U. S. C. & G. S. bronze-disk reference mark set in a square block of concrete 14.30 meters from the station in azimuth 327°16′34″. Reference mark No. 2 is an iron pipe surmounted by a bronze cap marking U. S. Geological Survey station "Thibedeau" and is 5.95 meters from the station in azimuth 103°10′30″.

Old Man (Saskatchewan, Maple Creek District; U. S. Coast and Geodetic Survey, 1923).—About 24 miles south and 18 miles west of East End, Saskatchewan, and 12 miles north of the International Boundary. It is

on the highest point of the southernmost ridge of Old Man Plateau. The station is in the northeast corner of NW_4 sec. 36, T. 2, R. 25 W., third meridian. It is 2 meters west of the half-section-line fence and is one-half mile south of triangulation station "Divide."

Station mark: A standard Geodetic Survey of Canada bronze-disk station mark set in a square block of concrete. The substation mark is a like bronze disk set in a square block of concrete 3 feet underground. Reference mark No. 1 is a standard Canadian Geodetic Survey bronze-disk reference mark set in a square block of concrete 22.09 meters from the station in azimuth 356°57′40″. Reference mark No. 2 is a like bronze disk set in a similar manner 22.71 meters from the station in azimuth 91°56′12″.

Cherry (Montana, Blaine County; Geodetic Survey of Canada, 1922; U. S. Coast and Geodetic Survey, 1923).—About 19 miles north and about 12 miles east of Chinook, Montana, and on the top of one of the several ridges of about the same elevation known as the Cherry Ridges. It is on the northern one of two prominent hills near the northern extremity of the ridge, and is in SW¼ sec. 15, T. 36 N., R. 21 E., principal meridian. "West Cherry", a station of both the International Boundary Commission and of the U. S. Geological Survey, is located on a hill of about the same elevation about 525 meters west of station "Cherry."

Station mark: A standard U. S. C. & G. S. bronze-disk station mark set in a square block of concrete. The reference marks are two U. S. C. & G. S. standard bronze-disk reference marks, with the arrows pointing toward the station, wedged in drill holes in boulders. Reference mark No. 1 is 13.35 meters from the station in azimuth 45°02′58″. Reference mark No. 2 is 17.88 meters from the station in azimuth 194°46′15″.

Lucky (Saskatchewan, Maple Creek District; Geodetic Survey of Canada, 1922; U. S. Coast and Geodetic Survey, 1923).—About 10 miles southwest of the town of Echo, Saskatchewan. It is about $6\frac{1}{2}$ miles north of the International Boundary. It is on an irregular ridge running northwest and southeast and is on the highest point in the vicinity. It is in sec. 3, T. 2, R. 22 W., third meridian, and is near the east side of the section about midway north and south.

Station mark: Standard Geodetic Survey of Canada bronze-disk station marks set in standard concrete surface and subsurface piers. There are no reference marks. The southeast corner of sec. 3 is 876.1 meters south and a little east from the station.

Claydon (Saskatchewan, Maple Creek District; Geodetic Survey of Canada, 1922; U. S. Coast and Geodetic Survey, 1923).—About 15 miles south and 4 miles west of East End, Saskatchewan, and 480 meters east of the East End-Claydon post office road. It is about 21 miles north of the International Boundary and is in NW½ sec. 22, T. 4, R. 22 W., third meridian. The station is 82 meters south of a fence and 558.3 meters southeast of the northeast corner of sec. 21 of the above township and range. It is on land owned by Charles Inghram and is on the top of a knoll northeast of his house, the highest point in the vicinity, near the edge of a wheat field.

Station mark: Geodetic Survey of Canada standard bronze-disk station marks set in standard surface and subsurface concrete piers, the surface pier, 14 inches square, projecting 18 inches above the ground.

Alkali (Montana, Blaine County; Geodetic Survey of Canada, 1922).—On the highest butte in the vicinity, one-half mile east of a prominent cairn. The station is in NE¼ sec. 17, T. 37 N., R. 24 E., principal meridian. Station mark: A standard U. S. Coast and Geodetic Survey station mark; see page 333. The reference mark is the northeast corner of the above section, 549.3 meters from the station in azimuth 223°07′19′′.

Rapdan (Saskatchewan, Maple Creek District; Geodetic Survey of Canada, 1922).—On the east side of the road allowance near the southwest corner of sec. 24, T. 3, R. 20 W., third meridian, on top of a high knoll.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333. One reference mark is a Dominion Lands Survey post at the northeast corner of sec. 14, T. 3, R. 20 W., 35.28 meters from the station in azimuth 29°50′02″. A second reference mark is the northeast corner of a church, 47.65 meters from the station, in a southwesterly direction.

Center (Saskatchewan, Maple Creek District; Geodetic Survey of Canada, 1922).—Approximately 48 miles south of Shaunavon. The station is in NW¼ sec. 3, T. 2, R. 19 W., third meridian, on an inconspicuous knoll 42 meters north of a small frame house.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333. The reference mark is a quarter-section post at the center of the east side of sec. 4, T. 2, R. 19 W., 210.43 meters from the station in azimuth 30°45′47′′. The northwest corner of the house is 42.5 meters from the station; the northeast corner is 42.1 meters from the station.

Climax (Saskatchewan, Maple Creek District; Geodetic Survey of Canada, 1922).—In NW¼ sec. 10, T. 3, R. 18 W., third meridian. The station is on the highest knoll of a flat ridge which continues for about a mile to the southeast after a slight drop in that direction.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333. The reference mark is the northeast corner of sec. 9, which is 536.15 meters from the station in azimuth 99°27′24″.

Big Butte (Montana, Blaine County; Geodetic Survey of Canada, 1922).—In SE¼ sec. 17, T. 37 N., R. 26 E., principal meridian, on the highest point of a prominent ridge running southeast and northwest.

Station mark: A standard U. S. Coast and Geodetic Survey station mark; see page 333. One reference mark is the center of the south side of the above section, 619.0 meters from the station in azimuth 78°49′01″. A second reference mark is the southeast corner of the same section, 236.4 meters from the station.

Edmund (Saskatchewan, Maple Creek District; Geodetic Survey of Canada, 1922).—In NW¼ sec. 32, T. 2, R. 16 W., third meridian. The station is on the east side of the road allowance near the center of the west side of the above quarter section. It is on top of a gradual slope and east of a house.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333. The reference mark is a Dominion Lands Survey post at the northeast corner of sec. 31, T. 2 R. 16 W., 286.51 meters from the station in azimuth 176°02′15″.

Porter (Montana, Phillips County; Geodetic Survey of Canada, 1922).—On the most prominent point in the immediate vicinity, in SE¼ sec. 28, T. 37 N., R. 28 E., principal meridian.

Station mark: A standard U. S. Coast and Geodetic Survey station mark; see page 333. The reference mark is the southeast corner of the above section, 307.29 meters from the station in azimuth 339°22′18″.

Roche (Saskatchewan, Maple Creek District; Geodetic Survey of Canada, 1922).—In sec. 6, T. 3, R. 14 W., third meridian, near the middle of the north side. The station is on the highest part of McArthur's Butte. A trail to the station comes in from the west.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333.

Monchy (Saskatchewan, Maple Creek District; Geodetic Survey of Canada, 1922).—In NW¼ sec. 3, T. 1, R. 14 W., third meridian; on top of a high rounded butte.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333. The reference mark is a Dominion Lands Survey post at the center of the west side of sec. 3, T. 1, R. 14 W., 558.35 meters from the station in azimuth 14°17′35″.

70-Mile Butte (Saskatchewan, Maple Creek District; Geodetic Survey of Canada, 1923).—On the western part of a flat isolated table of the hill known locally as 70-Mile Butte. The station may be reached from the Smith and Sammons ranch by going 1 mile west, 100 meters south, and one-fourth mile west over a good trail; thence over a little-used trail south through a barnyard; for one-half mile around the west end of a slough; and thence about 1 mile in a southerly direction up to a tableland. From this point the route lies first southeast past a large boulder and over a break, and thence south and west, as far as possible following a hogback to the flat isolated table. The station is near the center of the south side of sec. 11, T. 3, R. 13 W., third meridian.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333.

Whitewater (Montana, Phillips County; Geodetic Survey of Canada, 1922).—In NW¼ sec. 6, T. 37 N., R. 32 E., principal meridian, three-tenths mile west and two-fifths mile south of International Boundary Monument 470. The station is on the highest, though not prominent, point in the vicinity.

Station mark: A standard U. S. Coast and Geodetic Survey station mark; see page 333. The reference mark is a General Land Office post at the center of the west side of the above section, 558.5 meters from the station in azimuth 56°04′37″.

Long (Montana, Phillips County; International Boundary Commission, 1910; Geodetic Survey of Canada, 1923).—About 3 miles south of International Boundary Monument 482, near the southeast corner and the south side of SW¼ sec. 17, T. 37 N., R. 34 E., principal meridian. The station is on the highest part of the highest ground east of Frenchman Creek, and is about 30 meters north of a fence near the edge of the steep valley of the creek.

Station mark: The original mark was replaced by a standard U. S. Coast and Geodetic Survey mark in 1923; see page 333. The reference mark is the center of the south side of the above section, 207.00 meters from the station in azimuth 289°08′06′′.

Wideview (Saskatchewan, Maple Creek District; Geodetic Survey of Canada, 1923).—The station may be reached by following the Reliance Trail for 4½ miles from Wideview, then proceeding south along a ravine for one-fourth mile, and thence south along a faintly marked trail to a tableland. The station is in the northwest corner of NE¼ sec. 11, T. 4, R. 10 W., third meridian, at the north end of the tableland about 150 feet from its west edge.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333. The reference mark is a Dominion Lands Survey post at the center of the north side of sec. 11 165.20 meters from the station in azimuth 119°39′21″.

Blum (Saskatchewan, Wood Mountain District; Geodetic Survey of Canada, 1923).—Twelve miles south of Wideview or 45 miles south of Hazenmore in NE¼ sec. 20, T. 2, R. 9 W., third meridian.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333. The reference mark is the Dominion Lands Survey post marking the center of the east side of the above section, 186.2 meters from the station in azimuth 316°59′23″.

Peaked Butte (Saskatchewan, Wood Mountain District; Geodetic Survey of Canada, 1923).—On the highest peak of three at a point where a ridge from the west bends sharply to the south. The station is in SW¼ sec. 6, T. 3, R. 6 W., third meridian.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333. The reference mark is the Dominion Lands Survey post at the southeast corner of sec. 1, T. 3, R. 7 W., 512.89 meters from the station

in azimuth 30°00′17′′.

Thoeny (Montana, Valley County; Geodetic Survey of Canada, 1923).—In NE¼ sec. 13, T. 36 N., R. 37 E., principal meridian. The station is 4½ miles east of Thoeny, on the road to Opheim. It is one-third mile north of a bend toward the north in that road, and on the highest point just west of a sharp turn toward the east of the north branch of the same road.

Station mark: A standard U. S. Coast and Geodetic Survey station mark; see page 333. The reference mark is a General Land Office post at the center of the west side of the above section, 1,274.60 meters from the station in azimuth 69°00′22′′.

Clay Butte (Saskatchewan, Wood Mountain District; Geodetic Survey of Canada, 1923).—On top of a clay butte 6 miles due east of Southview post office. The station is in SW¼ sec. 3, T. 3, R. 5 W., third meridian.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333. The reference mark is a Dominion Lands Survey post marked "II, V," at the northeast corner of sec. 33, T. 2, R. 5 W., 246.71 meters from the station in azimuth 294°07′10′′.

Roanwood (Montana, Valley County; Geodetic Survey of Canada, 1923).—On the edge of a sharp change of slope, in the northwest corner of SE¼ sec. 36, T. 37 N., R. 39 E., principal meridian.

Station mark: A standard U. S. Coast and Geodetic Survey station mark; see page 333. The reference mark is a General Land Office post at the southeast corner of the above quarter section, 944.68 meters from the station in azimuth 302°01′25″.

Glentana (Montana, Valley County; Geodetic Survey of Canada, 1923).—Near the edge of a tableland overlooking the Poplar River valley. The station is near the center of the north side of SE¼ sec. 11, T. 36 N., R. 41 E., principal meridian.

Station mark: A standard U. S. Coast and Geodetic Survey station mark; see page 333. The reference mark is a General Land Office post at the southeast corner of the above section, 871.74 meters from the station

in azimuth 324°36′31″.

Table Butte (Saskatchewan, Wood Mountain District; Geodetic Survey of Canada, 1923).—On the highest point in SE¼ sec. 13, T. 2, R. 3 W., third meridian, about three-fourths mile east by south from Table Butte.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333. The reference mark is a Dominion Lands Survey post at the northeast corner of sec. 12, T. 2, R. 3 W., 328.47 meters from the station in azimuth 320°16′29′′.

Richland (Montana, Daniels County; Geodetic Survey of Canada, 1923).—In the southeast corner of NE¼ sec. 34, T. 37 N., R. 43 E., principal meridian.

Station mark: A standard U. S. Coast and Geodetic Survey station mark; see page 333. The reference mark is a General Land Office post at the southeast corner of the above section, 874.93 meters from the station in azimuth 341°13′58″.

Quantock (Saskatchewan, Wood Mountain District; Geodetic Survey of Canada, 1923).—In SE¼ sec. 3, T. 3, R. 1 W., third meridian. The station is about 300 meters west of the east fence and approximately 500 meters south of a farmhouse.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333. The reference mark is a Dominion Lands Survey post at the center of the east side of the above section, 301.84 meters from the station in azimuth 247°40′42″.

Templeman (Montana, Daniels County; Geodetic Survey of Canada, 1923).—Near the middle of SW¼ sec. 30, T. 36 N., R. 45 E., principal meridian. The station is on the east edge of Horseshoe Basin on the road to Richland, about 100 yards east from the edge of the drop and about one-fourth mile west of a fence corner where the road from Opheim angles northwest into the basin.

Station mark: A standard U. S. Coast and Geodetic Survey station mark; see page 333. The reference mark is a General Land Office post at the center of the south side of the above section, 657.07 meters from the station in azimuth 309°10′27″.

Fife Lake (Saskatchewan, Wood Mountain District; Geodetic Survey of Canada, 1923).—About 1 mile east and one-fourth mile south of the Johnson ranch house, in SE¼ sec. 27, T. 2, R. 29 W., second meridian.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333. The reference mark is a Dominion Lands Survey post at the northeast corner of sec. 22, T. 2, R. 29 W., 368.32 meters from the station, in azimuth 283°03′57″.

Poplar (Saskatchewan, Wood Mountain District; C. H. Sinclair, 1911; Geodetic Survey of Canada, 1923).— About 1½ miles north of International Boundary Monument 533, near the southwest corner of NW¼ sec. 8, T. 1, R. 27 W., second meridian. The station is on the most northern high point of the ridge, a round knoll 200 meters west of a trail leading southward up a draw to a farmstead, which can be seen at the upper end.

Station mark: A bronze disk, marked "U. S. & C. B. SURVEY", set in a concrete pier. One reference mark is a cross cut in a granite rock, 8.645 meters from the station in azimuth 345°. A second reference mark is an arrow, cut in a granite rock set on edge, 8.5 meters from the station in azimuth 80°. In 1922 the Geodetic Survey of Canada recovered the station and established a new station of the same name 6.55 meters from the original station in azimuth 186°56′. The new station mark is a standard Geodetic Survey of Canada station mark; see page 333. The reference mark is a Dominion Lands Survey post at the center of the west side of the above section, 260.87 meters from the station in azimuth 66°43′11″.

Eddyside (Saskatchewan, Wood Mountain District; Geodetic Survey of Canada, 1923).—About 1½ miles north and one-half mile west of Eddyside post office. In NE¼ sec. 12, T. 2, R. 26 W., second meridian.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333. The reference mark is a Dominion Lands Survey post at the center of the north side of the above section, 138.03 meters from the station in azimuth 176°42′23″.

Madoc (Montana, Daniels County; Geodetic Survey of Canada, 1923).—About 2 miles west of Madoc in NW¼, sec. 7, T. 35 N., R. 49 E., principal meridian, about 200 meters south and 300 meters west of the corner where the state road to Scobey is intersected by the road which runs to the south.

Station mark: A standard U. S. Coast and Geodetic Survey station mark; see page 333.

Whitetail (Montana, Daniels County; Geodetic Survey of Canada, 1923).—Near the center of the west side of NE½ sec. 23, T. 37 N., R. 49 E., principal meridian, on the extreme eastern edge of a tableland and about 400 meters directly west of a school.

Station mark: A standard U. S. Coast and Geodetic Survey station mark; see page 333. The reference mark is a General Land Office post at the center of the north side of the above section, 354.84 meters from the station in azimuth 164°29′47″.

Flaxville (Montana, Daniels County; Geodetic Survey of Canada, 1923).—In SW¼, sec. 24, T. 35 N., R. 50 E., principal meridian, about 75 meters west and 100 meters north of the southeast corner of this quarter section.

Station mark: A standard U. S. Coast and Geodetic Survey station mark; see page 333. The reference mark is a General Land Office post at the southeast corner of the above quarter section, 120.56 meters from the station in azimuth 341°35′25″.

Mervin (Saskatchewan, Wood Mountain District; C. H. Sinclair, 1911; Geodetic Survey of Canada, 1923).— About 1 mile west and 1 mile south of Paisley Brook post office, and about $2\frac{1}{2}$ miles northeast of International Boundary Monument 550, in the SE¼ sec. 17, T. 1, R. 23 W., second meridian. The station is on top of a round knob 70 meters north of the point where a trail goes over a ridge.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a concrete block flush with the ground. In 1923 the Geodetic Survey of Canada recovered the station and established a new station of the same name 3.304 meters from the original station in azimuth 189°19′25″. The new station mark is a standard Geodetic Survey of Canada station mark; see page 333. The Dominion Lands Survey post midway on the east line of sec. 17 is 642.26 meters from the Geodetic Survey of Canada station in azimuth 244°45′00″.

Ross (Montana, Sheridan County; Geodetic Survey of Canada, 1923).—Near the north side of lot 2, sec. 5, T. 37 N., R. 53 E., principal meridian, in a farm yard about 30 meters south of a stable near a white house.

Station mark: A standard U. S. Coast and Geodetic Survey station mark; see page 333. The reference mark is a General Land Office stone post at the northeast corner of the above lot, 410.39 meters from the station in azimuth 237°19′33″.

Plentywood (Montana, Sheridan County; Geodetic Survey of Canada, 1923).—About one-half mile north and 1 mile east of a white frame school, on the highest point of the butte in NE¼ sec. 11, T. 34 N., R. 53 E., principal meridian.

Station mark: A standard U. S. Coast and Geodetic Survey station mark; see page 333. The reference mark is a General Land Office post at the center of the north side of the above section, 704.68 meters from the station in azimuth 123°35′31″.

Bruce (Montana, Sheridan County; Geodetic Survey of Canada, 1923).—Most easily reached from Raymond, Montana. The station is in SW½ sec. 24, T. 37 N., R. 54 E., principal meridian.

Station mark: A standard U. S. Coast and Geodetic Survey station mark; see page 333. The reference mark is the southwest corner of the above section, 707.97 meters from the station in azimuth 32°13′37″.

Dooley (Montana, Sheridan County; Geodetic Survey of Canada, 1923).—One mile south and one-fourth mile east of the town of Dooley. The station is in NW¼ sec. 22, T. 36 N., R. 56 E., principal meridian, at the center of the west side of this quarter section, on top of a hill 50 yards east of a grade road.

Station mark: A standard U.S. Coast and Geodetic Survey station mark; see page 333.

Tangedal (Saskatchewan, Weyburn District; Geodetic Survey of Canada, 1923).—About 2 miles east and 4 miles north of Fairlawn post office, in the northeast corner of sec. 28, T. 1, R. 18 W., second meridian. The station is on top of a knoll about 125 meters west of the highest point on a road between secs. 27 and 28 where it turns to the east around the knoll.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333. The reference mark is a Dominion Lands Survey post at the northeast corner of the above section, 96.95 meters from the station in azimuth 235°39′15″.

Trees (Saskatchewan, Weyburn District; Geodetic Survey of Canada, 1923).—About 3 miles south and 1 mile west of Burton post office in NE¼ sec. 26, T. 1, R. 16 W., second meridian, about 60 meters northwest of a stable.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333. The reference mark is a Dominion Lands Survey post at the northeast corner of the above section, 345.03 meters from the station in azimuth 255°26′27″.

Alkabo (North Dakota, Divide County; Geodetic Survey of Canada, 1923).—About 140 meters south and 50 meters east of the center of the section in SE¼ sec. 11, T. 162 N., R. 102 W., fifth principal meridian.

Station mark: A standard U. S. Coast and Geodetic Survey station mark; see page 333.

Agate (Saskatchewan, Weyburn District; Geodetic Survey of Canada, 1923).—About 18 miles south and 3 miles east of Tribune at a point 1 mile west of the Rangeview school. This school is 7 miles north and 3 miles west of the village of Fortuna, North Dakota. The station is in NW½ sec. 8, T. 1, R. 14 W., second meridian.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333. The reference mark is the center of the north side of the above section, 451.78 meters from the station in azimuth 202°26′32′′.

Norge (North Dakota, Divide County; U. S. Coast and Geodetic Survey, 1912; Geodetic Survey of Canada, 1924).—About 22 meters south of a road on the highest part of a rounded ridge in the NW¼NW¼ sec. 3, T. 162 N., R. 101 W., fifth principal meridian.

Station mark: A standard U. S. Coast and Geodetic survey bronze-disk station mark set in the top of a concrete cylinder 7 inches in diameter and 30 inches long incased in a galvanized-iron pipe which was used for the form. The cylinder projects 3 inches above the ground. The underground mark is a brass bolt one-fourth inch in diameter and 2 inches long set in a block of concrete 6 inches square on top and 4 inches thick. The bolt projects one-fourth inch above the concrete and is about 33 inches below the surface of the ground. One reference mark is a standard U. S. Coast and Geodetic Survey bronze-disk reference mark on the township road on the west slope of a hill, 87.10 meters from the station in azimuth 173°20′. A second reference mark is a fence post at the southeast corner of sec. 33, T. 163 N., R. 101 W., 337.00 meters from the station in azimuth 107°29′25″.

Pole (North Dakota, Divide County; Geodetic Survey of Canada, 1923).—On top of a hill, 5 miles north of Fortuna and three-fourths mile south of a school; in NW½ sec. 11, T. 163 N., R. 101 W., fifth principal meridian. Station mark: A standard U. S. Coast and Geodetic Survey station mark; see page 333. The reference mark is a fence post at the northwest corner of the above section, 268.90 meters from the station in azimuth 172°31′18″.

Messers (Saskatchewan, Weyburn District; Geodetic Survey of Canada, 1923).—Near the northwest corner of SE¼ sec. 15, T. 1, R. 13 W., second meridian. The station is on a ridge about 100 meters north of a trail which is on the north side of a slough.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333. The reference mark is the Dominion Lands Survey post at the center of the north side of sec. 10, 382.51 meters from the station in azimuth 5°38′36″.

Ambrose (North Dakota, Divide County; U. S. Coast and Geodetic Survey, 1912).—In SE¼ sec. 27, T. 163 N, R. 99 W., fifth principal meridian. The station is about 175 meters southeast of a house.

Station mark: A standard U. S. Coast and Geodetic Survey bronze-disk station mark set in the top of a concrete cylinder 7 inches in diameter and 30 inches long incased in a galvanized-iron pipe. The cylinder projects 3 inches above the ground. The subsurface mark, 33 inches below the surface, is a brass bolt one-fourth inch in diameter and 2 inches long set in a block of concrete 6 inches square and 4 inches thick. The bolt projects a little above the concrete. The reference mark is a standard U. S. Coast and Geodetic Survey reference-mark disk about 2 meters from the southeast corner of the house, 173.43 meters from the station in azimuth 150°30′.

Crosby (North Dakota, Divide County; U. S. Coast and Geodetic Survey, 1912; Geodetic Survey of Canada, 1924).—About 6% miles south and 3½ miles west of Ambrose in the NE½ sec. 17, T. 162 N., R. 99 W., fifth principal meridian, on land belonging to C. J. Christiansen, who lives about 2 miles east.

Station mark: A standard U. S. C. & G. S. bronze-disk station mark set in the top of a concrete cylinder 7 inches in diameter and 30 inches long incased in a galvanized-iron pipe which was used for a form. The cylinder projects 3 inches above the ground. There is no underground mark. A standard U. S. C. & G. S. bronze-disk reference mark set in a concrete cylinder in the same manner as the station mark is on the half-section line on the south slope of the knoll 137.46 meters distant (measured over the ground) in azimuth 349°59′. The chimney of a white schoolhouse a little more than one-half mile distant is in azimuth 209°47′.

Ambrose Southwest Base (North Dakota, Divide County; U. S. Coast and Geodetic Survey, 1912; Geodetic Survey of Canada, 1924).—About 3⅓ miles south of International Boundary Monument 596; in the northwest corner of sec. 13, T. 163 N., R. 100 W., fifth principal meridian, about 60 meters south of an east-and-west road and 70 meters east of a north-and-south road.

Station mark: A standard U. S. C. & G. S. cap station mark, screwed to the top of a 3-inch iron pipe, which is embedded in a cylinder of concrete 10 inches in diameter and 30 inches long. The cylinder projects 3 inches above the ground. The underground mark is a brass bolt one-fourth inch in diameter and 2 inches long set in a block of concrete 6 inches square on top and 4 inches thick. The bolt projects a little above the concrete and is about 33 inches below the surface of the ground. A standard U. S. C. & G. S. bronze-disk reference mark set in the top of a concrete cylinder 5½ inches in diameter and 30 inches long incased in a galvanized-iron pipe which was used for the form, and projecting about 3 inches above the ground, is close to the property line at the southeast corner of the road crossing and is 79.58 meters from the station in azimuth 127°37′.

Ambrose Northeast Base=School (North Dakota, Divide County; C. H. Sinclair, 1911; U. S. Coast and Geodetic Survey, 1912; Geodetic Survey of Canada, 1924).—This is station "School" of the International Boundary Commission. It is about 2½ miles north of Ambrose, 0.7 mile southeast of International Boundary Monument 601; in the NW¼ sec. 36, T. 164 N., R. 99 W., fifth principal meridian, near the west boundary of the section. The station is in and east of the center of a public road which runs north from the west side of Ambrose. It is 0.1 mile north of a deep ravine and is on the highest knoll in the vicinity.

Station mark: A bench-mark post projecting 16 inches above the ground. The reference mark is a drill hole in the top of a stone post projecting 4 inches above the ground, 17.09 meters from the station in azimuth 352°28′. The east gable of a white house is 180 meters from the station in azimuth 99°01′.

Bowie (North Dakota, Divide County; C. H. Sinclair, 1911; U. S. Coast and Geodetic Survey, 1912; Geodetic Survey of Canada, 1924).—About 11½ miles west and 3 miles north of Ambrose, in the east half of fractional sec. 25, T. 164 N., R. 101 W., fifth principal meridian, on a knoll just south of the International Boundary.

Station mark: A bronze disk stamped "U. S. & C. B. SURVEY" in a concrete pier 12 by 12 by 19 inches set firmly in the ground and surmounted with a cairn. International Boundary Monument 592 is 90.70 meters from the station in azimuth 134°05′.

Schnell (Saskatchewan, Weyburn District; Geodetic Survey of Canada, 1923).—About 1 mile east of the blue twin bridges over Long Creek and a short distance south of a horseshoe bend in the creek, and on its east side. The station is in the northeast corner of NW¼ sec. 24, T. 1, R. 12 W., second meridian.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333. The reference mark is a Dominion Lands Survey post at the northeast corner of the above quarter section, 69.55 meters from the station in azimuth 213°28′45″.

Hansen (North Dakota, Divide County; Geodetic Survey of Canada, 1923).—In the southeast corner of SE¼ sec. 17, T. 163 N., R. 98 W., fifth principal meridian.

Station mark: A standard U. S. Coast and Geodetic Survey station mark; see page 333. The reference mark is a General Land Office post at the southeast corner of the above section, 24.7 meters from the station in azimuth 279°08′55″.

Gardner (Saskatchewan, Weyburn District; Geodetic Survey of Canada, 1924).—In NW¼ sec. 11, T. 2, R. 10 W., second meridian, on a knoll 270 meters east of the west side of the section and one-third mile south of its north limit. The station is across the road from, and almost due south of some farm buildings.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333. The reference marks are Dominion Lands Survey posts, one at the northeast corner of sec. 10, T. 2, R. 10 W., 597.5 meters from the station in azimuth 153°03′02′′; the second at the center of the east side of sec. 10, T. 2, R. 10 W., 384.7 meters from the station in azimuth 44°59′41′′.

Peterson (North Dakota, Divide County; Geodetic Survey of Canada, 1924).—One mile north and two miles east of Crosby, nearly one mile due south of a house. The station is in SW¼ sec. 23, T. 163 N., R. 97 W., fifth principal meridian, and is about 90 meters east of the west side of sec. 23 and about 135 meters southeast of a stone pile.

Station mark: A standard U. S. Coast and Geodetic Survey station mark; see page 333.

Estevan (Saskatchewan, Assiniboia District; Geodetic Survey of Canada, 1924).—About 3½ miles east of the town of Estevan, on the only prominent hill in the locality. The station is in SW¼ sec. 17, T. 2, R. 7 W., second meridian.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333. The reference mark is a Dominion Lands Survey post at the center of the north side of sec. 8, T. 2, R. 7 W., 584.73 meters from the station in azimuth 331°52′21″.

Cook (North Dakota, Burke County; Geodetic Survey of Canada, 1924).—In NE¼ sec. 29, T. 162 N., R. 94 W., fifth principal meridian, on high ground about 300 meters due east of a farmhouse.

Station mark: A standard U.S. Coast and Geodetic Survey station mark; see page 333. The reference mark is a marked stone and mound at the center of the east side of sec. 29, 571.52 meters from the station in azimuth 288°56′02″.

Dunbar (Saskatchewan, Assiniboia District; Geodetic Survey of Canada, 1924).—About 6 miles west and 2½ miles north of North Portal. The station is in NW¼ sec. 18, T. 1, R. 5 W., second meridian.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333. The reference mark is a Dominion Lands Survey post, at the center of the east side of sec. 13, T. 1, R. 6 W., 804.38 meters from the station in azimuth 55°08′48″.

Short Creek (North Dakota, Burke County; Geodetic Survey of Canada, 1924).—On the east side of a road, 1 mile east and 5 miles north of Columbus, in the southeast corner of NW¼ sec. 4, T. 163 N., R. 93 W., fifth principal meridian. The station is one-half mile north of a house and about 135 meters south of Short Creek.

Station mark: A standard U.S. Coast and Geodetic Survey station mark; see page 333. The reference mark is the center of the west side of the above section, 465.89 meters from the station in azimuth 75°07′46′′.

Lignite (North Dakota, Burke County; Geodetic Survey of Canada, 1924).—In NE¼ sec. 12, T. 162 N., R. 92 W., fifth principal meridian, on a knoll about one-third mile east of the village of Lignite and about 135 meters north of the Great Northern Railway tracks. There is a farmhouse across the road to the north and about 100 meters to the west.

Station mark: A standard U.S. Coast and Geodetic Survey station mark; see page 333. The reference mark is a marked stone in the center of the road 10 inches below grade, which marks the center of the east side of the above section. This stone is 506.25 meters from the station in azimuth 343°29′25″.

Spy (Saskatchewan, Assiniboia District; Geodetic Survey of Canada, 1924).—On a very prominent knoll known locally as Scout Hill about 2 miles northwest of the village of Northgate, North Dakota, in NW¼ sec. 12, T. 1, R. 3 W., second meridian.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333. The reference marks are Dominion Lands Survey posts, one at the northeast corner of sec. 12, T. 1, R. 3 W., 1,300.8 meters from the station in azimuth 248°13′59″; the second at the center of the east side of the same section, 1,250.26 meters from the station in azimuth 284°55′48″.

Portal (Saskatchewan, Assiniboia District; Geodetic Survey of Canada, 1924).—On or near the International Boundary between North Portal, Saskatchewan, and Portal, North Dakota. The station is on the road allowance south of SE½ sec. 1, T. 1, R. 5 W., second meridian.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333. The reference mark is the center of the south side of the above section, 339.26 meters from the station in azimuth 95°01′43″.

Flaxton (North Dakota, Burke County; Geodetic Survey of Canada, 1924).—About one-half mile north and 2½ miles east of Flaxton. The station is in the southwest corner of NW¼ sec. 35, T. 163 N.,R. 90 W., fifth principal meridian, about one-third mile south and one-fourth mile east of a house.

Station mark: A standard U.S. Coast and Geodetic Survey station mark; see page 333. The reference mark is the center of the east side of sec. 34, T. 163 N., R. 90 W., 108.75 meters from the station in azimuth 47°25′51′′.

McGillivray (North Dakota, Burke County; Geodetic Survey of Canada, 1924).—In SW¼ sec. 25, T. 163 N., R. 88 W., fifth principal meridian, near the south boundary of the section, about 300 meters due west of a house.

Station mark: A standard U. S. Coast and Geodetic Survey station mark; see page 333. The reference mark is the corner mark at the center of the south side of the above section, 286.40 meters from the station in azimuth 281°38′06″.

Martin (Saskatchewan, Assiniboia District; Geodetic Survey of Canada, 1924).—In NE¼ sec. 16, T. 1, R. 1 W., second meridian, about one-fourth mile north of a house.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333. The reference mark is the corner mark at the center of the north side of the above section, 568.65 meters from the station in azimuth 150°15′02′′.

Bluel (North Dakota, Renville County; Geodetic Survey of Canada, 1924).—In SW¼ sec. 20, T. 163 N., R. 86 W., fifth principal meridian. The station is about 50 meters northwest of a house.

Station mark: A standard U. S. Coast and Geodetic Survey station mark; see page 333. The reference mark is the corner mark at the center of the west side of the above section, 851.80 meters from the station in azimuth 141°04′58″.

Goertz (Saskatchewan, Assiniboia District; Geodetic Survey of Canada, 1924).—In SE¼ sec. 28, T. 1, R. 33 W., principal meridian. The station is just west of the middle of the east side of the above section, on the edge of a pothole in the prairie.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333. The reference mark is the corner mark at the center of the east side of the above section, 105.07 meters from the station in azimuth 234°51′47″.

Harris (Saskatchewan, Assiniboia District; Geodetic Survey of Canada, 1924).—In NW¼ sec. 19, T. 1, R. 31 W., principal meridian, about 30 meters east of the west boundary of the section and about 340 meters south of the north boundary of the section. The station is about 50 meters southwest of a barn and 18 meters south of a granary.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333.

Trout (North Dakota, Renville County; Geodetic Survey of Canada, 1924).—In SW¼ sec. 1, T. 162 N., R. 85 W., fifth principal meridian, on high ground about 450 meters southeast of a house, and 18 meters south of a ridge of drifted soil.

Station mark: A standard U. S. Coast and Geodetic Survey station mark; see page 333. The reference mark is the corner mark at the center of the west side of the above section, 391.482 meters from the station in azimuth 94°15′16′′.

Gainsborough (Saskatchewan, Assiniboia District; Geodetic Survey of Canada, 1924).—About 9 miles south and 2 miles east of the village of Gainsborough. The station is in SE¼ sec. 22, T. 1, R. 30 W., principal meridian, on high ground about one-half mile southeast of a house.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333. The reference mark is the northeast corner mark of sec. 15, T. 1, R. 30 W., 173.70 meters from the station in azimuth 308°26′24.″

Mohall (North Dakota, Bottineau County; Geodetic Survey of Canada, 1924).—In NW¼ sec. 2, T. 162 N., R. 83 W., fifth principal meridian. The station is on high ground about one-third mile due north of a house.

Station mark: A standard U. S. Coast and Geodetic Survey station mark; see page 333. The reference mark is the northwest corner mark of the above section, 214.802 meters from the station in azimuth 127°51′32′′.

Lyleton (Manitoba, Souris District; Geodetic Survey of Canada, 1925).—In SW¼ sec. 28, T. 1, R. 28 W., principal meridian, about 400 meters due north of Lyleton railway station. The triangulation station is about 30 meters north and 15 meters east of a deserted house and about 100 meters due east of a red barn.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333. The reference mark is the corner mark at the center of the east side of the above section, 1,268.15 meters from the station in azimuth 246°24′44″.

Westhope (North Dakota, Bottineau County; Geodetic Survey of Canada, 1925).—In NE¼ sec. 35, T. 163 N., R. 81 W., fifth principal meridian, about 20 meters west of the east side of the section and about one-half mile east of a house.

Station mark: A standard U. S. Coast and Geodetic Survey station mark; see page 333. The reference mark is the corner mark at the center of the east side of the above section, 522.06 meters from the station in azimuth 357°38′52″.

Hayden (Manitoba, Souris District; Geodetic Survey of Canada, 1925).—In SE½ sec. 25, T. 1, R. 27 W., principal meridian. The station is near the center of the section and about 135 meters east of a large stone pile.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333. The reference mark is the corner mark at the center of the east side of sec. 26, T. 1, R. 27 W., 993.78 meters from the station in azimuth 91°12′06″

Malme (North Dakota, Bottineau County; Geodetic Survey of Canada, 1925).—In NW¼ sec. 22, T. 163 N., R. 79 W., fifth principal meridian. The station is about 22 meters east of the west side of the section and about 315 meters south of a house.

Station mark: A standard U. S. Coast and Geodetic Survey station mark; see page 333. The reference mark is the northwest corner of the above section, 384.07 meters from the station in azimuth 175°45′21″.

Souris (North Dakota, Bottineau County; Geodetic Survey of Canada, 1925).—About 1½ miles north and 3 miles west of the village of Souris, in SE¼ sec. 10, T. 163 N., R. 78 W., fifth principal meridian, near the center and 18 meters north of the south boundary of the section. The station is about 90 meters southwest of a house.

Station mark: A standard U. S. Coast and Geodetic Survey station mark; see page 333.

Temple (Manitoba, Souris District; Geodetic Survey of Canada, 1925).—About 2 miles east and 1 mile south of the town of Waskada in SE¼ sec. 34, T. 1, R. 25 W., principal meridian. The station is 180 meters due west of some small deserted buildings across the road in section 35 and about one-fourth mile southeast of a large square deserted house with a cottage roof.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333.

Johnson (North Dakota, Bottineau County; Geodetic Survey of Canada, 1922).—On the second high ridge of the Turtle Mountains as approached from the west, about one-third mile north of a deserted house. The station is accessible by motor from Souris, by first traveling west, then southeast, and then nearly due north along a rock-strewn trail for 5 or 6 miles. The station is in SE½ sec. 34, T. 164 N., R. 76 W., fifth principal meridian, near the east side of the section.

Station mark: A standard U. S. Coast and Geodetic Survey station mark; see page 333.

Declercq (Manitoba, Souris District; Geodetic Survey of Canada, 1925).—About 5 miles east and $1\frac{1}{2}$ miles south of Goodlands in SW $\frac{1}{2}$ section line and is about 90 meters south of a road from Goodlands.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333.

Scott (Manitoba, Souris District; Geodetic Survey of Canada, 1925).—In the Turtle Mountain Forest Reserve close to the road leading from the main cabin to the west cabin of the reserve. The station is in NW¼ sec. 27, T. 1, R. 21 W., principal meridian. Information regarding its location and the road to it may be found by inquiring at Boissevain, Manitoba.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333.

Summit (Manitoba, Souris District; J. J. McArthur, 1910; Geodetic Survey of Canada, 1925).—On the highest point in the Turtle Mountains in SE¼ sec. 1, T. 1, R. 23 W., principal meridian, about 3½ meters north of International Boundary Monument 699. In dry weather the station can be reached with a light car from Bottineau, North Dakota, via the Lake Metigoshe road.

Station mark: A standard Geodetic Survey of Canada station mark, see page 333, replacing the original mark of the International Boundary Commission.

Olie (North Dakota, Bottineau County; Geodetic Survey of Canada, 1925).—In sec. 2, T. 163 N., R. 74 W., fifth principal meridian; on a hill about 270 meters northwest of a house.

Station mark: A standard U. S. Coast and Geodetic Survey station mark; see page 333.

Dunseith (North Dakota, Rolette County; Geodetic Survey of Canada, 1925).—In SW¼ sec. 21, T. 163 N., R. 72 W., fifth principal meridian. The station is about 1½ miles east and one-fourth mile north of a prominent wooded hill and about one-fourth mile due east of a group of small deserted farm buildings in a small wood.

Station mark: A standard U.S. Coast and Geodetic Survey station mark; see page 333.

Ninga H (Manitoba, Souris District; J. G. Hefty, 1918; Geodetic Survey of Canada, 1925).—In the east end of the Turtle Mountain Forest Reserve, about 1 mile south of Lake William; on the summit of a very prominent knoll known as the Turtle's Back; in SE½ sec. 18, T. 1, R. 19 W., principal meridian. This station was originally established in 1918 to replace station "Ninga" of 1911 which had been destroyed.

Station mark: In 1918 the station was marked by a wooden hub. In 1919 the wooden hub was replaced by a cross cut in a rock 6 by 6 by 6 inches placed 20 inches underground, and a surface mark, consisting of a bronze disk inscribed "U. S. & C. B. SURVEY" set in a granite boulder 20 by 20 by 20 inches, was set flush with the ground. In 1925 the Geodetic Survey of Canada established a first-order station, calling it "Ninga H", within a few feet of the station of 1918 and marked it with a standard Geodetic Survey of Canada station mark; see page 333. No connection between the two stations was recorded.

Ram (Manitoba, Souris District; Geodetic Survey of Canada, 1925).—About three-fourths mile east and 1 mile south of the town of Ninga, in SE¼ sec. 8, T. 3, R. 18 W., principal meridian. The station is about 180 meters north of the Little Pembina River.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333. The reference mark is a Dominion Lands Survey post at the center of the east side of the above section, 310.49 meters from the station in azimuth 244°26′53″.

St. John (North Dakota, Rolette County; Geodetic Survey of Canada, 1925).—Near the center of the north boundary of SW¼ sec. 29, T. 163 N., R. 70 W., fifth principal meridian. The station is on top of a hill near some deserted farm buildings, about one-fourth mile west of a road.

Station mark: A standard U. S. Coast and Geodetic Survey station mark; see page 333.

Lena (Manitoba, Souris District; Geodetic Survey of Canada, 1925).—About 3 miles due south of the town of Lena in SE¼ sec. 10, T. 1, R. 17 W., principal meridian.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333. The reference mark is a Dominion Lands Survey post at the center of the east side of the above section, 523.7 meters from the station in azimuth 265°58′37″.

Killarney (Manitoba, Souris District; Geodetic Survey of Canada, 1925).—About 1 mile southwest of the town of Killarney, on a high ridge just south of the lake. This ridge is heavily wooded on the north side and slopes off to a rocky meadow on the south. The station is in NW¼ sec. 34, T. 2, R. 17 W., principal meridian, about one-fourth mile west of a farmhouse.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333.

Margaret Northwest Base (Manitoba, Souris District; Geodetic Survey of Canada, 1925).—In SE¼ sec. 6, T. 5, R. 18 W., principal meridian.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333. The reference mark is a Dominion Lands Survey post at the center of the north side of sec. 31, T. 4, R. 18 W., about 200 meters from the station in azimuth 10°50′05″.

Fairhall Southeast Base (Manitoba, Souris District; Geodetic Survey of Canada, 1925).—In SE¼ sec. 11, T. 4, R. 17 W., principal meridian, about 140 meters west of the eastern boundary of the section, on a prominent hill which is apparently the highest point in the neighborhood.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333.

Mowbray (Manitoba, Souris District; Geodetic Survey of Canada, 1925).—In SE¼ sec. 32, T. 2, R. 14 W., principal meridian. The station mark should be visible from the southwest corner of the quarter section.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333. The reference mark is a Dominion Lands Survey post at the northeast corner of sec. 29, T. 2, R. 14 W., 544.435 meters from the station in azimuth 297°10′25″.

Holmfield (Manitoba, Souris District; Geodetic Survey of Canada, 1925).—One mile due south of the town of Holmfield, in the extreme southeast corner of SE¼ sec. 13, T. 2, R. 16 W., principal meridian, and about 70 meters north of Stinking Lake. There are three prominent hills to the south.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333. The reference mark is a Dominion Lands Survey post at the northeast corner of sec. 12, T. 2, R. 16 W., 83.92 meters from the station in azimuth 286°45′55″.

Taylor (Manitoba, Souris District; Geodetic Survey of Canada, 1925).—In SE¼ sec. 7, T. 1, R. 14 W., principal meridian; about 180 meters west of a house.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333.

Clearwater (Manitoba, Lisgar District; Geodetic Survey of Canada, 1925).—In NW¼ sec. 22, T. 2, R. 13 W., principal meridian; on a very prominent knoll which is the highest point in the vicinity.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333.

Sarles (North Dakota, Towner County; Geodetic Survey of Canada, 1925).—Near the center of sec. 4, T. 163 N., R. 65 W., fifth principal meridian; about one-third mile due south of Dash schoolhouse and 9 meters south of an old stone ruin.

Station mark: A standard U. S. Coast and Geodetic Survey station mark; see page 333.

Fallison (North Dakota, Cavalier County; Geodetic Survey of Canada, 1925).—In SE¼ sec. 2, T. 163 N., R. 64 W., fifth principal meridian.

Station mark: A standard U. S. Coast and Geodetic Survey station mark; see page 333. The reference mark is a General Land Office post at the southeast corner of the above section, 407.35 meters from the station in azimuth 350°55′33″.

Pilot Mound (Manitoba, Lisgar District; Geodetic Survey of Canada, 1925).—On a prominent knoll known as Pilot Mound, 1 mile northwest of the town of Pilot Mound. The station is in SE¼ sec. 20, T. 3, R. 11 W., principal meridian.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333. The reference mark is the northwest corner of sec. 16, T. 3, R. 11 W., about 539 meters from the station in azimuth about 310°32′.

Star Mound (Manitoba, Lisgar District; J. G. Hefty, 1919; Geodetic Survey of Canada, 1925).—About 4 miles west and 1 mile north of the town of Snowflake, on the summit of Star Mound—the most prominent hill in the locality, in SE¼ sec. 27, T. 1, R. 10 W., principal meridian, and near the south line of the section. The summit of the mound is an ancient burial ground.

Station mark: A bronze disk set in an irregular granite boulder of about 200 pounds weight set with its top about 4 inches above the surface of the ground. The subsurface mark is a cross cut in a stone 12 by 12 by 8 inches placed 30 inches underground. A cross cut on a large flat boulder 30 inches wide, flush with the ground, is 30.4 meters southeast of the station and directly in line with a windmill about one-fourth mile distant. In

1925 the Geodetic Survey of Canada recovered the station and established a first-order station under the same name 39.9 meters from the original station in azimuth 256°57′28″. The new station is marked by a standard Geodetic Survey of Canada station mark; see page 333. The reference mark is the Dominion Lands Survey post at the center of the north line of sec. 22, T. 1, R. 10 W., 306.58 meters from the station in azimuth 79°35′30″.

Manitou (Manitoba, Lisgar District; Geodetic Survey of Canada, 1925).—About 1¼ miles west and 1½ miles north of the town of Manitou, in the northwest corner of SE¼ sec. 36, T. 3, R. 9 W., principal meridian. The station is about 275 meters due west of a cemetery.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333.

Maida (North Dakota, Cavalier County; Geodetic Survey of Canada, 1925).—About 2 miles west and 2 miles south of Maida, in NW¼ sec. 2, T. 163 N., R. 60 W., fifth principal meridian; on a very prominent knoll. Station mark: A standard U. S. Coast and Geodetic Survey station mark; see page 333.

Cavers (North Dakota, Cavalier County; Geodetic Survey of Canada, 1925).—About 4 miles east and one-half mile south of the town of Hannah. The station is in sec. 12, T. 163 N., R. 62 W., fifth principal meridian, and about 30 meters east of a barn.

Station mark: A standard U. S. Coast and Geodetic Survey station mark; see page 333.

Kaleida (Manitoba, Lisgar District; Geodetic Survey of Canada, 1925).—About three-fourths mile west and three-fourths mile south of the town of Kaleida. The station is in SW¼ sec. 16, T. 2, R. 8 W., principal meridian. It is about 375 meters east of the southwest corner and just inside the south boundary of the section.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333.

Darlingford (Manitoba, Lisgar District; Geodetic Survey of Canada, 1925).—In SW¼ sec. 29, T. 3, R. 7 W., principal meridian. The station is about 135 meters north of the south boundary of the section.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333. The reference mark is a Dominion Lands Survey post at the northeast corner of sec. 19, T. 3, R. 7 W., 332.54 meters from the station in azimuth 53°08′10″.

Numedahl (Manitoba, Lisgar District; Geodetic Survey of Canada,1925).—In SW¼ sec. 7, T. 1, R. 5 W. principal meridian. The station is on a knoll about 180 meters northwest of a farmhouse.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333.

North Star (Manitoba, Lisgar District; Geodetic Survey of Canada, 1925).—In SW¼ sec. 5, T. 2, R. 6 W., principal meridian. The station is on a small scrub-covered knoll about 25 meters west of the east boundary of the quarter section and 180 meters north of its southern boundary.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333.

Morden (Manitoba, Lisgar District; Geodetic Survey of Canada, 1925).—Beside the power line from Winnipeg and 4 miles due east of the town of Morden. The station is in SW¼ sec. 12, T. 3, R. 5 W., principal meridian.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333. One reference mark is an astronomic pier about 3 meters west of the station. A second reference mark is a Dominion Lands Survey post at the northeast corner of sec. 2, T. 3, R. 5 W., 392.736 meters from the station in azimuth 83°51′25″.

Plum Coulee (Manitoba, Lisgar District; Geodetic Survey of Canada, 1925).—In NE¼ sec. 23, T. 2, R. 3 W., principal meridian; about 45 meters north-northwest of a farm house.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333. The reference mark is a reestablished Dominion Lands Survey post at the center of the east side of the above section. This reference mark as reestablished is probably within 3 feet of its correct position. It is 161.96 meters from the station in azimuth 303°54′59″.

Walhalla (North Dakota, Pembina County; Geodetic Survey of Canada, 1925).—On the summit of a heavily wooded ridge about 1 mile southeast of the town of Walhalla, in NE¼ sec. 33, T. 163 N., R. 56 W., fifth principal meridian. The station may be reached by following a road from Walhalla which leads east along the railway tracks. This road forks twice and in each case the right fork should be followed. After passing the second fork there is a long hill to climb. The station is about 70 meters southeast of the point where the road reaches the top of the hill.

Station mark: A standard U. S. Coast and Geodetic Survey station mark; see page 333.

Neche (North Dakota, Pembina County; Geodetic Survey of Canada, 1925).—In NE¼ sec. 31, T. 164 N., R. 53 W., fifth principal meridian; in a wooded pasture lot about 270 meters north and one-half mile east of the town of Neche, and about 15 meters south of the north boundary of the section.

Station mark: A standard U. S. Coast and Geodetic Survey station mark; see page 333.

Altona (Manitoba, Lisgar District; Geodetic Survey of Canada, 1925).—One mile north and two miles east of the town of Altona. The station is in the southeast corner of SE¼ sec. 15, T. 2, R. 1 W., principal meridian. There is one farmhouse 70 meters north and a second 90 meters south of the station.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333. The reference mark is a fence post at the northeast corner of sec. 10, T. 2, R. 1 W., 128.6 meters from the station in azimuth 292°36′37′′.

Pembina (North Dakota, Pembina County; Geodetic Survey of Canada, 1925).—In the southwest corner of SW¼ sec. 6, T. 163 N., R. 51 W., fifth principal meridian; 2 miles due west of the town of Pembina. The station is in a small pasture field about 180 meters west of some farm buildings.

Station mark: A standard U. S. Coast and Geodetic Survey station mark; see page 333.

Letellier (Manitoba, Provencher District; Geodetic Survey of Canada, 1925).—In the southwest corner of River Lot 121, of the old Red River Survey. Sec. 17, T. 2, R. 2 E., principal meridian, is just west of this lot. Station mark: A standard Geodetic Survey of Canada station mark; see page 333. The reference mark is a

Dominion Lands Survey post at the southwest corner of the above lot, 150.82 meters from the station in azimuth 87°28′35″.

Ridgeville (Manitoba, Provencher District; Geodetic Survey of Canada, 1924).—On the right-of-way of the Canadian National Railway at mileage 59.6 from South Junction, opposite the point of tangency of the first curve west of Tolstoi station, 19.79 meters north of the south rail.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333.

States (Manitoba, Provencher District; Minnesota, Kittson County; U. S. Coast and Geodetic Survey, 1907; Geodetic Survey of Canada, 1923).—On the International Boundary just east of Monument 837, 4½ miles east of Red River. The station is only a few feet east of the west side of sec. 27, T. 164 N., R. 50 W., fifth principal meridian.

Station mark: The point of a sixtypenny wire nail set in a concrete-filled iron pipe, 2 inches in diameter and 2 feet long, set in concrete. A like mark is placed underneath. A 6-inch layer of sand separates the surface and subsurface marks. There are two reference marks: the first is International Boundary Monument 837, 109.68 meters from the station in azimuth 90°12′04″; the second is a sixtypenny wire nail set in a concrete-filled iron pipe, 2 inches in diameter and 2 feet long set in concrete, 21.871 meters from the station in azimuth 270°00′51″.

Humboldt (Minnesota, Kittson County; Geodetic Survey of Canada, 1923; U. S. Coast and Geodetic Survey, 1935).—Close to the site of former U. S. C. & G. S. station "Hill", which was destroyed and is now superseded by "Humboldt." The station is 5 miles west of Northcote, on the Great Northern Railway, in the southwest corner of SE½ sec. 15, T. 162 N., R. 50 W., fifth principal meridian. It is in Hill township, on land belonging to Henry Nolte, one-half mile southwest of his house.

Station mark: A standard U. S. C. & G. S. station mark, the surface mark of which projects about 24 inches above ground.

Canada (Manitoba, Provencher District; Minnesota, Kittson County; U. S. Coast and Geodetic Survey, 1907; Geodetic Survey of Canada, 1923; 1935).—On the International Boundary just west of Monument 848, 15 miles east of Red River. The station is a few feet west of the east side of sec. 29, T. 164 N., R. 48 W., principal meridian.

Station mark: The point of a sixtypenny wire nail set in a concrete-filled terra-cotta pipe 18 inches long set in concrete. A like mark is placed underneath. A 6-inch layer of sand separates the surface and subsurface marks. There are two reference marks: the first is International Boundary Monument 848, 25.28 meters from the station in azimuth 270°03′21′′; the second is a sixtypenny wire nail set in a concrete-filled terra-cotta pipe, 2 feet long, set in concrete, 22.065 meters from the station in azimuth 90°15′18′′.

Tolstoi (Manitoba, Provencher District; Geodetic Survey of Canada, 1924).—On the right-of-way of the Canadian National Railway at mileage 51.7 from South Junction, 46.54 meters east of the center of Tolstoi railway station and 5.37 meters south of the south rail.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333.

Stuartburn (Manitoba, Provencher District; Geodetic Survey of Canada, 1924).—On the right-of-way of the Canadian National Railway at mileage 47.38 from South Junction, at the point of intersection of the tangents of the first curve west of Stuartburn station, 2,112.88 meters west of the center of Stuartburn railway station. Station mark: A nail in a wooden post.

Vita (Manitoba, Provencher District; Geodetic Survey of Canada, 1924).—On the right-of-way of the Canadian National Railway at mileage 41.8 from South Junction, at the point of intersection of the tangents of the first curve west of Vita railway station and 5,000 meters west of the center of the telegraph office at Vita station.

Station mark: A nail in a wooden post.

Read (Manitoba, Provencher District; Geodetic Survey of Canada, 1924).—On the right-of-way of the Canadian National Railway at mileage 37.65 from South Junction, 1,692.6 meters east of the center of the telegraph office at Vita station and 5.44 meters south of the north rail.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333.

Ingram (Manitoba, Provencher District; Geodetic Survey of Canada, 1924).—On the right-of-way of the Canadian National Railway at mileage 35.51 from South Junction, 5,569.6 meters west of the center of Caliento station, and 4.29 meters south of the north rail.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333.

Caliento (Manitoba, Provencher District; Geodetic Survey of Canada, 1924).—On the right-of-way of the Canadian National Railway at mileage 32.96 from South Junction, 338.7 meters east of Caliento station and 9.903 meters north of the north rail.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333.

Menisino (Manitoba, Provencher District; Geodetic Survey of Canada, 1924).—On the right-of-way of the Canadian National Railway at mileage 18.5 from South Junction, 272.6 meters west of the center of Menisino station, and 1.99 meters south of the south rail.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333.

Piney (Manitoba, Provencher District; C. H. Sinclair, 1912; Geodetic Survey of Canada, 1924).—On the most southern projection of a high ridge about 2 miles east of Menisino, overlooking lowlands to the east, south and west; about one-fourth mile north of the Canadian National Railway and 11.3 meters north of the center of the old ridge road.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333.

Fast (Manitoba, Provencher District; Geodetic Survey of Canada, 1924).—On the right-of-way of the Canadian National Railway at mileage 13.4 from South Junction, 2.6 miles west of Piney station, 188.5 meters west of the beginning of the first curve west of Piney station, on the line of tangent produced.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333.

McQuade (Manitoba, Provencher District; Geodetic Survey of Canada, 1924).—On the right-of-way of the Canadian National Railway in the Piney yards at mileage 10.94 from South Junction, 148.68 meters west of the center of the telegraph office at Piney station and 3.396 meters south of the north rail.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333.

Slow (Manitoba, Provencher District; Geodetic Survey of Canada, 1924).—On the right-of-way of the Canadian National Railway at mileage 7.4 from South Junction, 149.5 meters west of the beginning of the curve at the end of the Guilbault-Slow tangent.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333.

Guilbault (Manitoba, Provencher District; Geodetic Survey of Canada, 1924).—North of the right-of-way of the Canadian National Railway at mileage 5.3 from South Junction, in line with the tangent of the south rail, 2,537 meters west of the beginning of the first curve west of South Junction and 877 meters west of the northeast corner of sec. 14, T. 1, R. 12 E., principal meridian.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333.

South Junction (Manitoba, Provencher District; Geodetic Survey of Canada, 1924).—On the right-of-way of the Canadian National Railway at mileage 63.5 from Rainy River, between the tracks of the Winnipeg-Fort Frances line and the branch line to Emerson; 106.77 meters northwest of the point of junction switch and 7.37 meters southwest of the northeast rail of the main line.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333.

Swamp (Manitoba, Provencher District; Geodetic Survey of Canada, 1924).—South of the right-of-way of the Canadian National Railway, at mileage 62.2 from Rainy River; at the point of intersection of the tangents of the first curve southeast of South Junction; south of the rails, 350 meters southeast of the beginning of the curve.

Station mark: A nail in a wooden post.

Tod (Manitoba, Provencher District; Geodetic Survey of Canada, 1924).—South of the right-of-way of the Canadian National Railway, at mileage 60.35 from Rainy River; at the point of intersection of the lines "Tod-Soft" and "Tod-Swamp"; on the second curve southeast of South Junction, 150 meters from the beginning of the curve of the northeast rail.

Station mark: A nail in a wooden post.

Soft (Manitoba, Provencher District; Geodetic Survey of Canada, 1924).—North of the right-of-way of the Canadian National Railway, at mileage 59.8 from Rainy River; at the point of intersection of the tangents

of the second curve northwest of Sprague station, 250 meters northwest of the beginning of the curve of the south rail.

Station mark: A nail in a wooden post.

Sprague (Manitoba, Provencher District; Geodetic Survey of Canada, 1924).—On the right-of-way of the Canadian National Railway at mileage 58.1 from Rainy River, one-half mile northwest of Sprague station; 126.05 meters northwest of mile post 58 and 150 meters northwest of the beginning of the first curve northwest of Sprague station, on the line of the north rail produced.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333.

Rita (Manitoba, Provencher District; Geodetic Survey of Canada, 1924).—On the right-of-way of the Canadian National Railway, at mileage 54.6 from Rainy River; about 3 miles southeast of Sprague station, 960.1 meters northwest of mile post 54, and 9.907 meters northeast of the northeast rail.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333.

Middleboro (Manitoba, Provencher District; Geodetic Survey of Canada, 1924).—On the right-of-way of the Canadian National Railway, at mileage 48.4 from Rainy River; just southeast of Middlebro station and 9.45 meters southwest of the northeast rail.

Station mark: A standard Geodetic Survey of Canada station mark; see page 333.

Muskeg (Manitoba, Provencher District; Geodetic Survey of Canada, 1924).—Northeast of the right-of-way of the Canadian National Railway, 1½ miles from the point where the railway crosses the International Boundary; at the point of intersection of the tangents of the first curve northwest of that point, and 450 meters northwest of the beginning of the curve.

Station mark: A nail in a wooden post.

Warroad North Base Boundary Monument 909 (Manitoba, Provencher District; Minnesota, Roseau County; C. H. Sinclair, 1912; Geodetic Survey of Canada, 1924).—On the International Boundary at the crossing of the Canadian National Railway about 4 miles west of where the boundary intersects Lake of the Woods. The station is on the east side of the railroad track.

Station mark: A 5-foot cast-iron post set in a concrete base. The mark is in unstable soil and was found out of plumb in 1915. It was straightened up but was again found out of plumb in 1917. It was straightened up once more and additional concrete placed around the base, making the base 5 feet square and 2½ feet deep, resting on clay bottom. The subsurface mark is a ¾-inch bolt set in concrete, 4 inches below the bottom of the base. An 85-foot tower was built over the station, its seven legs being set in concrete foundations 3 feet deep.

Warroad South Base (Minnesota, Roseau County; C. H. Sinclair 1912; U. S. Coast and Geodetic Survey, 1923).—About 1 mile north of Warroad, Minnesota, on the east side of the Canadian National Railway, 700 meters north of the Great Northern Railway crossing. The station is 14.575 meters east, at right angles, from the east rail of the track.

Station mark: A bronze disk marked "U. S. & C. B. S.", set in a block of concrete 2 feet square and 2½ feet deep, with the top a little above the surface of the ground. The subsurface mark is a bronze disk set in concrete 2½ feet underground; under this is another concrete block with a cross in its top surface. A cross cut in the top of a concrete post 8 by 8 by 18 inches, set flush with the ground, is 26.622 meters west of the station. Another like mark is 3.885 meters west of the station. Both reference marks are inside the railway right-of-way fences, one on either side of the track. A 55-foot tower was used at this station.

Thunder (Manitoba, Provencher District; Jesse Hill, 1917; U. S. Coast and Geodetic Survey, 1923).—
On the west side of Lake of the Woods, about 1,300 meters northwest of Buffalo Point and about 1,100 meters north of the International Boundary line. The station is on a sandy ridge about 10 meters above the lake level. It may be reached by a trail from the Indian houses on Buffalo Point.

Station mark: A bronze disk set in concrete. A 65-foot tower was built over the station for observing.

West Willow (Minnesota, Roseau County; Jesse Hill, 1917).—On the south shore of Lake of the Woods, about 1¼ miles west of the mouth of Willow Creek and in the eastern part of fractional sec. 33, T. 163 N., R. 35 W., fifth principal meridian. The station is on a sand bar at the lake shore and is backed by a swamp which extends a half mile inland.

Station mark: A bronze disk set in a concrete block 2 feet square and 3 feet deep. A 35-foot tower was used for observing, and the legs of the tower were set in concrete.

Stoney (Minnesota, Lake of the Woods County; C. H. Sinclair, 1913; 1917).—On the north side of Lake of the Woods, on Stony Point. The station is about 300 meters southeast of the shore of Sand Point Bay, which lies south of the mouth of Stony Creek. It is in the southwest corner of sec. 35, T. 166 N., R. 35 W., fifth principal meridian. It is on the first rise of ground from the muskeg as approached from the south or west.

Station mark: A bronze disk marked "U. S. & C. B. S." set in a concrete block flush with the ground. A 75-foot tower was used for observing.

GEORGIA STRAIT TO LAKE OF THE WOODS, POINTS SUPPLEMENTARY TO FIRST-ORDER SCHEME

Lake View (British Columbia, Yale District; E. C. Barnard, 1904; U. S. Coast and Geodetic Survey, 1925; International Boundary Commission, 1935).—On a high, bare mountain summit about 3 miles north of the International Boundary, about 3½ miles northeast of Cathedral Peak. The east fork of the Ashnola River heads to the south of this mountain and runs around the east base of it.

Station mark: An aluminum station-mark disk marked "U. S. & C. B.", set in solid rock, with a cairn built over it.

Snowy (British Columbia, Yale District; E. C. Barnard, 1904; U. S. Coast and Geodetic Survey, 1925; International Boundary Commission, 1935).—On the highest point of a bold, high mountain on the north side of the headwaters of Snehumption Creek, a small stream that empties into the Similkameen River a short distance north of the International Boundary. It is on the same ridge and about 6 miles northeast of Horseshoe Pass. Station mark: An aluminum disk marked "U. S. & C. B.", set in solid rock, over which is a cairr.

Goat Peak Lookout (Washington, Okanogan County; U. S. Coast and Geodetic Survey, 1925).—On the summit of Goat Peak about 15 miles northwest of Winthrop, and about 3 miles north of Mazama. It is reached by road from Winthrop, thence 12 miles to Mazama, and thence following Forest Service trail and telephone line up the ridge to the peak. There is a standard Region-6 U. S. Forest Service lookout house with a peaked cupola on the summit of the peak. The station was not occupied.

Station mark: Peak of the cupola. No other station mark was set in 1925 but the Forest Service states it intends to set a Coast and Geodetic Survey standard bronze-disk station mark in the ledge rock under the center of the cupola and under the floor of the house.

Tower Mountain (Washington, Okanogan County; U. S. Coast and Geodetic Survey, 1925).—On the main summit of the Cascade Range between the heads of Early Winters Creek and the West Fork of Methow River, and near the summit of Tower Mountain. The mountain is difficult to scale and was covered with snow in June 1925, when the station was marked. The summit could not be reached at that time. The station was not occupied.

Station mark: A standard U. S. C. & G. S. bronze-disk station mark, set in a drill hole in solid rock, over which a cairn 3 feet in diameter and 5 feet high was built. The station mark is on a point of the ridge about 185 meters southeast of and at an elevation of about 90 meters below the highest point.

North Twenty Mile Lookout (Washington, Okanogan County; U. S. Coast and Geodetic Survey, 1925).—On the summit of North Twenty Mile Peak about 20 miles northeast of Winthrop, Washington. It may be reached from Winthrop by road 18 miles up the Chewack River, thence following the Forest Service trail and telephone line up Twenty Mile Creek to the station. A standard Region-6 U. S. Forest Service lookout house with peaked cupola stands on the summit of the peak. The station was not occupied.

Station mark: The apex of the cupola of the lookout house. No Coast and Geodetic Survey bronze-disk station mark was set at the time but the Forest Service states that one will be set in the ledge under the floor of the house, directly under the center of the cupola. A bronze disk of the U. S. Forest Service, lettered "U. S. Forest Service, Department of Agriculture", was set in a boulder about 6 feet long by 3 feet high, in azimuth 191°46′, 49.49 meters from the center of the cupola as projected to the ground.

Muckamuck Lookout (Washington, Okanogan County; U. S. Coast and Geodetic Survey, 1925).—On the summit of Muckamuck Mountain, about 6 miles northwest of Conconully, Washington. The station may be reached from Conconully by road and Forest Service trail. On the summit of the mountain is a standard Region 6 U. S. Forest Service lookout house with peaked cupola. The station was not occupied.

Station mark: Peak of the cupola of the lookout house. A standard U. S. C. & G. S. bronze-disk station mark set in the floor of the lookout house directly under the center of the cupola.

Bonaparte (Washington, Okanogan County; U. S. Geological Survey, 1889; U. S. Coast and Geodetic Survey, 1925).—On the conspicuous mountain by that name. The station is on the highest point at an approximate elevation of 7,280 feet. A Forest Service lookout observatory, a frame building, 14 by 14 feet, elevated 16 feet above the ground, stands near the station.

Station mark: U. S. G. S. copper-disk station mark set in rock. The center of the old tower is 7.16 meters from the station in azimuth 45°38′.

White (Washington, Ferry County; C. H. Sinclair, 1904; U. S. Coast and Geodetic Survey, 1925; International Boundary Commission, 1930).—On the summit of White Mountain, about 4 miles southeast of Midway, British Columbia, and one mile south of the International Boundary.

Station mark: The original station mark was a drill hole in outcropping bedrock. In 1925 a standard U. S. C. & G. S. bronze-disk station mark was set in the drill hole.

Paris (British Columbia, Yale District; C. H. Sinclair, 1904; U. S. Coast and Geodetic Survey, 1925; International Boundary Commission, 1930).—On the summit of a bare knoll on the highest part of a high, timbered

ridge, to the east of the road and about midway between No. 4 Mine and Paris Mine. The station is about 7 miles east of Midway, British Columbia, and about 8 miles west of Grand Forks, British Columbia.

Station mark: An aluminum-disk station mark stamped "U. S. & C. B." set in the outcropping bedrock on the highest point of the knoll. A Canadian mineral-survey station is about 2 meters south of the station.

Copper Butte (Washington, Ferry County; U. S. Coast and Geodetic Survey, 1925).—On the summit of Copper Butte, in the Colville National Forest, about 10 miles by road and 6 miles by trail northeast of Republic, Washington. The U. S. Forest Service has a lookout house 12 by 12 feet square, surmounted by a cupola 6 feet square on the summit of the peak. The station was not occupied.

Station mark: The apex of the cupola. The station is further marked by a U. S. C. & G. S. standard bronze-disk station mark set in a block of concrete flush with the ground, from which the northeast corner of the lookout house bears south 3° west, 4.17 meters distant; the northwest corner of the lookout house bears south 43° west, 5.87 meters distant; the middle turnbuckle of the northwest guy wire bears south 66° west, 6.34 meters distant; and the northeast lightning wire, where it enters the ground, bears north 47° east, 22.53 meters distant.

Lake (British Columbia, Kootenay West District; Howell Bigger, 1905; U. S. Coast and Geodetic Survey, 1925; International Boundary Commission, 1934).—On the summit of Lake Mountain, about 3 miles south-bywest of Trail, British Columbia, and about 1½ miles west of Violin Lake which can be seen from the summit of the mountain.

Station mark: In 1925 the U. S. Coast and Geodetic Survey found a cairn marking the old station and drove an iron pin in the center of it. They then set a standard Geodetic Survey of Canada bronze-disk station mark in the outcropping bed rock 3.215 meters from the original station mark in azimuth 57°49′. In 1930 the original station mark could not be found, but the bronze disk was recovered. The published position is that of the bronze disk

Beaver (British Columbia, Kootenay West District; U. S. Coast and Geodetic Survey, 1925; International Boundary Commission, 1934).—On the south end of the range of mountains lying north of the International Boundary and east of the Columbia River and known as the Gold Range. It is on a bare summit at the extreme south end of the ridge. The station is not on Beaver Mountain, but is about 5 miles southeast of it. It is about 2 miles south of station "Kelly" on the same ridge.

Station mark: A standard Geodetic Survey of Canada bronze-disk station mark set in the rock outcrop. There are no references. International Boundary Commission station "Beaver, 1905", which was within a few feet of this station has been lost and no mark of it remains.

Creston (British Columbia, Kootenay East District; U. S. Coast and Geodetic Survey, 1925).—At Creston, British Columbia, about 275 meters west of the Canadian Pacific Railway station, 12 meters south of the center line of Fourth Street, 1.2 meters west of the A. E. French building, and opposite the Creston Hotel.

Station mark: A standard Geodetic Survey of Canada bronze-disk station mark set in a square block of concrete. The subsurface mark is a like bronze disk set in a square block of concrete 3 feet underground. The reference mark is an International Boundary Commission bench mark, a standard iron pipe with a bronze cap, marked "United States Bench Mark" set near the steps of the Creston Hotel, 21.289 meters from the station in azimuth 170°20′19″.

Gateway South Base (Montana, Lincoln County; C. H. Sinclair, 1903; U. S. Coast and Geodetic Survey, 1925).—About 1¼ miles south of Gateway, Montana, 36.2 meters west of the west rail of the Great Northern Railway, and about 35 meters north of an old house. The highway is on the east side of the railway and the railway is in a rather deep cut at this place.

Station mark: The subsurface mark is the center of the neck of a bottle set in concrete about 4 feet underground. The surface mark is a copper bolt with a cross cut in it set in the top of a granite post, 6 by 6 by 48 inches, the upper 6 inches dressed. The post is set in the ground to a depth of 40 inches, leaving about 8 inches projecting above the surface. The letters "U. S. C. B." are cut in the corners of the top of the post. A bronze bench-mark disk stamped "2362 feet, datum G. N." is set in the post 0.064 meter north of the station-mark bolt.

Galbreath (Montana, Glacier County; U. S. Geological Survey; International Boundary Commission, 1909; U. S. Coast and Geodetic Survey, 1923).—On the highest point of the east end of the ridge between the Galbreath Basin and the North Fork of Milk River and about one-half mile west of a low saddle in the ridge. The station is about 5 miles south of the International Boundary and about the same distance southwest of the United States Customhouse. It is 1½ miles south of the U. S. Reclamation Service canal and is near the quarter-section corner on the south side of sec. 25, T. 37 N., R. 13 W., principal meridian.

Station mark: An aluminum bolt set in a large granite boulder flush with the ground.

Stack (Montana, Glacier County; C. H. Sinclair, 1909; U. S. Coast and Geodetic Survey, 1923).—On a rolling ridge between the North Fork of Milk River and the International Boundary, about 2½ miles south of Monument 298, and in sec. 14, T. 37 N., R. 12 W., principal meridian, near the quarter corner on the east side of the section. The station is on the extreme northern part of the ridge and overlooks the Galbreath Basin.

Station mark: A drill hole in a granite boulder flush with the ground. An arrow, cut on a small outcropping boulder, and pointing toward the station, is 12.80 meters from the station in azimuth 18°03′02′′. A similar mark is 12.40 meters from the station in azimuth 200°53′10′′. A third arrow pointing toward the station is cut on the nearest of three large boulders 45 paces west-southwest of the station.

G. L. O. No. 53 (Montana, Glacier County; U. S. Coast and Geodetic Survey, 1923).—About 9 miles west and 22 miles north of Browning, Montana, 4 miles southeast of Duck Lake, about 1½ miles north of the north fork of the North Fork of Milk River, 1½ miles west of the Davis ranch, and on land owned by Molly Davis. The station is the quarter-section corner between secs. 25 and 30, T. 36 N., Rs. 12 and 13 W., principal meridian.

Station mark: U. S. Land Office bronze disk, stamped with the numbers of the sections and the designation of the corner, set in a boulder with the top 6 inches below the surface of the ground. A U. S. Land Office bronze-disk reference mark is set in a boulder projecting 6 inches above the ground 53.525 meters from the station.

G. L. O. No. 52 (Montana, Glacier County; U. S. Coast and Geodetic Survey, 1922).—About 200 meters southwest of station "Mussetter." See description of "Mussetter."

Station mark: U. S. Land Office bronze disk marking the standard quarter corner on the south side of sec. 34, T. 37 N., R. 11 W., principal meridian. The disk is inscribed "S. C. ¼ S. 34, 1923", and is set in the top of a concrete block 24 by 24 by 36 inches in size placed with its top 4 inches underground. A U. S. Land Office reference mark was later set 12.28 meters from the station.

G. L. O. No. 51 (Montana, Glacier County; U. S. Coast and Geodetic Survey, 1922).—On the International Boundary about 40 miles west of Sweetgrass, Montana, and about 265 meters east of Monument 306. The station is the closing corner of sec. 1, T. 37 N., R. 10 W., and sec. 6, T. 37 N., R. 9 W., principal meridian.

Station mark: U. S. Land Office bronze disk, inscribed with the section, township, and range numbers, and set in a concrete block 24 inches in diameter and 36 inches deep, its top flush with the surface of the ground. Two U. S. Land Office bronze-disk reference marks are set in concrete blocks similar to the station mark but projecting 6 inches above the ground. The first is 16.072 meters from the station in azimuth 310°17′57″. The second is 19.482 meters from the station in azimuth 52°22′54″.

G. L. O. No. 50 (Montana, Glacier County; U. S. Coast and Geodetic Survey, 1922).—About 35 miles west, and 6 miles south of Sweetgrass, Montana, 19 miles north and 17 miles west of Cut Bank, Montana, 3 miles east of Croffs Lake, 3 miles south of South Fork of Milk River, 4 miles north of Buffalo Lake, and 100 meters west of the Cut Bank-Milk River wagon road. The station is the standard corner of sec. 31, T. 37 N., R. 8 W., and sec. 36, T. 37 N., R. 9 W., principal meridian.

Station mark: U. S. Land Office bronze disk, inscribed with the section, township, and range numbers, set in the top of a concrete block 24 by 24 by 36 inches, projecting 6 inches above the ground. There are two reference marks set by the Land Office at a later date, one 18.14 meters from the station, and the other 20.58 meters from the station.

Bench (Alberta, Lethbridge District; C. H. Sinclair, 1910; U. S. Coast and Geodetic Survey, 1923).—On a plateau, about one-half mile northeast of Monument 309 of the International Boundary, and in SE¼ sec. 4, T. 1, R. 21 W., fourth meridian. It is about one-fourth mile west of the edge of the plateau where the terrain slopes very steeply to the southeast down to the valley of the South Fork of Milk River.

Station mark: An International Boundary Commission bronze-disk station mark set in a block of concrete.

Track (Montana, Glacier County; C. H. Sinclair, 1910; U. S. Coast and Geodetic Survey, 1923).—About 19 miles west of Sweetgrass, Montana, about one-third mile south of the International Boundary, and about three-fourths mile southeast of Monument 320. The station is on the east end of a ridge in sec. 3, T. 37 N., R. 6 W., principal meridian, and is one-half mile west of the east fence of the Blackfeet Indian Reservation. Station mark: A drill hole in the center of a large triangle cut in a granite boulder.

Headlight Butte (Montana, Glacier County; U. S. Geological Survey; U. S. Coast and Geodetic Survey, 1923).—On the highest rock of Headlight Butte, about one-half mile east of the mail road from Cut Bank, Montana, to Komer post office, Montana, about 11 miles north of Cut Bank and 9 miles south of Komer, near the center of sec. 18, T. 35 N., R. 5 W., principal meridian. Headlight Butte is conspicuous, being the only outcrop of bare rock in the vicinity. All other hills in the same vicinity are rounding and grass covered Station mark: A standard U. S. G. S. bronze-disk station mark set in solid rock.

G. L. O. No. 49 (Montana, Toole County; U. S. Coast and Geodetic Survey, 1922).—About 10 miles west and 6 miles south of Sweetgrass, Montana, 1½ miles north and one-half mile west of Demers post office at Fitzpatric Lake. The station is on the north slope of a low ridge having a generally east-and-west trend. It is the standard corner of sec. 36, T. 37 N., R. 5 W., and sec. 31, T. 37 N., R. 4 W., principal meridian.

Station mark: U. S. Land Office bronze disk set in a boulder 5 inches below the surface of the ground and inscribed with the section, township, and range numbers. Two U. S. Land Office bronze-disk reference marks are set in boulders projecting 6 inches above the ground. Reference mark No. 1 is 207.353 meters from

the station in azimuth 121°59'58". Reference mark No. 2 is 17.142 meters from the station in azimuth 244°17′56". Reference mark No. 1 was occupied as an eccentric station.

G. L. O. No. 48 (Montana, Toole County; U. S. Coast and Geodetic Survey, 1923).—The quarter-section corner for secs. 21 and 28, T. 36 N., R. 4 W., principal meridian. It is about 10 miles south and 8 miles west of Sweetgrass, Montana, 13/4 miles south of Demers post office, which is at the Fitzpatric ranch on Fitzpatric Lake. The station is about 200 meters west of the McCormick ranch house, on land owned and occupied by Mrs. Martha McCormick, and is about 210 meters west of triangulation station "McCormick."

Station mark: A standard U. S. Land Office bronze disk, marked with the numbers of the corner and the date "1923", cemented in a granite boulder 30 by 14 by 12 inches in size and placed 4 inches underground. Over this is placed a granite boulder, 14 by 6 by 6 inches in size, marked "\"/4" on the north face and witnessed by a mound of stone to the north. The reference mark, a standard bronze disk, with the arrow pointing toward the station, and stamped "Reference No. 1, 1923", is set in a granite boulder in place having an exposed surface of 20 by 36 inches, 4 inches above the surface of the ground. The reference mark is 11.40 meters from the station in azimuth 7°57′34′′.

Tennant (Alberta, Lethbridge District; J. J. McArthur, 1908; U. S. Coast and Geodetic Survey, 1923).-On the highest point of an east-and-west ridge about 1½ miles north-by-west of Sweetgrass, Montana, and about one-fourth mile north of the Canadian Pacific Railway. The station is in a pasture and is on the highest point in the immediate vicinity.

Station mark: An International Boundary Commission bronze-disk station mark set in a boulder.

Moberly (Montana, Toole County; C. H. Sinclair, 1908; U. S. Coast and Geodetic Survey, 1923).—On the highest point on the north end of a ridge 11/2 miles south of Sweetgrass, Montana, and near the center of sec. 11, T. 37 N., R. 3 W., principal meridian.

Station mark: An International Boundary Commission bronze-disk station mark set in a rock.

G. L. O. No. 33 (Montana, Liberty County; U. S. Coast and Geodetic Survey, 1923).—The quarter-section

corner between secs. 25 and 30, T. 33 N., Rs. 7 and 8 E., principal meridian. Station mark: U. S. Land Office brass disk, marked "¼, S 25, S 30, 1923", set in concrete 6 inches underground. Over the station mark is a granite boulder 14 by 10 by 8 inches in size, marked "\"4" on the west face. The reference mark is a brass disk, bearing an arrow pointing toward the station, and the inscription "Reference 1923", set in concrete 6 inches above the surface of the ground, 11.92 meters from the station in azimuth 90°40'42".

Sweetgrass (Montana, Liberty County; U. S. Coast and Geodetic Survey, 1923).—On the top of the highest and most northeastern of the Sweetgrass Hills. This mountain culminates in a double peak, and the station is on the northern and slightly higher of the two peaks. Triangulation station "Hill" is located on the southern peak of this mountain. This station "Sweetgrass" is said to be in the approximate position of a U. S. Geological Survey station "Sweetgrass", but no actual tie between the two stations is recorded.

Station mark: A standard U. S. C. & G. S. bronze-disk station mark wedged in a drill hole in a boulder. The subsurface mark is a copper bolt set with cement in bedrock. Reference mark No. 1 is a standard U. S. C. & G. S. bronze-disk reference mark, with the arrow pointing toward the station, set in concrete in a depression in outcropping bedrock, 10.50 meters from the station in azimuth 64° magnetic. Reference mark No. 2 is a like bronze disk set in the same manner, 9.45 meters from the station in azimuth 112° magnetic.

Chester (Montana, Liberty County; J. J. McArthur, 1908; U. S. Coast and Geodetic Survey, 1923). — On the noticeably highest point of an east-and-west ridge, about 7¼ miles due south of Monument 368 of the International Boundary, 5 miles north and 6 miles west of the Alma, Montana, post office. The station is near the middle of the south side of SW1/4 sec. 12, T. 36 N., R. 6 E., principal meridian, and is about 25 meters north of the section-line road.

Station mark: The original mark was an International Boundary Commission bronze-disk station mark set in a boulder. In 1923 this disk was reset in the top of a square post of concrete, its position being held. A standard U. S. C. & G. S. bronze-disk station mark was set in a concrete block 3 feet underground for a subsurface mark. Reference mark No. 1 is a standard U. S. C. & G. S. bronze-disk reference mark, with the arrow pointing toward the station, set in the top of a square concrete post, 330.32 meters from the station in azimuth 72°12′38″. Reference mark No. 2 is a like bronze disk set in a similar manner, 101.32 meters from the station in azimuth 357°08'04".

G. L. O. No. 34 (Montana, Liberty County; U. S. Coast and Geodetic Survey, 1923).—The corner for secs. 11, 12, 13, and 14, T. 36 N., R. 6 E., principal meridian.

Station mark: U. S. Land Office brass disk, marked with the numbers of the sections, township, and range, cemented in a drill hole in a granite boulder 32 by 16 by 16 inches in size, set 6 inches underground. Set over the station mark, and in the center of the cross-roads, is a granite boulder 14 by 8 by 6 inches in size, marked with 4 notches on the south face and with 1 notch on the east face, and witnessed by 4 pits. Reference mark No. 1 is a brass disk cemented in a sandstone boulder 26 by 16 by 14 inches in size set 4 inches above the surface of the ground, in a fence corner, 13.77 meters from the station in azimuth 315°52′27′′. Reference mark No. 2 is reference mark No. 1 for station "Chester." It is a U. S. C. & G. S. standard bronze-disk reference mark set in the top of a square concrete post in a fence corner, 14.73 meters from the station in azimuth 218°00′50′′.

Center VI (Alberta, Medicine Hat District; J. J. McArthur, 1908; U. S. Coast and Geodetic Survey, 1923).—
About midway between Monuments 366 and 367 of the International Boundary and a few meters north of the line. The station is on a small knoll about 60 meters north of a fence and 3 meters east of the Pinhorn custombouse

Station mark: The original station mark was an International Boundary Commission bronze-disk station mark set in a rock. In 1923 the station was re-marked by setting the original bronze disk in the top of a square concrete post, holding the original position of the station. A subsurface mark was placed under it consisting of a standard U. S. C. & G. S. bronze-disk triangulation mark set in a block of concrete 3 feet underground. Reference mark No. 1 is a standard U. S. C. & G. S. bronze-disk reference mark, with the arrow pointing toward the station, set in the top of a square concrete post 72.60 meters from the station in azimuth 131°14′31″. Reference mark No. 2 is a like mark set in a similar manner, 76.57 meters from the station in azimuth 51°17′16″.

Alma (Montana, Liberty County; U. S. Coast and Geodetic Survey, 1923).—About 18 miles due north of Joplin, Montana, on the main road from Joplin to Alma post office and store and near the store, on land owned by H. A. Baldwin. The station is on a high point of a broad flat ridge and is about 1 meter inside the southeast fence-corner post of sec. 2, T. 35 N., R. 7 E., principal meridian. It is said to be in the approximate position of an old station called "Alma."

Station mark: A standard U. S. C. & G. S. bronze-disk station mark set in the top of a square block of concrete. The subsurface mark is a like bronze disk set in a concerete block 3 feet underground. Two standard U. S. C. & G. S. bronze-disk reference marks, with the arrows pointing toward the station, are set in square concrete blocks. The first is 19.65 meters from the station in magnetic azimuth 68°. The second is 19.70 meters from the station in magnetic azimuth 152°.

Strode (Montana, Liberty County; U. S. Coast and Geodetic Survey, 1923).—About 3½ miles south of the International Boundary and about 1 mile east of due north of Joplin, Montana. It is in SE½ sec. 24, T. 37 N.. R. 7 E., principal meridian, about 330 meters west of the section line and road, and is on the highest point of a broad flat-topped hill.

Station mark: A standard U. S. C. & G. S. bronze-disk station mark set in a square block of concrete. The subsurface mark is a like mark set in a block of concrete 3 feet below the surface of the ground. Reference mark No. 1 is a U. S. C. & G. S. standard bronze-disk reference mark, with the arrow pointing toward the station, set in a square block of concrete, 67.62 meters from the station in azimuth 340° magnetic. Reference mark No. 2 is a like mark set in a similar manner, 245.90 meters from the station in azimuth 60° magnetic. The quarter-corner on the east side of the section is in the middle of the road 343.58 meters from the station in azimuth 255°15′09″ true.

G. L. O. No. 35 (Montana, Liberty County; U. S. Coast and Geodetic Survey, 1923).—About 3½ miles south of the International Boundary, and about 1 mile east of due north of Joplin, Montana. It is in the center of a north-and-south section-line road and marks the quarter-section corner between secs. 24 and 19, T. 37 N., Rs. 7 and 8 E., principal meridian.

Station mark: U. S. Land Office bronze disk, stamped with the section numbers 24 and 19 and the date 1923, cemented in a granite boulder 32 by 20 by 16 inches, placed 6 inches underground. Over this is placed a stone 18 by 14 by 8 inches in size with the figures "¼" cut on its west face. Triangulation station "Strode" is 343.58 meters from the station in azimuth 75°15′21′′.

G. L. O. No. 36 (Montana, Liberty County; U. S. Coast and Geodetic Survey, 1923).—The standard corner for secs. 31 and 36, T. 37 N., Rs. 8 and 9, east of the principal meridian; it is on the 9th standard parallel north and the 2nd guide meridian east. It is the center of an east-and-west road.

Station mark: A standard U. S. Land Office bronze disk marked with the numbers of the sections, townships, and ranges, and the date 1923, set in concrete 6 inches underground. The surface mark is a granite boulder 10 by 12 by 4 inches in size, marked with 6 notches to the north, east, and west, "SC" to the north, "8E" to the west, and "9E" to the east. Reference mark No. 1 is a bronze disk, with an arrow pointing toward the station, marked "Reference No. 1, 1923" set in a block of concrete 15.15 meters from the station in azimuth 136°32′05". Reference mark No. 2 is a like mark, carrying its number, and set in a similar manner 14.10 meters from the station in azimuth 217°58′56".

G. L. O. No. 37 (Montana, Hill County; U. S. Coast and Geodetic Survey, 1923).—The corner of secs. 7, 12, 13, and 18, T. 36 N., Rs. 9 and 10 E., principal meridian.

Station mark: A standard U. S. Land Office bronze disk marked with the numbers of the sections, township, ranges, and the date 1923, set in a concrete block 6 inches underground. Over this is placed a granite boulder, 10 by 10 by 16 inches in size, marked with 4 grooves on the south face and 2 grooves on the north face. Refer-

ence mark No. 1 is a standard bronze disk, with an arrow pointing toward the station, marked "Reference No. 1, 1923", set in a concrete block 6 inches above the surface of the ground, 16.54 meters from the station in azimuth 134°25′57′′. Reference mark No. 2 is a like mark inscribed with its number and set in a similar manner, 15.54 meters from the station in azimuth 227°03′28′′.

G. L. O. No. 38 (Montana, Hill County; U. S. Coast and Geodetic Survey, 1923).—The corner of secs. 1, 6, 31, and 36 Ts. 34 and 35 N., Rs. 10 and 11 E., principal meridian. It is at the center of crossroads.

Station mark: A standard U. S. Land Office bronze disk marked with the numbers of the corner and set in concrete 6 inches underground. Over this is a granite boulder, 14 by 10 by 8 inches in size, marked with 6 grooves on each of the four sides, and "35 N" on the north side, "34 N" on the south side, "10 E" on the west side, and "11 E" on the east side. Reference mark No. 1 is a bronze disk, with the arrow pointing toward the station, stamped "Reference No. 1, 1923", set in a cement block 6 inches above the ground, 13.12 meters from the station in azimuth 129°32'37". Reference mark No. 2 is a like bronze disk stamped "Reference No. 2, 1923", set in a similar manner 16.93 meters from the station in azimuth 239°29'09".

G. L. O. No. 39 (Montana, Hill County; U. S. Coast and Geodetic Survey, 1923).—The standard corner for secs. 31 and 36, T. 37 N., Rs. 12 and 13 E. of the principal meridian; on the ninth standard parallel north and on the third guide meridian east. It is at the intersection of roads bearing north, east, and west.

Station mark: A standard U. S. Land Office bronze disk stamped with the numbers of the sections, township, and ranges, and the date 1923, set in a block of concrete 6 inches underground. Over this mark is placed a granite boulder, 16 by 12 by 8 inches in size, marked with 6 grooves on the north, east, and west faces, the number "12" on the west face, the number "13" on the east face, "S C" on the south face, and the number "37" on the north face. There are two reference marks, standard bronze disks with arrow pointing toward the station and marked, respectively, "Reference No. 1, 1923" and "Reference No. 2, 1923." Reference mark No. 1 is set in a block of concrete 6 inches above the surface of the ground, 16.99 meters from the station in azimuth 230°23′58". Reference mark No. 2 is set in like manner, 571.42 meters from the station in azimuth 111°19′24".

G. L. O. No. 40 (Montana, Hill County; U. S. Coast and Geodetic Survey, 1923).—The quarter-section corner between secs. 17 and 18, T. 36 N., R. 14 E., principal meridian.

Station mark: A 1-inch iron pipe set 3 feet in the ground with its top flush with the ground and capped with a U. S. Land Office bronze disk inscribed with the numbers of the corner and the dates 1912 and 1923. One reference mark, a bronze disk with an arrow pointing toward the station and stamped "Reference, 1923", is set in a concrete block 6 inches above the surface of the ground 8.48 meters to the westward of the station.

Havre (Montana, Hill County; J. J. McArthur, 1908; U. S. Coast and Geodetic Survey, 1923).—About 3.7 miles south of the International Boundary, about 27 miles north and 19 miles west of Havre, Montana, and 1 mile northwest of the Pioneer School, District No. 67. It is in the southwest corner of SW¼ sec. 24, T. 37 N., R. 12 E., principal meridian.

Station mark: A standard U. S. C. & G. S. bronze-disk station mark set in a square block of concrete. The subsurface mark is a copper bolt set in and projecting a little above the surface of a block of concrete 3 feet underground. The reference mark is a standard U. S. C. & G. S. bronze-disk reference mark, with the arrow pointing toward the station, set in a square block of concrete 427.03 meters from the station in azimuth 197° magnetic. The southwest corner post of section 24 is about 1 meter from the reference mark.

Thibedeau (Montana, Hill County; U. S. Geological Survey; U. S. Coast and Geodetic Survey, 1923).—See station "Havre South Base."

G. L. O. No. 41 (Montana, Hill County; U. S. Coast and Geodetic Survey, 1923).—The quarter corner between secs. 22 and 23, T. 37 N., R. 16 E., principal meridian. It is about 4 miles south of the International Boundary and is nearly north of Havre, Montana.

Station mark: A standard 1-inch iron pipe capped with a U. S. Land Office bronze disk set in concrete 3 feet in the ground and projecting 4 inches above the surface of the ground. The bronze disk is stamped with the numbers of the corner and the dates 1911 and 1923. One reference mark, a bronze disk with the arrow pointing toward the station and stamped "Reference, 1923" is set in a block of concrete 6 inches above the surface of the ground, 8.86 meters from the station in azimuth 89°19'.

G. L. O. No. 42 (Montana, Hill County; U. S. Coast and Geodetic Survey, 1923).—The standard corner for secs. 31 and 36, T. 37 N., Rs. 16 and 17 E. of the principal meridian; on the ninth standard parallel north and the Yantic guide meridian.

Station mark: A standard U. S. Land Office bronze disk, marked with the numbers of the corner and the date 1923, set in concrete 6 inches underground. Over this is placed a granite boulder, 12 by 10 by 5 inches in size, marked with 6 notches on the east and west faces, and "S C 37 N" on the north face, and witnessed by three pits. Reference mark No. 1 is a bronze disk, with the arrow pointing toward the station, stamped "Reference No. 1, 1923", set in concrete flush with the ground 18.70 meters from the station in azimuth 239°47′02". Reference mark No. 2 is a like bronze disk, stamped "Reference No. 2, 1923", set in a similar manner 14.25 meters from the station in azimuth 32°29′44".

Forks (Montana, Blaine County; U. S. Geological Survey; J. J. McArthur, 1908; U. S. Coast and Geodetic Survey, 1923).—About 16 miles north and 5½ miles west of Chinook, Montana, and about one-half mile west of the North Fork of Milk River. It is in SW¼ sec. 3, T. 35 N., R. 18 E., principal meridian; in a grain field on a gentle slope which increases in elevation to the westward.

Station mark: A standard U. S. G. S. 3-inch iron pipe with bronze cap set in a block of concrete. A standard U. S. C. & G. S. bronze-disk reference mark with the arrow pointing toward the station is set in the center

of a square block of concrete 241.23 meters from the station in azimuth 141°19'17".

West Cherry (Montana, Blaine County; U. S. Geological Survey; International Boundary Commission; Geodetic Survey of Canada, 1922; U. S. Coast and Geodetic Survey, 1923).—About 19 miles north and 12 miles east of Chinook, Montana, on the top of one of the several ridges of the same height locally known as the Cherry Ridges. The station is on the more northern of two prominent hills near the northern extremity of the ridge.

Station mark: A standard U. S. G. S. brass station-mark disk fixed on top of a 3-inch iron pipe firmly

set in the ground.

G. L. O. No. 43 (Montana, Hill County; U. S. Coast and Geodetic Survey, 1923).—The standard corner of secs. 31 and 36, T. 37 N., Rs. 19 and 20 E. of the principal meridian; on the ninth standard parallel north.

Station mark: A standard U. S. Land Office bronze disk, marked with the numbers of the section, township, and ranges and the date 1923, set in concrete 6 inches underground. Over this is placed a granite boulder, 12 by 10 by 8 inches in size, marked with 6 notches and "S C 37 N" on the north face, 6 notches and "19" on the west face, and 6 notches and "20" on the east face; there are three witness pits. Reference mark No. 1 (used as an eccentric station) is a standard bronze disk, with the arrow pointing toward the station, stamped "Reference No. 1, 1923", set in concrete 94.46 meters from the station in azimuth 51°08'56". Reference mark No. 2 is a like bronze disk, stamped "Reference No. 2, 1923", set in concrete 11.70 meters from the station in a southeasterly direction. From the information given, the azimuth may be either 316°22'42" or 339°51'02".

G. L. O. No. 44 (Montana, Hill County; U. S. Coast and Geodetic Survey, 1923).—The closing corner, on the International Boundary Line, of secs. 1 and 6, T. 37 N., Rs. 22 and 23 E., principal meridian.

Station mark: A standard U. S. Land Office bronze disk, marked with the numbers of the corner and "Canada 1923", set in a concrete block flush with the surface of the ground. Beside the mark is a granite boulder, 12 by 10 by 8 inches in size, marked "37 N" on the top, "BP" on the north side, with 6 notches on the east side, "C C" and 6 notches on the south side, and "22 E" and 6 notches on the west side. Reference mark No. 1 is a standard bronze disk, with the arrow pointing toward the station, stamped "Reference No. 1, 1923", set in a block of concrete 16.81 meters from the station in azimuth 7°29'30". Reference mark No. 2 is a U. S. G. S. bronze bench-mark disk on top of a 3-inch iron pipe firmly planted in the ground 1.625 meters from the station in azimuth 302°08'20".

Tubs (Montana, Blaine County; J. J. McArthur, 1909; Geodetic Survey of Canada, 1922).—About 5 miles south of International Boundary Monument 433, in SE¼ sec. 27, T. 37 N., R. 22 E., principal meridian. The station is on the highest part of an east-and-west ridge.

Station mark: A bronze disk set in a boulder.

S-313 (Montana, Blaine County; J. J. McArthur, 1909; Geodetic Survey of Canada, 1922).—About one-half mile south of International Boundary Monument 428, in SE¼ sec. 4, T. 37 N., R. 21 E., principal meridian. The station is on the highest spur of the hill.

Station mark: A bronze disk set in a boulder.

Rounds (Saskatchewan, Maple Creek District; J. J. McArthur, 1909; Geodetic Survey of Canada, 1922).— About 4 miles north of International Boundary Monument 433, in NE¼ sec. 24, T. 1, R. 22 W., third meridian. The station is on the noticeable high point.

Station mark: A bronze disk set in a boulder.

- G. L. O. No. 1 (Montana, Blaine County; Geodetic Survey of Canada, 1922).—The General Land Office corner of secs. 10, 11, 14, and 15, T. 36 N., R. 21 E., principal meridian.
- D. L. S. No. 1 (Saskatchewan, Maple Creek District; Geodetic Survey of Canada, 1922).—The Dominion Lands Survey post at the northeast corner of sec. 21, T. 4, R. 22 W., third meridian.
- D. L. S. No. 2 (Saskatchewan, Maple Creek District; Geodetic Survey of Canada, 1922).—The Dominion Lands Survey post at the northeast corner of sec. 34, T. 1, R. 22 W., third meridian.

Divide (Saskatchewan, Maple Creek District; Geodetic Survey of Canada, 1922).—In NW¼ sec. 35, T. 2, R. 25 W., third meridian. The station is on the highest point of the section near the west end of the plateau known as "the old man on his back", and about 1½ miles west of U. S. Coast and Geodetic Survey station "Old Man."

Station mark: A standard Geodetic Survey of Canada station mark; see page 333. The reference mark is the northeast corner of sec. 34, 304.71 meters from the station in azimuth 120°01′32″.

- D. L. S. No. 3 (Saskatchewan, Maple Creek District; Geodetic Survey of Canada, 1922).—Dominion Lands Survey post at the northeast corner of sec. 34, T. 2, R. 25 W., third meridian.
- Wylie (Saskatchewan, Maple Creek District; Geodetic Survey of Canada, 1922).—Near the center of sec. 33, T. 2, R. 24 W., third meridian; on top of the most prominent knoll in the vicinity.
- Station mark: A standard Geodetic Survey of Canada station mark; see page 333. The reference mark is a Dominion Lands Survey post at the northeast corner of the above section, 1,328.1 meters from the station in azimuth 219°22′22″.
- D. L. S. No. 4 (Saskatchewan, Maple Creek District; Geodetic Survey of Canada, 1922).—The Dominion Lands Survey post at the northeast corner of sec. 33, T. 2, R. 24 W., third meridian.
- G. L. O. No. 2 (Montana, Blaine County; Geodetic Survey of Canada, 1922).—The General Land Office corner between secs. 8, 9, 16, and 17, T. 37 N., R. 24 E., principal meridian.
- D. L. S. No. 5 (Saskatchewan, Maple Creek District; Geodetic Survey of Canada, 1922).—The Dominion Lands Survey post at the northeast corner of sec. 14, T. 3, R. 20 W., third meridian.
- D. L. S. No. 6 (Saskatchewan, Maple Creek District; Geodetic Survey of Canada, 1922).—The Dominion Lands Survey quarter-section post on the east boundary of sec. 4, T. 2, R. 19 W., third meridian.
- D. L. S. No. 7 (Saskatchewan, Maple Creek District; Geodetic Survey of Canada, 1922).—The Dominion Lands Survey post at the northeast corner of sec. 9, T. 3, R. 18 W., third meridian.
- G. L. O. No. 3 (Montana, Blaine County; Geodetic Survey of Canada, 1922).—The General Land Office quarter-section corner between secs. 17 and 20, T. 37 N., R. 26 E., principal meridian.
- D. L. S. No. 8 (Saskatchewan, Maple Creek District; Geodetic Survey of Canada, 1922).—The Dominion Lands Survey post at the northeast corner of sec. 31, T. 2, R. 16 W., third meridian.
- G. L. O. No. 4 (Montana, Blaine County; Geodetic Survey of Canada, 1922).—The General Land Office corner between secs. 27, 28, 33, and 34, T. 37 N., R. 28 E., principal meridian.
- D. L. S. No. 9 (Saskatchewan, Maple Creek District; Geodetic Survey of Canada, 1922).—The Dominion Lands Survey quarter-section post on the east boundary of sec. 4, T. 1, R. 14 W., third meridian.
- Center XV (Saskatchewan, Maple Creek District; J. J. McArthur, 1909; Geodetic Survey of Canada, 1922).—In SW¼ sec. 2, T. 1, R. 14 W., third meridian. The station is on the largest knoll in the vicinity, a short distance north of the International Boundary, and about 400 meters west of Monument 465. Station mark: A drill hole in a boulder.
- G. L. O. No. 5 (Montana, Phillips County; Geodetic Survey of Canada, 1922).—The General Land Office quarter-section corner between sec. 1, T. 37 N., R. 31 E., and sec. 6, T. 37 N., R. 32 E., principal meridian.
- T. S. B. M. No. 31 (Saskatchewan, Maple Creek District; Geodetic Survey of Canada, 1922).—Topographical Survey of Canada bench mark No. 31, east outline of range 13. This bench mark is 97.8 meters north of the southeast corner of sec. 1, T. 1, R. 13 W., third meridian.
- G. L. O. No. 6 (Montana, Phillips County; Geodetic Survey of Canada, 1923).—The General Land Office quarter-section corner between secs. 17 and 20, T. 37 N., R. 34 E., principal meridian.
- D. L. S. No. 10 (Saskatchewan, Maple Creek District; Geodetic Survey of Canada, 1923).—The Dominion Lands Survey quarter-section post on the west boundary of sec. 11, T. 4, R. 10 W., third meridian.
- D. L. S. No. 11 (Saskatchewan, Wood Mountain District; Geodetic Survey of Canada, 1923).—The Dominion Lands Survey quarter-section post on the east boundary of sec. 20, T. 2, R. 9 W., third meridian.
- D. L. S. No. 12 (Saskatchewan, Wood Mountain District; Geodetic Survey of Canada, 1923).—The Dominion Lands Survey post at the southeast corner of sec. 2, T. 3, R. 7 W., third meridian.
- G. L. O. No. 7 (Montana, Valley County; Geodetic Survey of Canada, 1923).—The General Land Office quarter-section corner between secs. 13 and 14, T. 36 N., R. 37 E., principal meridian.
- D. L. S. No. 13 (Saskatchewan, Wood Mountain District; Geodetic Survey of Canada, 1923).—The Dominion Lands Survey post at the northeast corner of sec. 33, T. 2, R. 5 W., third meridian.
- G. L. O. No. 8 (Montana, Valley County; Geodetic Survey of Canada, 1923).—The General Land Office corner mark at the southeast corner of sec. 36, T. 37 N., R. 39 E., principal meridian.
- G. L. O. No. 9 (Montana, Valley County; Geodetic Survey of Canada, 1923).—The General Land Office corner between secs. 11, 12, 13, and 14, T. 36 N., R. 41 E., principal meridian.

- D. L. S. No. 14 (Saskatchewan, Wood Mountain District; Geodetic Survey of Canada, 1923).—The Dominion Lands Survey post at the northeast corner of sec. 12, T. 2, R. 3 W., third meridian.
- D. L. S. No. 15 (Saskatchewan, Wood Mountain District; Geodetic Survey of Canada, 1923).—The Dominion Lands Survey quarter-section post on the east boundary of sec. 3, T. 3, R. 1 W., third meridian.
- G. L. O. No. 10 (Montana, Valley County; Geodetic Survey of Canada, 1923).—The General Land Office corner mark at the northeast corner of sec. 1, T. 36 N., R. 43 E., principal meridian.
- G. L. O. No. 11 (Montana, Valley County; Geodetic Survey of Canada, 1923).—The General Land Office quarter-section corner between secs. 30 and 31, T. 36 N., R. 45 E., principal meridian.
- D. L. S. No. 16 (Saskatchewan, Wood Mountain District; Geodetic Survey of Canada, 1923).—The Dominion Lands Survey post at the northeast corner of sec. 22, T. 2, R. 29 W., second meridian.
- D. L. S. No. 17 (Saskatchewan, Wood Mountain District; Geodetic Survey of Canada, 1923).—The Dominion Lands Survey quarter-section post on the east boundary of sec. 7, T. 1, R. 27 W., second meridian.
- D. L. S. No. 18 (Saskatchewan, Wood Mountain District; Geodetic Survey of Canada, 1923).—The Dominion Lands Survey quarter-section post on the north boundary of sec. 12, T. 2, R. 26 W., second meridian.
- G. L. O. No. 12 (Montana, Daniels County; Geodetic Survey of Canada, 1923).—The General Land Office quarter-section corner between secs. 14 and 23, T. 37 N., R. 49 E., principal meridian.
- G. L. O. No. 13 (Montana, Daniels County; Geodetic Survey of Canada, 1923).—The General Land Office quarter-section corner between secs. 24 and 25, T. 35 N., R. 50 E., principal meridian.

Madoc School (Montana, Daniels County; Geodetic Survey of Canada, 1923).—The school at Madoc. Station mark: The base of the flagpole.

D. L. S. No. 19 (Saskatchewan, Wood Mountain District; Geodetic Survey of Canada, 1923).—The Dominion Lands Survey quarter-section post on the east boundary of sec. 17, T. 1, R. 23 W., second meridian.

Flaxville Church (Montana, Daniels County; Geodetic Survey of Canada, 1923).—The Roman Catholic church at Flaxville.

Station mark: The center line of the spire.

Fire (Montana, Daniels County; C. H. Sinclair, 1911; Geodetic Survey of Canada, 1923).—About 1¼ miles south of International Boundary Monument 549. The station is on a ridge that tends southwesterly from the boundary. It is about one-half mile east of station "Pebble."

Station mark: Probably a bronze disk marked "U. S. & C. B. SURVEY" set in a concrete pier.

- G. L. O. No. 14 (Montana, Sheridan County; Geodetic Survey of Canada, 1923).—The General Land Office lot corner on the 49th parallel between lots 1 and 2, sec. 5, T. 37 N., R. 53 E., principal meridian.
- G. L. O. No. 15 (Montana, Sheridan County; Geodetic Survey of Canada, 1923).—The General Land Office quarter-section corner between secs. 2 and 11, T. 34 N., R. 53 E., principal meridian.
- G. L. O. No. 16 (Montana, Sheridan County; Geodetic Survey of Canada, 1923).—The General Land Office corner between secs. 23, 24, 25, and 26, T. 37 N., R. 54 E., principal meridian.

Dooley School (Montana, Sheridan County; Geodetic Survey of Canada, 1923).—The school at Dooley. Station mark: The base of the flagpole.

- D. L. S. No. 20 (Saskatchewan, Weyburn District; Geodetic Survey of Canada, 1923).—The Dominion Lands Survey post at the northeast corner of sec. 28, T. 1, R. 18 W., second meridian.
- D. L. S. No. 21 (Saskatchewan, Weyburn District; Geodetic Survey of Canada, 1923).—The Dominion Lands Survey post at the northeast corner of sec. 26, T. 1, R. 16 W., second meridian.
- D. L. S. No. 22 (Saskatchewan, Weyburn District; Geodetic Survey of Canada, 1923).—The Dominion Lands Survey quarter-section post on the north boundary of sec. 8, T. 1, R. 14 W., second meridian.
- Oslo Church (North Dakota, Divide County; Geodetic Survey of Canada, 1923).—The church near the northwest corner of sec. 8, T. 163 N., R. 102 W., fifth principal meridian.

Station mark: The center line of the spire.

Pleasant Valley Church (Montana, Sheridan County; Geodetic Survey of Canada, 1923).—The Lutheran church near the southeast corner sec. 12, T. 37 N., R. 57 E., principal meridian.

Station mark: The center line of the spire.

Cut (Montana, Sheridan County; C. H. Sinclair, 1911; Geodetic Survey of Canada, 1923).—About two-thirds mile south of International Boundary Monument 577, in the west half of sec. 4, T. 37 N., R. 57 E., principal meridian. The station is on the highest and most prominent hill in the vicinity.

Station mark: A cairn over a bronze disk marked "U. S. & C. B. SURVEY" set in concrete.

High (Saskatchewan, Weyburn District; C. H. Sinclair, 1911; Geodetic Survey of Canada, 1923).—About three-fourths mile northwest of International Boundary Monument 575, in NE¼ sec. 6, T. 1, R. 17 W., second meridian. The station is on a prominent knoll of a ridge lying in a northeast-and-southwest direction. A small dry lake lies about 100 meters north of the station and another small dry lake about 150 meters to the northeast. Station mark: A cairn over a bronze disk marked "U. S. & C. B. SURVEY" set in concrete.

Norge School (Saskatchewan, Weyburn District; Geodetic Survey of Canada, 1923).—Norge School No. 1011, in the NW¼ sec. 11, T. 1, R. 16 W., second meridian.

Station mark: The base of the flagpole.

Summit School (Saskatchewan, Weyburn District; Geodetic Survey of Canada, 1923).—The school in the NE¼ sec. 33, T. 1, R. 15 W., second meridian.

Station mark: The base of the flagpole.

G. L. O. No. 17 (North Dakota, Divide County; Geodetic Survey of Canada, 1923).—The General Land Office corner between secs. 3 and 4, T. 162 N. and secs. 33 and 34, T. 163 N., R. 101 W., fifth principal meridian.

Church No. 1 (North Dakota, Divide County; Geodetic Survey of Canada, 1923).—The Danish Lutheran church near the northwest corner sec. 12, T. 161 N., R. 103 W., fifth principal meridian.

Station mark: The center line of the spire.

Alkabo School (North Dakota, Divide County; Geodetic Survey of Canada, 1923).—The school at Alkabo. Station mark: The base of the flagpole.

G. L. O. No. 18 (North Dakota, Divide County; Geodetic Survey of Canada, 1923).—The General Land Office corner between secs. 2, 3, 10, and 11, T. 163 N., R. 101 W., fifth principal meridian.

Fortuna School (North Dakota, Divide County; Geodetic Survey of Canada, 1923).—The school at Fortuna. Station mark: The base of the flagpole.

D. L. S. No. 23 (Saskatchewan, Weyburn District; Geodetic Survey of Canada, 1923).—The Dominion Lands Survey quarter-section post on the north boundary of sec. 10, T. 1, R. 13 W., second meridian.

Colgan School (North Dakota, Divide County; Geodetic Survey of Canada, 1923).—The school at Colgan. Station mark: The base of the flagpole.

Twin Butte Church (North Dakota, Divide County; Geodetic Survey of Canada, 1923).—The church near the northwest corner of sec. 19, T. 162 N., R. 99 W., fifth principal meridian.

Station mark: The center line of the spire.

D. L. S. No. 24 (Saskatchewan, Weyburn District; Geodetic Survey of Canada, 1923).—The Dominion Lands Survey quarter-section post on the north boundary of sec. 24, T. 1, R. 12 W., second meridian.

Bromhead Church (Saskatchewan, Weyburn District; Geodetic Survey of Canada, 1923).—The Lutheran church at Bromhead.

Station mark: The center line of the spire.

Lake Qu'Appelle Church (Saskatchewan, Weyburn District; Geodetic Survey of Canada, 1923).—The church near the southwest corner of sec. 34, T. 3, R. 12 W., second meridian.

Station mark: The center line of the spire.

Church No. 2 (Saskatchewan, Weyburn District; Geodetic Survey of Canada, 1923).—The church near the southwest corner of sec. 27, T. 1, R. 12 W., second meridian.

Station mark: The center line of the spire.

G. L. O. No. 19 (North Dakota, Divide County; Geodetic Survey of Canada, 1923).—The General Land Office corner between secs. 16, 17, 20, and 21, T. 163 N., R. 98 W., fifth principal meridian.

Church No. 3 (North Dakota, Divide County; Geodetic Survey of Canada, 1923).—The church in sec. 12, T. 162 N., R. 99 W., fifth principal meridian.

Station mark: The center line of the spire.

Ambrose School (North Dakota, Divide County; Geodetic Survey of Canada, 1923).—The school at Ambrose.

Station mark: The base of the flagpole.

D. L. S. No. 25 (Saskatchewan, Assiniboia District; Geodetic Survey of Canada, 1924).—The Dominion Lands Survey post at the northeast corner of sec. 10, T. 2, R. 10 W., second meridian.

Torquay Elevator (Saskatchewan, Weyburn District; Geodetic Survey of Canada, 1924).—The middle elevator of three at Torquay. This elevator is the property of the Saskatchewan Elevator Company.

Station mark: The southwest corner of the main building.

Crosby Courthouse (North Dakota, Divide County; Geodetic Survey of Canada, 1924).—The courthouse at Crosby.

Station mark: The ball on the dome.

- D. L. S. No. 26 (Saskatchewan, Assiniboia District; Geodetic Survey of Canada, 1924).—The Dominion Lands Survey quarter-section post on the north boundary of sec. 8, T. 2, R. 7 W., second meridian.
- G. L. O. No. 20 (North Dakota, Burke County; Geodetic Survey of Canada, 1924).—The General Land Office quarter-section corner between secs. 28 and 29, T. 162 N., R. 94 W., fifth principal meridian.

Estevan Water Tank (Saskatchewan, Assiniboia District; Geodetic Survey of Canada, 1924).—The water tank at Estevan.

Station mark: The center of the tank.

G. L. O. No. 21 (North Dakota, Burke County; Geodetic Survey of Canada, 1924).—The General Land Office quarter-section corner between secs. 4 and 5, T. 163 N., R. 93 W., fifth principal meridian.

Larson Church (North Dakota, Burke County; Geodetic Survey of Canada, 1924).—The church at Larson. Station mark: The center line of the spire.

D. L. S. No. 27 (Saskatchewan, Assiniboia District; Geodetic Survey of Canada, 1924).—The Dominion Lands Survey quarter-section post on the east boundary of sec. 13, T. 1, R. 6 W., second meridian.

Estevan School (Saskatchewan, Assiniboia District; Geodetic Survey of Canada, 1924).—The Valleyview school at Estevan.

Station mark: The flagpole on the bell tower.

Bienfait School (Saskatchewan, Assiniboia District; Geodetic Survey of Canada, 1924).—The brick school-house at Bienfait.

Station mark: The flagpole on the schoolhouse.

Columbus Church (North Dakota, Burke County; Geodetic Survey of Canada, 1924).—The church at Columbus.

Station mark: The center line of the spire.

Briquet Plant Water Tank (Saskatchewan, Assiniboia District; Geodetic Survey of Canada, 1924).—The water tank at the briquet plant southeast of Bienfait.

Station mark: The center of the tank.

- D. L. S. No. 28 (Saskatchewan, Assiniboia District; Geodetic Survey of Canada, 1924).—The Dominion Lands Survey quarter-section post at the middle of the south boundary of sec. 1, T. 1, R. 5 W., second meridian.
- G. L. O. No. 22 (North Dakota, Burke County; Geodetic Survey of Canada, 1924).—The General Land Office quarter-section corner in T. 162 N. between sec. 7, R. 91 W., and sec. 12, R. 92 W., fifth principal meridian.

Lignite Church (North Dakota, Burke County; Geodetic Survey of Canada, 1924).—The Swedish church of Lignite. This church has a square tower.

Station mark: The center of the tower.

Portal Chimney (North Dakota, Burke County; Geodetic Survey of Canada, 1924).—The chimney of the Soo Railway shops at Portal.

Station mark: The center of the chimney.

G. L. O. No. 23 (North Dakota, Burke County; Geodetic Survey of Canada, 1924).—The General Land Office quarter-section corner between secs. 34 and 35, T. 163 N., R. 90 W., fifth principal meridian.

Flaxton School (North Dakota, Burke County; Geodetic Survey of Canada, 1924).—The school at Flaxton. Station mark: The base of the flagpole.

D. L. S. No. 29 (Saskatchewan, Assiniboia District; Geodetic Survey of Canada, 1924).—The Dominion Lands Survey quarter-section post on the east boundary of sec. 12, T. 1, R. 3 W., second meridian.

Frobisher Elevator (Saskatchewan, Assiniboia District; Geodetic Survey of Canada, 1924).—The eastern of three elevators at Frobisher.

Station mark: The south end of the ridge of the elevator roof.

Church No. 4 (North Dakota, Burke County; Geodetic Survey of Canada, 1924).—The church 1½ miles east and 2 miles north of Flaxton.

Station mark: The center line of the spire.

Alameda School (Saskatchewan, Assiniboia District; Geodetic Survey of Canada, 1924).—The school at Alameda.

Station mark: The center of the square tower.

D. L. S. No. 30 (Saskatchewan, Assiniboia District; Geodetic Survey of Canada, 1924).—The Dominion Lands Survey quarter-section post on the north boundary of sec. 16, T. 1., R. 1 W., second meridian.

Perella Elevator (North Dakota, Burke County; Geodetic Survey of Canada, 1924).—The Farmers elevator at Perella.

Station mark: The west end of the ridge of the elevator roof.

Church No. 5 (North Dakota, Burke County; Geodetic Survey of Canada, 1924).—The white church 9 miles east and 3 miles south of Flaxton. This church has a spire on the south end.

Station mark: The center line of the spire.

Oxbow Church (Saskatchewan, Assiniboia District; Geodetic Survey of Canada, 1924).—St. Paul Church at Oxbow.

Station mark: The center line of the spire.

G. L. O. No. 24 (North Dakota, Burke County; Geodetic Survey of Canada, 1924).—The General Land Office quarter-section corner between secs. 25 and 36, T. 163 N., R. 88 W., fifth principal meridian.

Elcott Elevator (Saskatchewan, Assiniboia District; Geodetic Survey of Canada, 1924).—The white elevator at Elcott.

Station mark: The west end of the ridge of the elevator roof.

Bowbells Water Tank (North Dakota, Burke County; Geodetic Survey of Canada, 1924).—The elevated water tank at Bowbells.

Station mark: The center of the tank.

G. L. O. No. 25 (North Dakota, Renville County; Geodetic Survey of Canada, 1924).—The General Land Office quarter-section corner between secs. 19 and 20, T. 163 N., R. 86 W., fifth principal meridian.

Church No. 6 (North Dakota, Renville County; Geodetic Survey of Canada, 1924).—The isolated church near the northwest corner of sec. 25, T. 162 N., R. 87 W., fifth principal meridian. This church has a square white tower and a tall black spire.

Station mark: The center line of the spire.

Tolley Elevator (North Dakota, Renville County; Geodetic Survey of Canada, 1924).—The middle elevator of five at Tolley.

Station mark: The middle of the ridge of the elevator roof.

- D. L. S. No. 31 (Saskatchewan, Assiniboia District; Geodetic Survey of Canada, 1924).—The Dominion Lands Survey quarter-section post on the east boundary of sec. 28, T. 1, R. 33 W., principal meridian.
- G. L. O. No. 26 (North Dakota, Renville County; Geodetic Survey of Canada, 1924).—The General Land Office quarter-section corner between secs. 1 and 2, T. 162 N., R. 85 W., fifth principal meridian.

Morse West Base School (North Dakota, Renville County; Geodetic Survey of Canada, 1924).—The school near the southwest corner of sec. 3, T. 163 N., R. 86 W., fifth principal meridian.

Station mark: The flagpole on the schoolhouse.

Sherwood Church (North Dakota, Renville County; Geodetic Survey of Canada, 1924).—St. James Church at Sherwood.

Station mark: The center line of the spire.

Carievale Elevator (Saskatchewan, Assiniboia District; Geodetic Survey of Canada, 1924).—The middle elevator of three at Carievale.

Station mark: The middle of the ridge of the elevator roof.

D. L. S. No. 32 (Saskatchewan, Assiniboia District; Geodetic Survey of Canada, 1924).—The Dominion Lands Survey post at the northeast corner of sec. 15, T. 1, R. 30 W., principal meridian.

G. L. O. No. 27 (North Dakota, Bottineau County; Geodetic Survey of Canada, 1924).—The General Land Office corner between secs. 2 and 3, T. 162 N., R. 83 W., and secs. 34 and 35, T. 163 N., R. 83 W., fifth principal meridian.

Mohall Water Tank (North Dakota, Renville County; Geodetic Survey of Canada, 1924).—The water tank at Mohall.

Station mark: The center of the tank.

D. L. S. No. 33 (Manitoba, Souris District; Geodetic Survey of Canada, 1925).—The Dominion Lands Survey quarter-section post on the east boundary of sec. 28, T. 1, R. 28 W., principal meridian.

Lyleton School (Manitoba, Souris District; Geodetic Survey of Canada, 1925).—The school at Lyleton. Station mark: The center of the belfry.

G. L. O. No. 28 (North Dakota, Bottineau County; Geodetic Survey of Canada, 1925).—The General Land Office quarter-section corner between secs. 35 and 36, T. 163 N., R. 81 W., fifth principal meridian.

Antler Church (North Dakota, Bottineau County; Geodetic Survey of Canada, 1925).—The Lutheran church at Antler.

Station mark: The center line of the spire.

Kuroki Elevator (North Dakota, Bottineau County; Geodetic Survey of Canada, 1925).—The southeastern of two elevators at Kuroki.

Station mark: The southwest end of the ridge of the elevator roof.

Church No. 7 (North Dakota, Bottineau County; Geodetic Survey of Canada, 1925).—The white church near the southeast corner of sec. 9, T. 162 N., R. 82 W., fifth principal meridian.

Station mark: The center line of the spire.

D. L. S. No. 34 (Manitoba, Souris District; Geodetic Survey of Canada, 1925).—The Dominion Lands Survey quarter-section post on the east boundary of sec. 26, T. 1, R. 27 W., principal meridian.

Cameron Elevator (Manitoba, Souris District; Geodetic Survey of Canada, 1925).—The red elevator at Cameron.

Station mark: The apex of the peaked roof of the elevator.

G. L. O. No. 29 (North Dakota, Bottineau County; Geodetic Survey of Canada, 1925).—The General Land Office corner between secs. 15, 16, 21, and 22, T. 163 N., R. 79 W., fifth principal meridian.

Coulter Water Tank (Manitoba, Souris District; Geodetic Survey of Canada, 1925).—The water tank on the Canadian Pacific Railway, west of Coulter.

Station mark: The guage pole above the tank.

Coulter Church (Manitoba, Souris District; Geodetic Survey of Canada, 1925.)—The United church at Coulter.

Station mark: The center line of the spire.

Landa Church (North Dakota, Bottineau County; Geodetic Survey of Canada, 1925).—The white church at Landa. The spire is on the west end of the church.

Station mark: The center line of the spire.

Church No. 8 (North Dakota, Bottineau County; Geodetic Survey of Canada, 1925).—The white church, with a belfry on the east end, situated on the east side of sec. 18, T. 163 N., R. 76 W., fifth principal meridian. Station mark: The center of the belfry.

Carbury School (North Dakota, Bottineau County; Geodetic Survey of Canada, 1925).—The brick school at Carbury.

Station mark: The base of the flagpole.

Church No. 9 (North Dakota, Bottineau County; Geodetic Survey of Canada, 1925).—The Lutheran church about 4 miles north and 1 mile west of Roth. This church has a spire at the junction of two wings, one wing running east and the other south.

Station mark: The center line of the spire.

Waskada Church (Manitoba, Souris District; Geodetic Survey of Canada, 1925).—The United church at Waskada.

Station mark: The center line of the spire.

Scandia School (North Dakota, Bottineau County; Geodetic Survey of Canada, 1925).—The school of the Scandia Central School District, 1½ miles north and 4½ miles west of Souris.

Station mark: The center of the belfry.

Souris School (North Dakota, Bottineau County; Geodetic Survey of Canada, 1925).—The brick school at Souris.

Station mark: The center of the belfry.

Mouse River Church (North Dakota, Bottineau County; Geodetic Survey of Canada, 1925).—The white church with square belfry and prominent spire about 1 mile west of the southeast corner of T. 162 N, R. 79 W., fifth principal meridian.

Station mark: The center line of the spire.

Kramer Church (North Dakota, Bottineau County; Geodetic Survey of Canada, 1925).—The church with a tall spire at Kramer.

Station mark: The center line of the spire.

Minto Church (Manitoba, Souris District; Geodetic Survey of Canada, 1925).—The church at Minto. Station mark: The center line of the spire.

Fairfax Church (Manitoba, Souris District; Geodetic Survey of Canada, 1925).—The church east of two elevators at Fairfax. This church has a chimney on the north end and a spire on the south end.

Station mark: The center line of the spire.

Rhodes Water Tank (Manitoba, Souris District; Geodetic Survey of Canada, 1925).—The water tank at Rhodes.

Station mark: The center of the tank.

Minto School (Manitoba, Souris District; Geodetic Survey of Canada, 1925).—The school at Minto. Station mark: The flagpole on the belfry.

D. L. S. No. 35 (Manitoba, Souris District; Geodetic Survey of Canada, 1925).—The Dominion Lands Survey quarter-section post on the east boundary of sec. 8, T. 3, R. 18 W., principal meridian.

Boissevain Church (Manitoba, Souris District; Geodetic Survey of Canada, 1925).—The United church at the east end of Main St., Boissevain.

Station mark: The center line of the spire.

Ninga Church (Manitoba, Souris District; Geodetic Survey of Canada, 1925).—The United church at Ninga.

Station mark: The center line of the spire.

D. L. S. No. 36 (Manitoba, Souris District; Geodetic Survey of Canada, 1925).—The Dominion Lands Survey quarter-section post on the east boundary of sec. 10, T. 1, R. 17 W., principal meridian.

Margaret Elevator (Manitoba, Macdonald District; Geodetic Survey of Canada, 1925).—The most western elevator at Margaret.

Station mark: The apex of the peaked roof of the elevator.

Killarney Church (Manitoba, Souris District; Geodetic Survey of Canada, 1925).—The United church at Killarney.

Station mark: The center line of the spire.

- D. L. S. No. 37 (Manitoba, Souris District; Geodetic Survey of Canada, 1925).—The Dominion Lands Survey post at the northeast corner of sec. 12, T. 2, R. 16 W., principal meridian.
- D. L. S. No. 38 (Manitoba, Souris District; Geodetic Survey of Canada, 1925).—The Dominion Lands Survey post at the northeast corner of sec. 29, T. 2, R. 14 W., principal meridian.

Lena Elevator (Manitoba, Souris District; Geodetic Survey of Canada, 1925).—The Patterson elevator at Lena.

Station mark: The apex of the peaked roof of the elevator.

Enterprise Elevator (Manitoba, Souris District; Geodetic Survey of Canada, 1925).—The lone elevator at Enterprise.

Station mark: The apex of the peaked roof of the elevator.

Holmfield School (Manitoba, Souris District; Geodetic Survey of Canada, 1925).—The school at Holmfield.

Station mark: The center of the belfry.

Cartwright Church (Manitoba, Souris District; Geodetic Survey of Canada, 1925).—The United church at Cartwright.

Station mark: The center of the belfry.

Hansboro School (North Dakota, Towner County; Geodetic Survey of Canada, 1925).—The school at Hansboro.

Station mark: The center of the belfry.

Mather Church (Manitoba, Lisgar District; Geodetic Survey of Canada, 1925).—The church with a tall black spire at Mather.

Station mark: The center line of the spire.

Clearwater Elevator (Manitoba, Lisgar District; Geodetic Survey of Canada, 1925).—The Maple Leaf elevator at Clearwater.

Station mark: The apex of the peaked roof of the elevator.

D. L. S. No. 39 (Manitoba, Lisgar District; Geodetic Survey of Canada, 1925).—The Dominion Lands Survey quarter-section post on the north boundary of sec. 22, T. 1, R. 10 W., principal meridian.

Crystal City Church (Manitoba, Lisgar District; Geodetic Survey of Canada, 1925).—The church at Crystal City

Station mark: The center line of the spire.

Fallison Elevator (Manitoba, Lisgar District; Geodetic Survey of Canada, 1925).—The lone elevator at Fallison.

Station mark: The north end of the ridge of the elevator roof.

Purves Elevator (Manitoba, Lisgar District; Geodetic Survey of Canada, 1925).—The southeastern of two elevators at Purves. This elevator is sheathed with metal.

Station mark: The southwest end of the ridge of the elevator roof.

Sarles School (North Dakota, Cavalier County; Geodetic Survey of Canada, 1925).—The school at Sarles. Station mark: The base of the flagpole.

Clyde Church (North Dakota, Cavalier County; Geodetic Survey of Canada, 1925).—The church at Clyde. This church has a prominent spire.

Station mark: The center line of the spire.

St. Leon Church (Manitoba, Macdonald District; Geodetic Survey of Canada, 1925).—The church at St. Leon. This church has a prominent black spire on a square white belfry at the east end of the roof.

Station mark: The center line of the spire.

Calvin School (North Dakota, Cavalier County; Geodetic Survey of Canada, 1925).—The two-story brick school at Calvin.

Station mark: The flagpole on the belfry.

Pilot Mound School (Manitoba, Lisgar District; Geodetic Survey of Canada, 1925).—The school at Pilot Mound.

Station mark: The center line of the dome on the belfry.

Manitou Normal School (Manitoba, Lisgar District; Geodetic Survey of Canada, 1925).—The Normal school at Manitou.

Station mark: The center of the round dome.

Mariapolis Church (Manitoba, Macdonald District; Geodetic Survey of Canada, 1925).—The church at Mariapolis. This church has a prominent spire on a square base which is open on all sides.

Station mark: The center line of the spire.

Kaleida Elevator (Manitoba, Lisgar District; Geodetic Survey of Canada, 1925).—The northern of two elevators at Kaleida. This elevator is owned by Wiley Low & Co.

Station mark: The apex of the peaked roof of the elevator.

Hannah School (North Dakota, Cavalier County; Geodetic Survey of Canada, 1925).—The school with a belfry and flagpole at Hannah.

Station mark: The center of the belfry.

Snowflake School (Manitoba, Lisgar District; Geodetic Survey of Canada, 1925).—The school at Snow-flake.

Station mark: The flagpole on the schoolhouse.

Wales Church (North Dakota, Cavalier County; Geodetic Survey of Canada, 1925).—The taller of two church spires at Wales. This spire has a square base.

Station mark: The center line of the spire.

Mowbray Elevator (Manitoba, Lisgar District; Geodetic Survey of Canada, 1925).—The Donovan elevator at Mowbray.

Station mark: The south end of the ridge of the elevator roof.

D. L. S. No. 40 (Manitoba, Lisgar District; Geodetic Survey of Canada, 1925).—The Dominion Lands Survey post at the northeast corner of sec. 19, T. 3, R. 7 W., principal meridian.

Darlingford Elevator (Manitoba, Lisgar District; Geodetic Survey of Canada, 1925).—The easternmost of three elevators at Darlingford. This elevator is painted red.

Station mark: The apex of the peaked roof of the elevator.

North Outlook (Manitoba, Lisgar District; J. J. McArthur, 1911; Geodetic Survey of Canada, 1925).—About 3½ miles north of International Boundary Monument 792, on the highest point of a knoll on a prominent ridge running north and south, in SE½ sec. 20, T. 1, R. 5 W., principal meridian. The station is in a rocky pasture field.

Station mark: Originally a wooden hub. In 1919 it was re-marked as follows: A bronze disk, marked "U. S. & C. B. SURVEY", was set in the top of a granite boulder, 10 by 10 by 18 inches, set on end with the top just above the surface of the ground. The subsurface mark is a cross in a granite boulder 12 by 12 by 6 inches set 20 inches underground. The reference mark is a "V" cut in a large boulder 6.51 meters nearly due east from the station; a second reference mark is a similar "V" cut in a boulder 3 feet long and 18 inches wide, 4.66 meters nearly northwest of the station.

South Outlook (Manitoba, Lisgar District; J. J. McArthur, 1911; Geodetic Survey of Canada, 1925).— About 1 mile north of International Boundary Monument 792, on a little knoll on the east edge of the broken plateau overlooking the lowlands of the Red River Valley, in SE¼ sec. 8, T. 1, R. 5 W., principal meridian, about 30 meters north and 350 meters west of the southeast corner of the section. The top of the knoll is practically bare, though there are timber and brush around it. The station is just north of a shale cut, 6 feet deep, where road material has been excavated on the section line. It overlooks the valley plains to the east.

Station mark: Originally a wooden hub. In 1919 it was re-marked as follows: A bronze disk, marked "U. S. & C. B. SURVEY", was set in the top of a granite boulder 10 by 10 by 20 inches, set on end with the top just above the surface of the ground. The subsurface mark is a cross cut in a granite boulder 10 by 10 by 6 inches set 20 inches underground. One reference mark is a cross cut on a very large granite boulder, 21.88 meters a little west of north from the station. A second reference mark is a cross cut on a very large granite boulder 20.64 meters nearly southeast of the station.

Windygates Elevator (Manitoba, Lisgar District; Geodetic Survey of Canada, 1925).—The elevator at Windygates.

Station mark: The north end of the ridge of the elevator roof.

Thornhill School (Manitoba, Lisgar District; Geodetic Survey of Canada, 1925).—The school at Thornhill. Station mark: The center of the belfry.

Sperling Elevator (Manitoba, Macdonald District; Geodetic Survey of Canada, 1925).—The middle elevator of three at Sperling.

Station mark: The center of the elevator.

Roland Elevator (Manitoba, Macdonald District; Geodetic Survey of Canada, 1925).—The western of two elevators at Roland. This elevator is painted red.

Station mark: The apex of the peaked roof of the elevator.

Kronsgart Elevator (Manitoba, Lisgar District; Geodetic Survey of Canada, 1925).—The lone green elevator at Kronsgart.

Station mark: The middle point of the ridge of the elevator roof.

Church No. 10 (Manitoba, Lisgar District; Geodetic Survey of Canada, 1925).—The church at the northeast corner of sec. 16, T. 1, R. 6 W., principal meridian.

Station mark: The center line of the spire.

Homen Church (North Dakota, Cavalier County; Geodetic Survey of Canada, 1925).—The white church with a tall black spire at Homen.

Station mark: The center line of the spire.

Carman Water Tank (Manitoba, Macdonald District; Geodetic Survey of Canada, 1925).—The elevated water tank at Carman.

Station mark: The center of the tank.

D. L. S. No. 41 (Manitoba, Lisgar District; Geodetic Survey of Canada, 1925).—The Dominion Lands Survey post at the northeast corner of sec. 2, T. 3, R. 5 W., principal meridian.

Olga Church (North Dakota, Cavalier County; Geodetic Survey of Canada, 1925).—The church at Olga. This church has a square spire on the east end and a chimney on the west end.

Station mark: The center line of the spire.

D. L. S. No. 42 (Manitoba, Lisgar District; Geodetic Survey of Canada, 1925).—The Dominion Lands Survey quarter-section post on the east boundary of sec. 23, T. 2, R. 3 W., principal meridian.

Kane Elevator (Manitoba, Lisgar District; Geodetic Survey of Canada, 1925).—The western of two elevators at Kane. This elevator is painted yellow.

Station mark: The south end of the ridge of the elevator roof.

Lowe Farm Elevator (Manitoba, Lisgar District; Geodetic Survey of Canada, 1925).—The western of two elevators at Lowe Farm. This elevator is painted yellow.

Station mark: The south end of the ridge of the elevator roof.

Leroy Church (North Dakota, Pembina County; Geodetic Survey of Canada, 1925.)—The church at Leroy. Station mark: The cross on the spire.

Altona Mill Chimney (Manitoba, Lisgar District; Geodetic Survey of Canada, 1925).—The prominent mill chimney at Altona.

Station mark: The center of the chimney.

D. L. S. No. 43 (Manitoba, Lisgar District; Geodetic Survey of Canada, 1925).—The Dominion Lands Survey post at the northeast corner of sec. 10, T. 2, R. 1 W., principal meridian,

Bathgate Elevator (North Dakota, Pembina County; Geodetic Survey of Canada, 1925).—The elevator at Bathgate.

Station mark: The west end of the ridge of the elevator roof.

D. L. S. No. 44 (Manitoba, Provencher District; Geodetic Survey of Canada, 1925).—The survey post at the southwest corner of river lot 121 in the parish of Ste. Agathe.

Rosenfeldt Elevator (Manitoba, Lisgar District; Geodetic Survey of Canada, 1925).—The metal covered elevator at Rosenfeldt.

Station mark: The west end of the ridge of the elevator roof.

Letellier Elevator (Manitoba, Provencher District; Geodetic Survey of Canada, 1925).—The eastern of two elevators at Letellier, known as the N. M. Patterson elevator.

Station mark: The west end of the ridge of the elevator roof.

GEORGIA STRAIT TO LAKE OF THE WOODS, MAJOR SCHEMES

Point Roberts 1934 (Washington, Whatcom County; A. C. Baldwin, 1934).—On the southeast point of the peninsula of Point Roberts, on the top of the bluff about 200 feet above the buildings of the Alaska Packers Association cannery on the beach. The station is about 6 meters back from the south edge of the bluff.

Station mark: A standard U. S. Coast and Geodetic Survey bronze-disk station mark set in a concrete pier. Two standard U. S. Coast and Geodetic Survey bronze-disk reference marks are set in concrete piers respectively 9.92 meters from the station in azimuth 54°36′26″, and 5.86 meters from the station in azimuth 132°22′26″.

Oertel (Washington, Whatcom County; A. C. Baldwin, 1934).—On the east shore of Semiahmoo Bay about 1 mile north of Birch Point. The station is on a bluff about 100 feet in height and is about 5 meters back from the edge of the bluff. The new road from Drayton Harbor to Birch Point passes within 150 meters of the station at a point where it makes a right-angle turn to the south.

Station mark: A standard U. S. Coast and Geodetic Survey bronze-disk station mark set in a concrete pier. A standard U. S. Coast and Geodetic Survey bronze-disk reference mark set in a concrete pier is 5.71 meters from the station in azimuth 1°08′40″.

Drayton I (Washington, Whatcom County; U. S. Coast and Geodetic Survey, 1888; 1905).—On the southwest end of the open part of the spit dividing Semiahmoo Bay from Drayton Harbor; 11 paces from the highwater mark of Semiahmoo Bay and 4 paces from that of Drayton Harbor.

Station mark: A drill hole in a stone beneath the surface of the ground. The station was found in 1905 with 3 hubs, 1.8 meters apart, set in line parallel to the shore line. The middle hub was over the station mark. A

telegraph pole stood 1.9 meters from the station nearly at right angles with the shore line and toward Drayton Harbor.

Trap (Washington, Whatcom County; U. S. Coast and Geodetic Survey, 1888; 1905).—On a slight point of the shore line about half way along the south side of Drayton Harbor, but nearer the head of the bay. The bluff at this point is about 15 feet high. The station is on the beach about 8 paces outward from the high-water mark. Back of the station and a little to the westward is a small rayine with water running in it in wet weather.

Station mark: A drill hole in a triangular boulder about 4 feet on each side and rising about 2 feet above the beach.

Miller (Washington, Whatcom County; E. C. Barnard, 1905).—In the city of Blaine at the intersection of Cedar Street and Washington Avenue; 3 meters from the edge of the bluff overlooking the spur of the Great Northern Railway running from the main line to the wharf; in front of D. S. Miller's house, 18.7 meters S. 36° W. from the southwest corner of his yard fence.

Station mark: A bronze disk set in a granite boulder flush with the surface of the ground.

Creek (Washington, Whatcom County; U. S. Coast and Geodetic Survey, 1888; 1905).—At the head of Drayton Harbor, on a point just west of the mouth of California Creek. The station is on a bluff 8 feet high and it is about 3 paces back from the edge of the bluff. A road following the shore line from Blaine turns inshore here and cuts across the point. A fence is inside the road. The distance to the station from the angle of the fence at the turn of the road is about 8 meters. A large boulder about 30 meters outside the shore line is in line with the dwelling house of Mr. Dexter. There is another large boulder about 20 meters upshore.

Station mark: A drill hole in a stone placed 1 foot below the surface of the ground. In 1905 two trees were marked, one N. 48°30′ E., 4.4 meters distant from the station; the other S. 51°00′ E., 4.7 meters distant from the station

Nooksack (Washington, Whatcom County; E. C. Barnard, 1906).—Near the flat summit of Nooksack Mountain about 1 mile south of triangulation station "Sumas Mountain." The station is about 200 meters down the south side of the main ridge from the summit of the mountain and about 50 feet lower in elevation than the summit

Station mark: A bronze-disk triangulation mark set 1 foot underground, over which is a stone with a drill hole in the center set flush with the surface of the ground. Over the stone is a small pile of broken rock.

Toad (Washington, Whatcom County; E. C. Barnard, 1905).—On a solid rock ledge, the highest point between Toad Lake and Van Wyck. This station is on a timbered hill which is a peak at the west end of a much higher ridge.

Station mark: A bronze-disk triangulation mark set in solid rock.

Frances (Washington, Whatcom County; U. S. Coast and Geodetic Survey, 1887; 1913).—On the east base of Point Frances at a point where station "John" can be seen by looking along the shore to the northward. The station is 17.1 meters north of a composition nail in a blaze on a large lone fir tree, on line to station "John." The station is on a sloping bench 6 feet above tide and 3 meters back from the beach.

Station mark: A half-inch drill hole 2 inches deep in a stone 8 inches below the surface of the ground.

Chuckanut (Washington, Whatcom County; U. S. Coast and Geodetic Survey, 1887; 1913).—On Chuckanut Point, where Chuckanut Island is just lost to view. From the station, four paces seaward brings this island in sight. The station is about 10 feet above high tide.

Station mark: A drill hole in solid rock. The reference mark is an arrow, pointing towards the station, cut in solid rock on line to station "Town." The point of the arrow is 3.7 meters from the station.

John (Washington, Whatcom County; E. C. Barnard, 1905; 1913).—One mile south of Lummi church, on a bench about 30 feet above high tide, and about 100 meters from the south end of the Fish Point village of the Lummi Indians.

Station mark: A bronze-disk triangulation mark set in the center of a grey granite boulder set in the ground with its top level with the surface.

Pearson (Washington, Whatcom County; E. C. Barnard, 1905).—On the east side of a road in a lane about 1½ miles west and one-fourth mile north of Ferndale on the east line of the Mount View school district. The station is 18.2 meters south of the north post of a gate and on the opposite side of the road.

Station mark: A bronze-disk triangulation mark set in a stone placed in the ground with its top level with the surface. The reference mark is 3 spikes driven in a stump 0.33 meter west of the station mark.

Jack (Washington, Whatcom County; E. C. Barnard, 1904).—On the highest mountain in the Ruby Creek region lying between Ruby Creek on the south and the Skagit River on the west.

Station mark: A triangle between the letters "U" and "S", cut in the rock, over which a 7-foot cairn was built.

Hozomeen (Washington, Whatcom County; E. C. Barnard, 1904; 1935).—About 1½ miles south of the International Boundary, and 3¾ miles east of the Skagit River; on the highest of the high rocky peaks of the Hozomeen Range.

Station mark: An aluminum-disk station mark of the International Boundary survey of 1904–5 set in a drill hole in solid rock.

Lightning (British Columbia, Yale District; E. C. Barnard, 1905; 1935).—On the most northern peak of the Hozomeen Range, about 4½ miles north of the International Boundary and about 3 miles east of the Whitworth ranch on the Skagit River. The peak is a round and nearly bald knob.

Station mark: An aluminum triangulation disk, set in rock, over which is a 3-foot cairn.

Smoky (Washington, Okanogan County; E. C. Barnard, 1904; 1935).—On a high, rocky peak near the backbone of the Cascade Range and near the head of Chuwanten Creek; about 5½ miles south of the International Boundary and 2½ miles west of the Pasayten River.

Station mark: An aluminum-disk triangulation mark, set in rock, over which is a 7-foot cairn.

Frosty West (British Columbia, Yale District; E. C. Barnard, 1904; 1935).—On a rocky ridge, part of the summit of the Cascade Range, on the divide between the waters of Cambie Creek and Lightning Creek, about 1 mile north of the International Boundary. This station should not be confused with station "Frosty" which is on a pyramidal mountain about one-half mile to the southeast, on a point which appears more prominent when viewed from the east.

Station mark: An aluminum-disk triangulation mark, set in rotten rock, over which is a 5-foot cairn.

Roche (British Columbia, Yale District; E. C. Barnard, 1904; 1935).—On a bald knob on the highest point of the divide between the Similkameen and Pasayten Rivers; about 2½ miles north of the International Boundary.

Station mark: An aluminum-disk triangulation mark, set in rock, over which is a 7½-foot cairn.

Ashnola (Washington, Okanogan County; E. C. Barnard, 1904; 1935).—On a high dome-shaped mountain about 5 miles south of the International Boundary, on the divide between the Ashnola and Pasayten Rivers, at the head of the east fork of the Pasayten River. It can be reached by following the divide south from Park (Sheep) Pass.

Station mark: An aluminum-disk triangulation mark set in rock over which is a 6-foot earn.

Princeton (British Columbia, Yale District; E. C. Barnard, 1904; 1935).—On a grassy hill on the divide between Ashnola Creek and the Pasayten River; about 5 miles north of the International Boundary.

Station mark: An aluminum-disk triangulation mark, set in solid rock, over which is a 3½-foot cairn.

Goat (Washington, Okanogan County; E. C. Barnard, 1904).—On a rocky peak sloping to the south on the divide between the east fork of the Methow River and Lost River, about 5 miles east of Robinson Roadhouse.

Station mark: An aluminum-disk triangulation mark, set in solid rock, over which is a 6½-foot cairn.

Wirdy, 1935 (Washington, Okanogan County; Jesse Hill, 1935).—About 5 miles south of the International Boundary and about 4 miles southwest of Horseshoe Pass; on the summit of Windy Mountain. This station supersedes station "Windy" of 1904 on the same mountain peak. The old station was lost during the erection of a lookout house on the summit of the mountain by the U. S. Forest Service.

Station mark: A drill hole, with a triangle cut around it, in solid rock. The north corner of the lookout is in approximate azimuth 270° distant 9.63 meters from the station, and the west corner of the lookout is in approximate azimuth 297° distant 8.14 meters from the station. The side of the lookout facing the station is 4.35 meters in length.

Similkameen (Washington, Okanogan County; C. H. Sinclair, 1904; 1930).—On a high grassy peak, 1¼ miles due southeast of Nighthawk, Washington, and directly above the town.

Station mark: An aluminum disk set in a boulder projecting 8 inches above the ground.

End (British Columbia, Yale District; C. H. Sinclair, 1904; 1935).—About 4 miles a little east of north from Nighthawk, Washington, and about 1¾ miles north of the International Boundary. The station is on a high peak, bare on the south edge of the summit, but heavily wooded on the north side.

Station mark: An aluminum disk set in solid rock. In 1935 the aluminum disk had been removed from the drill hole.

Osoyoos (Washington, Okanogan County; C. H. Sinclair, 1904; 1930).—On the summit of Kruger Mountain, a bare, high peak on the first range of mountains west of Osoyoos Lake, about 2 miles west of the lake and 1 mile south of the International Boundary.

Station mark: A drill hole in rock. It is probable that a bronze-disk station mark was set in the drill hole in 1930.

Hump (Washington, Okanogan County; C. H. Sinclair, 1904; 1930).—On a high, lone peak just north of a number of densely wooded peaks east of the south end of Osoyoos Lake, and about 5 miles south of the International Boundary.

Station mark: An aluminum disk set in rock.

Sidley (British Columbia, Yale District; C. H. Sinclair, 1904; 1930).—On a bare spot on a spur ridge running nearly north and south, about 4 miles east of Osoyoos Lake and 1¾ miles north of the International Boundary. The station is quite a little below the summit of the ridge, which is heavily timbered, and does not see any of the boundary monuments.

Station mark: An aluminum disk set in solid rock.

Balsam (Washington, Okanogan County; C. H. Sinclair, 1904; 1930).—On a high, grassy peak about 4 miles south of the International Boundary and about 2 miles south and a little east of Molson. A road from Molson leads nearly to the station.

Station mark: An aluminum disk set in a stone 18 by 18 by 24 inches firmly set in the ground.

Bolster (Washington, Okanogan County; C. H. Sinclair, 1904; 1930).—About 2 miles due west of Bolster and about 2 miles south of the International Boundary; on a high bare point, the highest in the vicinity.

Station mark: In 1930 a 2-inch bronze disk marked "U. S. & C. B. SURVEY" was set in the original drill hole marking the station.

Tippie (British Columbia, Yale District; C. H. Sinclair, 1904; 1930).—On a high and prominent rocky peak about 2½ miles north of the International Boundary and about three-fourths mile east of the road between Midway and Bolster. The station, which is about three-fourths mile northwest of the most northern bend of Myers Creek, where it turns from the northeast to the southeast, is visible from the road and is easily reached from it.

Station mark: An aluminum disk set in rock.

Copper (Washington, Okanogan County; C. H. Sinclair, 1904; 1930).—On a high peak of Copper King Mountain and just south of the head of Gold Creek, about 2½ miles east of Bolster, from which town it can be easily reached by road and trail. The Caribou Mine is a short distance from the station.

Station mark: An aluminum disk set in solid rock.

Knob (Washington, Ferry County; C. H. Sinclair, 1904; 1930).—On a high, bare ridge 2 miles southwest of the town of Midway, British Columbia, the second bare knob south of the International Boundary. The station can be easily reached by going up the first gulch south of the boundary and west of Kettle River, and thence up the partly wooded ridge to the summit.

Station mark: An aluminum disk marked "U. S. & C. B." set in solid rock.

Midway (British Columbia, Yale District; C. H. Sinclair, 1904; 1930).—On the southwest end of a bare peak, the highest in the vicinity, just north and 1½ miles distant from the town of Midway.

Station mark: Originally an aluminum disk set in solid rock. In 1930 the station was found to be re-marked by a small bronze disk bearing the letters "B. C."

Fir (Washington, Ferry County; C. H. Sinclair, 1904; 1930).—About three-fourths mile south of the International Boundary on a wooded peak on the main ridge running nearly north and south across the boundary about half way between Danville, Washington, and Midway, British Columbia. The station can be best reached by following around the ridge from the City of Paris Mine.

Station mark: An aluminum disk set in solid limestone.

Eagle (British Columbia, Yale District; C. H. Sinclair, 1904; 1930).—About 4 miles north of Danville, Washington, and about 4 miles northwest of Grand Forks, on a high round-topped hill with a few large fir trees on it, locally known as Eagle Mountain. The Hesperian Mine is located on the west slope of the hill. A road from Columbia leads to a ranch on a hill one-half mile to the east, from which a trail leads to the mine.

Station mark: An aluminum disk set in rock.

Hardy (British Columbia, Yale District; C. H. Sinclair, 1904; 1930).—On Hardy Mountain, a grassy hill 2 miles north of the International Boundary and about 4 miles west of Grand Forks, nearly due north of Danville, Washington.

Station mark: In 1930 a 2-inch bronze disk marked "U. S. & C. B. SURVEY" was set in the original drill hole marking the station.

Grand Forks (British Columbia, Yale District; C. H. Sinclair, 1904; 1930).—On a high rocky hill over-looking and on the north side of Grand Forks. The crest of the hill runs nearly east and west. The north and the south sides of the hill are very steep. The best approach is by going up the west slope.

Station mark: An aluminum disk set in solid rock. The reference mark is a cairn 2.5 meters from the station.

Danville West Base (British Columbia, Yale District; C. H. Sinclair, 1904; 1930).—Nearly three-fourths mile northeast of Danville, Washington, on the right-of-way of the Vancouver, Victoria & Eastern branch of the Great Northern Railway. The station is on a bank 6 meters south of the south rail, 9 meters west of the road crossing, and about 500 meters west of the west switch to Grand Forks.

Station mark: A cross on a copper bolt set in a 6- by 6- by 6-inch dressed granite block, placed 3½ feet underground. The surface mark is a cross on a copper bolt set in the top of a granite post 10 by 10 by 48 inches, set in concrete to a depth of 3 feet. The top 12 inches of this post are dressed, and the letters "U. S. C. B." are cut in the four corners of the top surface. A bench-mark disk is set in the top of the post at one side of the copper bolt.

Danville East Base (British Columbia, Yale District; C. H. Sinclair, 1904; 1930).—On the right-of-way of the Vancouver, Victoria & Eastern branch of the Great Northern Railway about 2 miles east of the railroad station at Danville. The station is on a bank 6 meters south of the south rail of the track, 275 meters east of the road crossing, 900 meters east of the east switch to Grand Forks and 1,800 meters east of "Danville West Base."

Station mark: A cross on a copper bolt set in a 6- by 6- by 6-inch dressed granite block, placed $3\frac{1}{2}$ feet underground. The surface mark is a cross on a copper bolt set in the top of a granite post 10 by 10 by 48 inches, set in concrete to a depth of 3 feet. The top 12 inches of this post are dressed, and the letters "U. S. C. B." are cut in the four corners of the top surface. A bench-mark disk is set in the top of the post at one side of the copper bolt.

Clement (British Columbia, Yale District; C. H. Sinclair, 1904).—About 2 miles west of Grand Forks, on a prominent knoll about 100 meters northwest of a house, and about 30 meters east of the spur of the Great Northern Railway (now abandoned) leading to Phoenix.

Station mark: An aluminum disk set in solid rock. The reference mark is a large pine tree about 3 meters west of the station.

Sitcum (Washington, Ferry County; C. H. Sinclair, 1904).—About 4 miles east of Danville and the same distance south of Grand Forks, British Columbia; on a high peak, overlooking the valley of Kettle River, partly timbered on the north, east, and west sides; the north side is very steep. The station may be reached by following the road from Danville up Lone Ranch Creek for about 4 miles and then climbing the ridge to its summit. Station mark: An aluminum disk set in a large rock on the summit of the peak.

Gilpin (British Columbia, Yale District; C. H. Sinclair, 1904; 1930).—About 4 miles east of Grand Forks and about 3 miles north of the International Boundary, just north of the northern loop of Kettle River, on the southeast point of a high peak.

Station mark: An aluminum disk set in solid rock.

Cascade (British Columbia, Yale District; C. H. Sinclair, 1904; 1930).—About 2 miles northwest of Cascade, on a high peak. The station can be easily reached.

Station mark: A drill hole in solid rock. In 1930 a 2-inch bronze disk was set in the original drill hole.

Owl (Washington, Ferry County; C. H. Sinclair, 1904; 1930).—About 3 miles southwest of Laurier, on a high summit about one-fourth mile west of the abandoned Owl Mine. The trail to this mine leaves the road about 3 miles south of Laurier where the road makes a sharp bend to the left toward Kettle River.

Station mark: A drill hole in solid rock. The reference mark is an arrow cut in the rock about 3 meters to the west. In 1930 a 2-inch bronze disk was set in the original drill hole.

Horn (Washington, Stevens County; C. H. Sinclair, 1904).—About 1 mile south of International Boundary Monument 170, on the same low wooded ridge. The station can be reached by following the Grand Forks-Rossland road from the west as far as the summit of this ridge, and thence south along the divide to the station. Station mark: An aluminum disk set in solid rock.

Buck (British Columbia, Yale District; C. H. Sinclair, 1904).—About 3 miles north of the International Boundary, on the most eastern and highest mountain on the divide at the head of the north fork of Deep Creek. The station can be reached by following north along the divide from the point where it is crossed by the Grand Forks-Rossland road.

Station mark: An aluminum disk set in rock.

Record (British Columbia, Kootenay West District; J. J. McArthur, 1904).—On the summit of Record Mountain west of Rossland.

Station mark: A drill hole in a rock.

Northport (Washington, Stevens County; Jesse Hill, 1930; 1934).—Three miles south of Northport, on the highest point south of the first creek on the west side of the valley of the Columbia River. This is not station "Northport" established by J. J. McArthur in 1904. It is probably 0.53 meter northeast of Mr. McArthur's station, the identification of which was uncertain in 1930.

Station mark: A 2-inch bronze disk, marked "U. S. & C. B. SURVEY", set in a drill hole in the outcropping rock.

Porthill (British Columbia, Kootenay West District; J. J. McArthur, 1904; 1934).—On first peak north of the International Boundary and west of the Kootenay Valley.

Station mark: Originally recorded as a hole drilled in rock. In 1930 the station was identified by an old tripod signal, but no drill hole was found in the loose rock under the tripod. The center of the old tripod was adopted as the station and a bronze disk for reference was set in a solid granite outcrop near the center of a clear space of several hundred feet radius, where the slope breaks to the southeast. The disk is 8.66 meters from the point adopted as the station, in azimuth 313°42′.

Smith (Idaho, Boundary County; J. J. McArthur, 1904; 1936).—About 5 miles south of the International Boundary, on the first culminating point on the ridge south of Smith Creek, the second ridge south of the boundary.

Station mark: Originally recorded as a drill hole in rock. In 1930 the station was identified by the remains of an old tripod signal and a scratch on the rock under the center of the tripod. This point was marked with a 2-inch U. S. & C. B. bronze-disk bench mark set in a drill hole in the rock and a triangle was cut in the center of the disk. In 1934, the apex of the roof of a U. S. Forest Service lookout that had been built over the station was found to be 1.91 meters from the station in azimuth 5°38′.

Hawkins (British Columbia, Kootenay East District; C. H. Sinclair, 1903; 1934).—On the partly wooded summit of the high mountain $3\frac{1}{2}$ miles west of the Moyie River and $1\frac{1}{2}$ miles north of the International Boundary. Boundary Monument 212 and triangulation station "Harvey" are on the same ridge, but further south. The top of the ridge is easily traveled between the stations, and trails lead south from station "Harvey" to Round Prairie.

Station mark: Originally a drill hole in solid rock. In 1934 the station was recovered and a 3-inch bronzedisk station mark bearing the words "INTERNATIONAL BOUNDARY COMMISSION" was set in the original drill hole.

Hell Roaring (Idaho, Boundary County; U. S. Geological Survey, 1897; 1934).—On the summit of the high mountain 2 miles west of the Moyie River and 6½ miles south of the International Boundary. The station can be reached by several U. S. Forest Service trails. The Queen Mine is a short distance northwest of the station. Station mark: A 1¼-inch copper bolt bearing the letters "U. S. G. S." set in solid rock.

Hunter (British Columbia, Kootenay East District; C. H. Sinclair, 1905; 1934).—On the summit of the flat, timbered ridge between Cannuck Creek and the Moyie River; 1.7 miles north of International Boundary Monument 220; on a bare elevated spot near the eastern rim of the ridge.

Station mark: The original station mark, a drill hole in the center of a flat ledge of rock about 15 feet square, was recovered in 1934 and a 3-inch bronze-disk station mark bearing the words "INTERNATIONAL BOUNDARY COMMISSION" was set in the original drill hole.

Mahon (British Columbia, Kootenay East District; C. H. Sinclair, 1903; 1934).—On the summit of a long, wooded, north-and-south ridge that terminates on the south at Hawkins Creek just west of the mouth of American Creek. The station is 7 miles north of the International Boundary line, and about 4 miles northwest of the Hawkins Creek "Meadows." The area between the station and Hawkins Creek has been logged off and burned over to such an extent that the station is readily reached from Hawkins Creek.

Station mark: The original station mark, a drill hole in solid rock, was recovered in 1934 and a 3-inch bronzedisk station mark bearing the words "INTERNATIONAL BOUNDARY COMMISSION" was set in the original drill hole.

Burke (Montana, Lincoln County; C. H. Sinclair, 1903; 1934).—On the north end of a high mountain range between American Creek on the west and the headwaters of Hawkins Creek on the east; on the same range as, and 1½ miles north of the U. S. Forest Service station "Northwest Peak Lookout"; 0.9 mile south of International Boundary Monument 223. From its profile from the north the mountain is locally known as Flatiron.

Station mark: The original mark, a nail in a fir stump with a cairn built around it, was found intact in 1934. This mark was entirely removed and accurately replaced by a 3-inch bronze disk, bearing the words "INTERNATIONAL BOUNDARY COMMISSION", set with cement in a large boulder.

Lodge (British Columbia, Kootenay East District; C. H. Sinclair, 1903; 1934).—About 4 miles north of the International Boundary on a high, wooded summit of a north-and-south ridge that terminates on the south at the West Fork of Yaak River about three-fourths mile north of Monument 227.

Station mark: Originally a drill hole in solid rock. In 1934 the station was recovered and found marked by a small bronze disk, bearing the letters "B. C.", set in the original drill hole. This mark was left as found.

Roswell (Montana, Lincoln County; C. H. Sinclair, 1903; 1934).—On the highest point of a high wooded peak about 3 miles south of the International Boundary, and about 1 mile west of the West Fork of Yaak River. The station was recovered in 1934 and at that time the timber had all been fire killed for several miles around it.

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Station mark: The original mark was a drill hole in solid rock. Although the record is not conclusive, it is believed that in 1934 a 3-inch bronze disk bearing the words "INTERNATIONAL BOUNDARY COMMISSION" was set in the original drill hole.

Bevis (British Columbia, Kootenay East District; C. H. Sinclair, 1903; 1934).—Four and one-half miles north of the International Boundary, on the south end of a partly bare peak in the forks of the East Fork of the North Fork of Yaak River; the north end of the peak is wooded. A trail from the North Fork of Yaak River to Gold Creek leads to the base of the mountain.

Station mark: The original station mark was a drill hole in solid rock. The station was recovered in 1934 and found marked with a small bronze disk bearing the letters "B. C." set in the original drill hole. This mark was left in place.

Wood (Montana, Lincoln County; C. H. Sinclair, 1903; 1934).—On the highest knob of a wooded ridge running nearly north and south, about 2½ miles east of the North Fork of Yaak River and 1 mile south of the International Boundary. Since 1903 fire has swept over the station and destroyed the original stand of timber. In 1934 partial reforestation had taken place and the station was covered with a thick growth of pines about 20 feet in height. The station is easily approached from the south from the U. S. Forest Service lookout (Wood Lookout) on the south end of the mountain.

Station mark: In 1934 the original station mark, a drill hole in a large stone embedded in the ground, was recovered and a 3-inch bronze disk bearing the words "INTERNATIONAL BOUNDARY COMMISSION" was set in the original drill hole.

Caribou (Montana, Lincoln County; C. H. Sinclair, 1903; 1934).—On the highest point of Caribou Mountain, a high ridge running nearly north and south at the head waters of Gold Creek to the northeast, Caribou Creek to the southeast, and Blacktail Creek to the west. International Boundary Monument 236 is on the same ridge at a lower elevation, 0.6 mile northwest of the station.

Station mark: The station was recovered in 1934 and re-marked by cementing a 3-inch bronze-disk station mark, bearing the words "INTERNATIONAL BOUNDARY COMMISSION", into the original drill hole in solid rock. The three original references, an arrow cut on a large loose stone to the northeast 17 feet (paced), an arrow cut on solid rock to the south 13 feet (paced), and an arrow cut on a large loose rock to the west 8 feet (paced), were found as originally described.

Purcell (British Columbia, Kootenay East District; C. H. Sinclair, 1903; 1934).—On the Purcell Range, one-fourth mile north of the International Boundary and 11 miles west of Gateway, Montana; on a high peak covered with scrub pines.

Station mark: In 1934 the original station mark, a drill hole in solid rock, was recovered and a 3-inch bronze disk bearing the words "INTERNATIONAL BOUNDARY COMMISSION" was set in the drill hole.

Kootenai (British Columbia, Kootenay East District; C. H. Sinclair, 1903).—On the large, wooded summit about 10 miles northwest of Gateway, on the west side of the Kootenay River; on the highest part of the summit that rises toward the west from the precipitous east side.

Station mark: A drill hole in a triangular stone placed 2 feet underground. The surface mark is a drill hole in the end of an irregularly shaped stone 20 inches long set over the lower mark with a small flat stone placed between them. Three reference stones, one north and one south, marked with arrows, and one west, marked with a cross, are respectively 1.29, 2.05, and 1.42 meters from the station.

Gateway (British Columbia, Kootenay East District; C. H. Sinclair, 1903; 1934).—On the high knoll a short distance northeast of Gateway, Montana, about 300 meters northeast of International Boundary Monument 244. Not far north from the station are some large pines.

Station mark: The neck of a bottle, about 6 inches below the bottom of the surface mark, which is a block of granite, 6 by 6 by 48 inches, dressed 6 inches from the top and the remainder rough cut. A drill hole is in the center of this stone and the letters "U. S. C. B." are cut in the corners. The granite block projects about 8 inches above the ground.

Bowdich (Montana, Lincoln County; C. H. Sinclair, 1903; 1934).—On a high, wooded hill about one half mile south of the International Boundary and nearly 1 mile east of the Kootenai River. This was the azimuth station mark of 1903.

Station mark: The neck of a bottle, about 6 inches below the bottom of the surface mark, which is a block of granite, 6 by 6 by 48 inches, dressed 6 inches from the top and the remainder rough cut. A drill hole is in the center of this stone and the letters "U. S. C. B." are cut in the corners. The granite block projects about 8 inches above the ground.

Young (Montana, Lincoln County; C. H. Sinclair, 1903).—On a partly grassy knoll on the west bank of the Kootenai River about 1¾ miles south of the International Boundary, a little west and above a trail parallel to the river.

Station mark: The neck of a bottle, about 6 inches below the bottom of the surface mark, which is a block of granite, 6 by 6 by 48 inches, dressed 6 inches from the top and the remainder rough cut. A drill hole is in the center of this stone and the letters "U. S. C. B." are cut in the corners. The granite block projects about 8 inches above the ground.

Gateway North Base (Montana, Lincoln County; C. H. Sinclair, 1903; 1930).—A very short distance south of the town of Gateway, 36.2 meters west of the west rail of the Great Northern Railway, which runs nearly north and south.

Station mark: The underground mark is the neck of a bottle set in cement about 6 inches below the granite block used as a surface mark. The center of the mouth of the bottle is the station. The surface mark is a granite block, 12 by 12 by 48 inches, dressed 12 inches from the top and the remainder rough cut, set in concrete. This block projects 16 inches above ground. A copper bolt with cross was set for the center with the letters "U. S. C. B." cut in the stone around it. A bench-mark disk with its elevation stamped upon it was placed north of the center bolt after the stone was set.

Baldy (British Columbia, Kootenay East District; C. H. Sinclair, 1903; 1933).—On a high, bare, rocky peak locally called "Baldy", elevation about 8,000 feet, about 2 miles north of the falls of Phillipps Creek. Riding animals may be used as far as the Lamberton cabin on the Phillipps Creek trail and pack animals can be taken to within one-half mile of the station.

Station mark: Originally a drill hole in a large square rock set firmly in the ground. In 1933 the station was recovered, a copper rivet was cemented in the original drill hole, and a 4-foot cairn was erected over it.

Wam (Montana, Lincoln County; C. H. Sinclair, 1903).—On a bare hill, about 3 miles south of the International Boundary and south of the west fork of Wigwam River. There is no trail to the station.

Station mark: A drill hole in a large rock set firmly and rather low in the ground.

Wig (British Columbia, Kootenay East District; C. H. Sinclair, 1903; 1933).—On a high bare point on the ridge directly above and east of Wigwam River, about 2 miles north of the International Boundary.

Station mark: Originally a cross cut on a flat rock lying on the surface of the ground. The station was recovered in 1933, a ½-inch hole was drilled in the center of the cross, a copper nail was cemented in the hole, and a triangle was cut in the rock around it.

Canada (British Columbia, Kootenay East District; E. C. Barnard, 1903).—On a sharp limestone peak, the highest point in the immediate vicinity; precipitous on the east and only approachable from the west; about 4½ miles north of the International Boundary, and at the head of a large creek flowing into the Flathead River from the west, 3 miles above the boundary. It can be best reached by following up this creek, keeping to the right at each fork and following the second right-hand fork to its head in a low saddle. After passing this, cross to the first ridge running east and west, and go up this to the eastward to the summit of the peak.

Station mark: A ½-inch drill hole surrounded by a triangle in a lime rock 12 by 15 by 18 inches, firmly set in the ground, over which is a 4-foot cairn.

Hefty (Montana, Flathead County; E. C. Barnard, 1903; 1933).—On Hefty Mountain the highest point of a ridge about 4½ miles west of the Flathead River where it crosses the International Boundary, about one-fourth mile south of Monument 259. The station may be reached with horses from a trail which crosses the ridge a few meters north of the boundary near Monument 259.

Station mark: A drill hole with a triangle around it and the letters "U. S.", cut in a smooth flat stone 12 by 12 by 5 inches, placed with its surface flush with the ground. In 1933 a copper rivet was cemented into the drill hole.

Kishenehn (British Columbia, Kootenay East District; E. C. Barnard, 1903; 1933).—On the highest point of Mount Yarrell, the first peak east of the Flathead River on the northwest side of Kishenehn Creek; about 4½ miles northeast of where the International Boundary crosses Kishenehn Creek.

Station mark: Originally a drill hole in an outcropping ledge of red shale having a dip of about 45° to the south. When the station was recovered in 1933 the rock around it was found badly shattered and the drill hole all but obliterated. A ½-inch cold-chisel was found driven into the hole; this was left in place and a small cairn erected over it.

Kintla (Montana, Flathead County; E. C. Barnard, 1903; U. S. Coast and Geodetic Survey, 1925).—On the high, sharp, summit of Parke Peak in Glacier National Park, about 7 miles east of the Flathead River and about 1¾ miles south of the east end of Lower Kintla Lake.

Station mark: Originally a drill hole in a rock with a cairn built over it. The U. S. Coast and Geodetic Survey recovered the station in 1925, held the original mark, and placed a bronze wedge with a cross cut on it in a small cavity in solid rock 2 feet below the surface. They then replaced the original surface mark with one of their standard bronze-disk station marks set in a drill hole in a rock 7 by 12 by 24 inches in size. They also set two reference marks in rock outcrop but give no description of them.

Starvation (British Columbia, Kootenay East District; E. C. Barnard, 1903).—Near the north end of the northernmost of two peaks at the head of the north fork of Starvation Creek. A trail is cut to the basin head where wood, water, and grass are to be had for camping.

Station mark: A drill hole in the outcropping ledge, with a stone pile over it.

North Divide (British Columbia, Kootenay East District; Alberta, Macleod District; E. C. Barnard, 1903, 1933).—On the highest point of Mount Festubert, on the main divide of the Rocky Mountains between the north and the south forks of Kishenehn Creek. The old Alberta Trail goes up the north fork and a new trail up the south fork to a lower summit.

Station mark: A drill hole in a red stone about 4 by 5 by 15 inches, placed over a drill hole in the outcropping ledge, which is soft and shaly and has a dip of about 20° to the southwest. In 1933 a 5-foot cairn was found over the mark; this was left in place.

South Divide (Montana, Flathead and Glacier Counties; E. C. Barnard, 1903; 1909).—On the first peak; south of the International Boundary, of the main divide of the Rocky Mountains. The station is about one-half mile south of Monument 272.

Station mark: A drill hole in rock ledge with a stone pile over it; there are three other stone piles nearby.

Waterton (Alberta, Lethbridge District; C. H. Sinclair, 1909).—About 2¾ miles west of Waterton Lake and 2 miles north of Boundary Creek, on a peak which breaks vertically to the northwest and southeast. A small lake lies one-half mile to the northwestward.

Station mark: A cairn over a drill hole in rock in place.

Campbell S. W. (Montana, Glacier County; C. H. Sinclair, 1909).—In Glacier National Park, on the middle and highest peak of Mount Campbell. The station is 1½ miles west of Waterton Lake and 1 mile south of Boundary Creek, on the northeast tip of the peak. A narrow ridge extends about one-half mile southeastward. Station mark: A cairn over a drill hole in rock in place.

Sofa (Alberta, Lethbridge District; C. H. Sinclair, 1909).—About 2 miles north of the International Boundary and 5 miles west of Belly River, on the northeast end of the ridge overlooking the Belly River valley to the east and the plains to the north. The station is on the highest summit. The summit has a rounded top and no solid ledges.

Station mark: A cairn over a drill hole in a rock.

Belly (Montana, Glacier County; C. H. Sinclair, 1909).—About 3 miles south of the International Boundary and 3½ miles west of Belly River, on the northwest summit of the ridge northeast of Glenns Lake.

Station mark: A cairn over a drill hole in a red sandstone ledge.

Rim (Alberta, Lethbridge District; C. H. Sinclair, 1909; 1921).—About 1½ miles north of the International Boundary and 2 miles northwest of Lee Creek. The station is on the south edge of a flat-topped ridge about 3 miles long and is nearly 1 mile northeast of the summit of the mountain. The whole mountain is wooded.

Station mark: A drill hole in a rock nearly flush with the ground.

Chief Mountain (Montana, Glacier County; U. S. Geological Survey, 1901; 1909).—On the summit of Chief Mountain, a prominent mountain, 4½ miles south of the International Boundary and on the line between the Blackfeet Indian Reservation and Glacier National Park.

Station mark: The U. S. G. S. station mark is an aluminum disk stamped "9056", cemented in solid rock. A 6-foot cairn marking the turning point on the Blackfeet Indian Reservation—Glacier Park boundary stands 0.79 meter from the station mark in azimuth 314°. This boundary cairn was used as the station in 1909 by the International Boundary Commission and the geographic position given in this publication is that of the cairn.

Pike (Montana, Glacier County; C. H. Sinclair, 1909; 1921).—In the Blackfeet Indian Reservation, about 1½ miles southwest of Pike Lake. The station is in NE¼ sec. 17, T. 37 N., R. 14 W., principal meridian; about 200 meters south of the northeast corner of the section.

Station mark: A drill hole with a triangle in a white rock; subsurface mark, a bronze disk set about 1 foot underground

Police (Alberta, Lethbridge District; C. H. Sinclair, 1909; 1921).—In NE¼ sec. 7, T. 1, R. 26 W., fourth meridian. It is on a knoll about one-half mile north of Outpost Lake.

Station mark: A cairn over a drill hole in a granite ledge projecting about 1 foot above the ground. The reference marks are: A stone 25.6 meters from the station in azimuth 80°; a stone 17.4 meters from the station in azimuth 160°; and a boulder 29 meters from the station in azimuth 210°. On each stone is cut an arrow pointing toward the station.

St. Mary (Alberta, Lethbridge District; C. H. Sinclair, 1909).—In NW¼ sec. 7, T. 1, R. 25 W., fourth meridian; on a knoll near the west boundary, and about 100 meters south of the north boundary of the quarter section. The station is about 37.6 meters east of the road fence. The road allowance is too steep to be used as a roadway, but the fences are in place.

Station mark: A bronze disk set in a small stone. The reference marks are 3 stones—one 16.6 meters to the northeast; one 31.6 meters to the northwest; and one 16.5 meters to the southwest or southeast. Each stone is marked by an arrow pointing toward the station.

Spider (Montana, Glacier County; C. H. Sinclair, 1909; 1921).—In the Blackfeet Indian Reservation, near the center of SW¼ sec. 16, T. 37 N., R. 13 W., principal meridian. The station is on the most southern of the high points on the first ridge east of St. Mary River and about one-half mile north of Spider Lake.

Station mark: A drill hole in a granite ledge. The reference marks are 3 rocks—one 12.8 meters to the southwest; one 7.9 meters to the northwest; and one 7.7 meters to the southeast.

St. Mary North Base (Montana, Glacier County; O. B. French, 1912).—In the Blackfeet Indian Reservation, in NW¼ sec. 1, T. 37 N., R. 14 W., principal meridian. The station is about 350 meters southeast of the intersection of the roads on the south and east sides of sec. 3 on the Canadian side of the International Boundary. Monument 290 is about 250 meters west of the road intersection.

Station mark: A bronze disk set in a boulder projecting about 3 inches above the ground and a subsurface boulder 10 inches below the upper one, with the center marked by a cross.

St. Mary South Base (Montana, Glacier County; O. B. French, 1912; 1921).—In the Blackfeet Indian Reservation, on the highest hill in the locality; about 2 miles south of International Boundary Monument 290. The station is in NW¼ sec. 13, T. 37 N., R. 14 W., principal meridian, about 100 meters from the north boundary of the section and 200 meters west of the mid-section line. The main road northward from Babb is about one-half mile to the west.

Station mark: A cross on a boulder. The subsurface mark is a boulder 11 inches below the upper one, with the center also marked by a cross.

373-S (Montana, Glacier County; C. H. Sinclair, 1909; 1921).—In the Blackfeet Indian Reservation, on the high ridge east of the road that cross the International Boundary north of Peskan; nearly 1 mile from the road and 1½ miles north of Peskan. The station is near the northwest corner of NW¼ sec. 5, T. 37 N., R. 12 W., principal meridian. Monument 295 is 50.5 meters northeast of the station.

Station mark: A drill hole in a quartz ledge.

Milk (Alberta, Lethbridge District; C. H. Sinclair, 1909; 1921).—On a high hill about 2 miles northwest of the junction of the road that crosses the International Boundary near Monument 301, with the road that parallels the North Fork of Milk River on the United States side of the boundary. The station is about 400 meters southwest from where the road crosses the saddle of the ridge. It is in SE¼ sec. 6, T. 1, R. 23 W., fourth meridian.

Station mark: A drill hole in a granite boulder, referenced by three boulders—one 7.04 meters to the northwest; one 16.95 meters to the northeast; and one 7.89 meters to the southeast.

Lincoln (Montana, Glacier County; U. S. Geological Survey, 1901; International Boundary Commission, 1909; U. S. Coast and Geodetic Survey, 1923).—The station is 3.41 meters from station "Mussetter" in azimuth 60°19′53″. (See description of "Mussetter".)

Station mark: A standard U. S. G. S. bench-mark post set 3 feet in the ground and projecting 1 foot-above the ground.

New (Montana, Glacier County; C. H. Sinclair, 1910).—In the Blackfeet Indian Reservation, on a plateau about 2¾ miles south of the International Boundary and 5 miles east of the North Fork of Milk River. The station is in SE¼ sec. 17, T. 37 N., R. 10 W., principal meridian. A road from Browning, Montana, crosses the plateau about 100 meters east of the station, and about 300 meters to the westward the ground slopes steeply toward the river valley.

Station mark: A cairn over a bronze disk set in concrete.

Bunch (Alberta, Lethbridge District; C. H. Sinclair, 1910; 1921).—On the high bench about 2 miles eas. of the North Fork of Milk River and a little over one-half mile north of the International Boundary. The station is in NW¼ sec. 6, T. 1, R. 22 W., fourth meridian; about 15 meters east of the abrupt edge of the bencth Station mark: A drill hole in a small boulder embedded in the sod, with other small boulders around it.

Gap (Montana, Glacier County; C. H. Sinclair, 1910).—In the Blackfeet Indian Reservation, in NE¼ sec. 9, T. 37 N., R. 10 W., principal meridian. The station is on a low hill about 1 mile south of International Boundary Monument 304 and nearly 3½ miles east of the North Fork of Milk River. At the station the hill drops off to the north; to the west and south it is nearly level.

Station mark: A cairn over a bronze disk set in concrete.

Ridge (Montana, Glacier County; C. H. Sinclair, 1910; 1921).—In the Blackfeet Indian Reservation, in NE¼ sec. 11, T. 37 N., R. 10 W., principal meridian. The station is on the southeast end of a ridge 1 mile south of International Boundary Monument 305.

Station mark: A cairn over a bronze disk set in concrete.

Bluff (Alberta, Lethbridge District; C. H. Sinclair, 1910).—Near the center of sec. 10, T. 1, R. 22 W., fourth meridian. The station is on a grassy flat-topped hill about 1½ miles north of the International Boundary between Monuments 305 and 306.

Station mark: A drill hole in a rock set in the ground.

Center (Montana, Glacier County; C. H. Sinclair, 1910; 1921).—In the Blackfeet Indian Reservation, in SE¼ sec. 3, T. 37 N., R. 9 W., principal meridian. The station is on the same plateau about three-fourths mile southwest of International Boundary Monument 309 and is about 200 meters north and 300 meters west of the boundary lines of the section. The plateau breaks about 300 meters to the south and to the east.

Station mark: A cairn over a drill hole in a rock.

South (Montana, Glacier County; C. H. Sinclair, 1910).—In the Blackfeet Indian Reservation, in SW¼ sec. 24, T. 37 N., R. 9 W., principal meridian. The station is about 100 meters south of the midsection line and 300 meters from the west boundary of the section, on the highest and most eastern of four small humps about one-half mile south of the South Fork of Milk River.

Station mark: A cairn over a drill hole in a rock.

Table (Alberta, Lethbridge District; C. H. Sinclair, 1910).—In SE¼ sec. 12, T. 1, R. 21 W., fourth meridian. The station is about 2 miles east of the east end of the plateau lying between the North and South Forks of Milk River, on a flat-topped knoll, about 150 meters from the east and 250 meters from the south boundary of the section.

Station mark: Not given.

Bend (Montana, Glacier County; C. H. Sinclair, 1910).—In the Blackfeet Indian Reservation. The station is about 2 miles south of the International Boundary, in SW¼ sec. 10, T. 37 N., R. 8 W., principal meridian, and is on the east bank of the South Fork of Milk River, on a prominent butte near the south end of a ridge which slopes gradually to the east and shows a bluff on the river side. The river takes a sharp bend to the south, northwest of the station.

Station mark: A wrought iron bench-mark post with a brass top, projecting about 1 foot above the ground.

River (Alberta, Lethbridge District; C. H. Sinclair, 1910).—About 1½ miles west of the South Fork of Milk River and 3 miles northwest of the intersection of the river with the International Boundary. The station is in NW¼ sec. 14, T. 1, R. 20 W., fourth meridian, about 100 meters south of the north boundary of the section and the same distance west of the midsection line, and a little west of the highest part of the highest of a series of knolls.

Station mark: A drill hole in quartz rock flush with the ground.

Antelope (Montana, Glacier County; C. H. Sinclair, 1910).—In the Blackfeet Indian Reservation. The station is about 2 miles south of International Boundary Monument 317; in NE¼ sec. 14, T. 37 N., R. 7 W., principal meridian, roughly 200 meters from the north boundary of the section and 50 meters from the midsection line, and on the highest part of a ridge lying east and west.

Station mark: A chiseled cross in a granite boulder, flush with the ground.

Line (Montana, Glacier County; C. H. Sinclair, 1910).—In the Blackfeet Indian Reservation, a little over one-half mile southwest of International Boundary Monument 320. The station is near the middle of SW¼ sec. 4, T. 37 N., R. 6 W., principal meridian, on the highest part of a flat-topped knoll to the west of a large plateau. A number of large rocks are scattered around the station, which is 6.58 meters north of the largest rock.

Station mark: A cross on a rock.

Foot (Alberta, Lethbridge District; C. H. Sinclair, 1910).—On a small knoll about $2\frac{1}{2}$ miles north of International Boundary Monument 320, in SE $\frac{1}{4}$ sec. 18, T. 1, R. 18 W., fourth meridian, and about 200 meters from each of the midsection lines.

Station mark: A cairn over a cross on a flat rock.

Clear (Montana, Glacier County; C. H. Sinclair, 1910).—About 1½ miles south of International Boundary Monument 321 and a little more than one-half mile east of the fence marking the east boundary of the Blackfeet Indian Reservation. The station is on a rounded butte in SE¼ sec. 11, T. 37 N., R. 6 W., principal meridian. Two small lakes lie south of the butte.

Station mark: A stone pile.

Lake (Alberta, Lethbridge District; C. H. Sinclair, 1910).—About 2½ miles north of International Boundary Monument 323, in SW½ sec. 13, T. 1, R. 18 W., fourth meridian, close to the west boundary of the section. The station is about 90 meters south of the highest western point of the ridge.

Station mark: A drill hole and triangle in a granite boulder, flush with the ground; a red granite boulder about 90 meters to the north, on the highest part of the ground, is similarly marked.

Corner (Montana, Glacier County; C. H. Sinclair, 1910).—About 2 miles south of International Boundary Monument 323; in NW¼ sec. 17, T. 37 N., R. 5 W., principal meridian; on a prominent point showing as part of a ridge viewed from the north.

Station mark: A stone pile over a drill hole in a sandstone boulder flush with the ground, 8.3 meters west of a cairn.

Horse (Alberta, Lethbridge District; C. H. Sinclair, 1910).—About 2 miles north of International Boundary Monument 324; in SE¼ sec. 18, T. 1, R. 17 W., fourth meridian, about 100 meters from the south boundary of the section. The station is on a knoll about one-half mile north of a deep coulee which is a branch of Red Creek.

Station mark: A drill hole three-fourths inch deep in a granite boulder showing a pyramidal top nearly flush with the ground.

Cairn (Montana, Toole County; C. H. Sinclair, 1910; 1921).—About 2 miles south of International Boundary Monument 327; in NW¼ sec. 17, T. 37 N., R. 4 W., principal meridian. The station is on the highest point of a low flat-topped ridge lying approximately north and south.

Station mark: A drill hole and triangle cut in a granite boulder nearly flush with the ground, referenced by three granite boulders, each with an arrow pointing toward the station. The first is 49.5 meters from the station in azimuth 147°34′; the second is 10.8 meters from the station in azimuth 254°20′; the third is 10.5 meters from the station in azimuth 306°29′.

Red (Alberta, Lethbridge District; C. H. Sinclair, 1910; 1921).—About one-half mile northeast of International Boundary Monument 328; in the southeast corner of NE¼ sec. 6, T. 1, R. 16 W., fourth meridian. The station is on a hill 200 meters east of the road that crosses the boundary near Monument 328.

Station mark: A drill hole in rock near a cairn.

Crook (Alberta, Lethbridge District; C. H. Sinclair, 1910).—About 1½ miles northeast of International Boundary Monument 330; in the northwest corner of SW¼ sec. 11, T. 1, R. 16 W., fourth meridian. The station is on the south bank of Red Creek, where the creek makes a decided bend.

Station mark: A drill hole and triangle cut in a granite boulder.

Cliff (Montana, Toole County; C. H. Sinclair, 1910; 1921).—About 1½ miles southeast of International Boundary Monument 330; in sec. 7, T. 37 N., R. 3 W., principal meridian, about 200 meters east and slightly north of the middle of the section. The station is about 600 meters south of the road crossing Buckeye Coulee, on a ridge lying north and south.

Station mark: A cairn over a drill hole in a flat rock.

Peg (Alberta, Lethbridge District; C. H. Sinclair, 1910).—About one-third mile southwest of the west end of the dry lake bed that lies 1 mile west along the road from Coutts. The station is about one-half mile northeast of International Boundary Monument 332; in SW¼ sec. 5, T. 1, R. 15 W., fourth meridian. It is on a rise of ground close to the west boundary of the section.

Station mark: A drill hole and triangle in a granite boulder nearly flush with the ground.

Coutts Northwest Base (Alberta, Lethbridge District; C. H. Sinclair, 1910).—About 2 miles northwest of Coutts, near the Canadian Pacific Railway; in SE½ sec. 7, T. 1, R. 15 W., fourth meridian. The station is 11.24 meters south of the south side of the south rail of the track at a point marked by a cross filed on the top of the rail at or near the beginning of the curve to the northward.

Station mark: A bronze disk set in a block of concrete 2 feet deep in the ground.

Coutts Southeast Base (Alberta, Lethbridge District; C. H. Sinclair, 1910; 1917).—About 1½ miles northwest of Coutts, near the Canadian Pacific Railway; in NW¼ sec. 5, T. 1, R. 15 W., fourth meridian. The station is 11.24 meters from a cross filed on the top of the rail, and at right angles to the outer edge of the rail. It is 17.72 meters southeast of the point of the frog of the switch.

Station mark: A bronze disk, set in a block of concrete 2 feet deep in the ground.

Center I (Alberta, Lethbridge District; J. J. McArthur, 1908; 1917).—About 2 miles east of Coutts; in SW¼ sec. 2, T. 1, R. 15 W., fourth meridian. The station is on a gravel knoll 258 meters north of International Boundary Monument 336. A gravel pit was found in 1917 close to this station; it may have been destroyed at any time since then.

Station mark: A bronze disk set in a boulder about 14 inches in diameter.

Coffin (Alberta, Medicine Hat District; J. J. McArthur, 1908).—About 3½ miles north of International Boundary Monument 338; in SW¼ sec. 19, T. 1, R. 14 W., fourth meridian. The station is on the highest point north of the Coutts-Police Coulee road, roughly 5 miles northeast of Coutts.

Station mark: A bronze disk set in a rock.

Griffith (Montana, Toole County; J. J. McArthur, 1908).—About 1¾ miles south of the International Boundary midway between Monuments 338 and 339; in SE¼ sec. 10, T. 37 N., R. 2 W., principal meridian; close to the south boundary of the section and about midway between the east boundary and the midsection line. The station is on the most southern isolated knob in the vicinity.

Station mark: A bronze disk set in a boulder.

Ashe (Alberta, Medicine Hat District; J. J. McArthur, 1908).—About 4 miles due north of International Boundary Monument 341; in SE¼ sec. 26, T. 1, R. 14 W., fourth meridian. The station is two or three hundred meters from the east boundary of the section and from the midsection line.

Station mark: A bronze disk set in a boulder.

Sheep (Montana, Toole County; J. J. McArthur, 1910).—About 2½ miles south of International Boundary Monument 342; in SE½ sec. 16, T. 37 N., R. 1 E., principal meridian. The station is close to the east boundary of the section and about 200 meters south of the midsection line.

Station mark: Not described.

Center II (Montana, Toole County; J. J. McArthur, 1908).—About 1½ miles south of International Boundary Monument 343; in SW½ sec. 11, T. 37 N., R. 1 W., principal meridian. The station is on the highest part of the ridge, close to the east-and-west midsection line and about 200 meters from the north-and-south midsection line.

Station mark: A bronze disk set in a boulder.

Milk (Alberta, Medicine Hat District; J. J. McArthur, 1908).—About 4½ miles north of International Boundary Monument 346. The station is in SE¼ sec. 30, T. 1, R. 12 W., fourth meridian, on a high east-and-west ridge near the middle of the section.

Station mark: A bronze disk set in a boulder.

Mountain (Montana, Toole County; J. J. McArthur, 1908).—About 1 mile south of International Boundary Monument 348. The station is in NW¼ sec. 12, T. 37 N., R. 1 E., principal meridian, on the most northern spur of the Sweet Grass Hills.

Station mark: A bronze disk set in a rock.

Center III (Alberta, Medicine Hat District; J. J. McArthur, 1908; 1917).—In SW¼ sec. 5, T. 1, R. 11 W., fourth meridian. The station is 633 meters north of International Boundary Monument 351, on the highest point in the vicinity.

Station mark: A drill hole in a rock in place.

Roscoe (Montana, Toole County; J. J. McArthur, 1908).—About 3¼ miles south of International Boundary Monument 355. The station is near the center of sec. 22, T. 37 N., R. 3 E., principal meridian; on the highest part of the east-and-west ridge.

Station mark: A bronze disk set in a boulder.

Breed (Alberta, Medicine Hat District; J. J. McArthur, 1908).—About 3 miles north of International Boundary Monument 355; in NW¼, sec. 17, T. 1, R. 10 W., fourth meridian; about 100 meters from the north boundary and 500 meters from the west boundary of the section. The station is on the highest point of the ridge west of Breed Creek.

Station mark: A bronze disk set in a boulder.

Center IV (Montana, Liberty County; J. J. McArthur, 1908; 1917).—About one-half mile southwest of International Boundary Monument 359; in SE¼ sec. 3, T. 37 N., R. 4 E., principal meridian, about 100 meters from the east boundary of the section. The station is on the most western spur of the hill.

Station mark: A bronze disk set in a boulder.

Bear (Alberta, Medicine Hat District; J. J. McArthur, 1908).—About 1¾ miles north of International Boundary Monument 360; in NE¼ sec. 9, T. 1, R. 9 W., fourth meridian, about 400 meters from the east boundary of the section, and 100 meters from the midsection line. The station is on the highest part of the ridge.

Station mark: A bronze disk set in a boulder.

East Butte (Montana, Liberty County; J. J. McArthur, 1908).—About 7 miles south of the International Boundary; in SW¼ sec. 6, T. 36 N., R. 5 E., principal meridian. The station is on the most northern spur of East Butte.

Station mark: A bronze disk set in rock.

Center V (Montana, Liberty County; J. J. McArthur, 1908; 1917).—About one-half mile southeast of International Boundary Monument 363; in NE¼ sec. 2, T. 37 N., R. 5 E., principal meridian. The station is on the highest part of the east end of the hill.

Station mark: A bronze disk set in a boulder.

Laird (Montana, Liberty County; J. J. McArthur, 1908).—About 5¼ miles south of International Boundary Monument 364; in NW¼ sec. 36, T. 37 N., R. 5 E., principal meridian. The station is on the highest part of the east-and-west ridge.

Station mark: A bronze disk set in a rock.

Kop (Alberta, Medicine Hat District; J. J. McArthur, 1908).—About 2 miles north of International Boundary Monument 364; in the northwest corner of NW¼ sec. 10, T. 1, R. 8 W., fourth meridian. The station is on a prominent hill.

Station mark: A bronze disk set in rock.

Lost (Alberta, Medicine Hat District; J. J. McArthur, 1908).—About 1¼ miles northwest of International Boundary Monument 368; in NE¼ sec. 5, T. 1, R. 7 W., fourth meridian. The station is on the high part of the east end of the ridge and about one-half mile west of Lost Creek.

Station mark: A bronze disk set in a boulder.

Center VII (Montana, Liberty County; J. J. McArthur, 1908).—About 1 mile southeast of International Boundary Monument 370; in NE¼ sec. 9, T. 37 N., R. 7 E., principal meridian. The station is on the highest part of the ridge at the north boundary of the section.

Station mark: A bronze disk set in a boulder.

Christianson (Montana, Hill County; J. J. McArthur, 1908).—About 4½ miles south of International Boundary Monument 379; in SW¼ sec. 26, T. 37 N., R. 9 E., principal meridian; on the highest point. Station mark: A bronze disk set in a boulder.

Bar 5 (Alberta, Medicine Hat District; J. J. McArthur, 1908).—About 4 miles north of International Boundary Monument 380; in the northeast corner of NE½ sec. 20, T. 1, R. 4 W., fourth meridian. The station is on the noticeably high point west of the Lost River valley.

Station mark: A bronze disk set in a boulder.

Center IX (Montana, Hill County; J. J. McArthur, 1908).—In NE¼ sec. 3, T. 37 N., R. 10 E., principal meridian; about 300 meters south of the International Boundary, midway between Monuments 382 and 383. The station is about 1½ miles east of Milk River, on the hill near the boundary.

Station mark: A bronze disk set in a boulder.

Blacktail (Alberta, Medicine Hat District; J. J. McArthur, 1908).—About 4 miles north of International Boundary Monument 383; in SW¼ sec. 29, T. 1, R. 3 W., fourth meridian. The station is on a noticeably high point.

Station mark: A bronze disk set in a boulder.

Pugsley and Simpson (Montana, Hill County; J. J. McArthur, 1908).—About 2 miles south of International Boundary Monument 385; in SE¼ sec. 7, T. 37 N., R. 11 E., principal meridian. The station is on the highest part of the ridge.

Station mark: A bronze disk set in a boulder.

Center X (Alberta, Medicine Hat District; J. J. McArthur, 1908).—About 2 miles north of the International Boundary midway between Monuments 385 and 386; in NE½ sec. 11, T. 1, R. 3 W., fourth meridian, close to the north boundary of the section and about 200 meters from the midsection line. The station is on an isolated hill. Station mark: A bronze disk set in a boulder.

Hat (Alberta, Medicine Hat District; J. J. McArthur, 1908).—About 4½ miles north of International Boundary Monument 391; in SW½ sec. 29, T. 1, R. 1 W., fourth meridian. The station is on the highest point in the vicinity.

Station mark: A bronze disk set in a boulder.

Toledo (Montana, Hill County; J. J. McArthur, 1909).—About 5¼ miles south of International Boundary Monument 395; in NW¼ sec. 35, T. 37 N., R. 13 E., principal meridian. The station is on the highest part of the east-and-west ridge.

Station mark: A bronze disk set in a boulder.

Day (Saskatchewan, Maple Creek District; J. J. McArthur, 1909).—About 4½ miles north of International Boundary Monument 395; in SW¼ sec. 29, T. 1, R. 30 W., third meridian. The station is on the highest part of the east-and-west ridge.

Station mark: A bronze disk set in a boulder.

Center XI (Saskatchewan, Maple Creek District; J. J. McArthur, 1909).—About 1½ miles north of the International Boundary midway between Monuments 398 and 399; in E½ sec. 7, T. 1, R. 29 W., third meridian, close to the east-and-west midsection line. The station is on a hill north of a depression near the boundary. Station mark: A bronze disk set in a boulder.

Willow Creek (Saskatchewan, Maple Creek District; J. J. McArthur, 1909).—About 6 miles north of International Boundary Monument 400; in NW¼ sec. 34, T. 1, R. 29 W., third meridian. The station is on a prominent ridge east of Lodge Creek.

Station mark: A bronze disk set in a boulder.

Chinook (Montana, Hill County; J. J. McArthur, 1908).—See description of station "Signal."

Center XII (Saskatchewan, Maple Creek District; J. J. McArthur, 1909).—About 2½ miles northeast of International Boundary Monument 402; in SW¼ sec. 18, T. 1, R. 28 W., third meridian. The station is about 1½ miles northeast of the Royal Canadian Mounted Police post on Lodge Creek.

Station mark: A bronze disk set in a boulder.

Police (Montana, Hill County; J. J. McArthur, 1909; 1912).—About 4½ miles south of International Boundary Monument 404; in SE¼ sec. 30, T. 37 N., R. 16 E., principal meridian. The station is on a prominent knoll about 100 meters east of Lodge Creek.

Station mark: A bronze disk set in a boulder.

Maple (Saskatchewan, Maple Creek District; J. J. McArthur, 1909).—About 6½ miles north of International Boundary Monument 405; in SE½ sec. 2, T. 2, R. 28 W., third meridian. The station is close to the east end of a trail.

Station mark: A bronze disk set in a boulder.

Kirk (Montana, Hill County; J. J. McArthur, 1909; 1912).—About 4¼ miles south of International Boundary Monument 408; in NE¼ sec. 25, T. 37 N., R. 16 E., principal meridian. The station is on the east side of the top of the divide between Hay Coulee and the West Fork of Milk River.

Station mark: A bronze disk set in a boulder.

Kirk North Base (Montana, Hill County; O. B. French, 1912).—About 2½ miles south of the International Boundary midway between Monuments 406 and 407; close to the line between secs. 14 and 15, T. 37 N., R. 16 E., principal meridian, and about one-fourth mile from the north boundary of the sections. The station is on the divide between Hay Coulee and the west Fork of Milk River.

Station mark: A bronze disk set in a boulder, and a boulder marked by a cross 12 inches underground, directly under the surface mark.

Kirk South Base (Montana, Hill County; O. B. French, 1912).—About 4½ miles south of International Boundary Monument 407; near the midsection line of sec. 26, T. 37 N., R. 16 E., principal meridian. The station is on a small knoll.

Station mark: A bronze disk set in a boulder, and a boulder marked by a cross 10 inches underground and directly under the surface mark.

Todd (Saskatchewan, Maple Creek District; J. J. McArthur, 1909).—About 4½ miles north of International Boundary Monument 408; near the center of sec. 27, T. 1, R. 27 W., third meridian. The station is on a noticeably high point west of Woodpile Coulee.

Station mark: A bronze disk set in a boulder.

Center XIII (Saskatchewan, Maple Creek District; J. J. McArthur, 1909; 1917).—About 1½ miles north of International Boundary Monument 410; in SW½ sec. 12, T. 1, R. 27 W., third meridian. The station is on the highest point between Woodpile Coulee and the East Fork of Milk River.

Station mark: Probably a bronze disk set in a boulder.

Link (Montana, Blaine County; J. J. McArthur, 1909).—About 4 miles south of International Boundary Monument 415; near the north end of the boundary between secs. 27 and 28, T. 37 N., R. 18 E., principal meridian. The station is on the highest part of the north-and-south ridge.

Station mark: A bronze disk set in a boulder.

Shep (Montana, Blaine County; J. J. McArthur, 1909).—About one mile south of International Boundary Monument 415; in NE¼ sec. 9, T. 37 N., R. 18 E., principal meridian; on a high point near the north boundary of the section.

Station mark: A bronze disk set in a boulder.

Ryder (Saskatchewan, Maple Creek District; J. J. McArthur, 1909).—About 2¾ miles north of International Boundary Monument 415; in NW¼ sec. 13, T. 1, R. 26 W., third meridian. The station is on a noticeable elevation.

Station mark: A bronze disk set in a boulder.

318 (Montana, Blaine County; U. S. Geological Survey; International Boundary Commission, 1909).—Near the north boundary of NE¼ sec. 6, T. 37 N., R. 19 E., principal meridian; about 2.7 meters south of International Boundary Monument 418.

Station mark: A bench-mark pipe.

Strong (Saskatchewan, Maple Creek District; J. J. McArthur, 1909).—About 200 meters east of the middle of sec. 33, T. 1, R. 24 W., third meridian.

Station mark: A bronze disk set in a boulder.

Center XIV (Saskatchewan, Maple Creek District; J. J. McArthur, 1909).—About 250 meters north of the International Boundary and one-half mile west of Monument 439; in SE¼ sec. 5, T. 1, R. 20 W., third meridian. The station is on the highest part of the hill.

Station mark: A bronze disk set in a boulder.

Murray (Montana, Blaine County; J. J. McArthur, 1909).—About 2½ miles south of International Boundary Monument 440; in NE½, sec. 17, T. 37 N., R. 24 E., principal meridian. The station is near the middle of the quarter section.

Station mark: A bronze disk set in a boulder.

Telford (Saskatchewan, Maple Creek District; J. J. McArthur, 1909).—About 5 miles north of International Boundary Monument 440; in NW¼ sec. 26, T. 1, R. 20 W., third meridian. The station is on a high ridge.

Station mark: A bronze disk set in a boulder.

Avery (Montana, Blaine County; J. J. McArthur, 1909).—About 1½ miles southeast of International Boundary Monument 446; in NW½ sec. 11, T. 37 N., R. 25 E., principal meridian. The station is on the highest and most eastern part of an isolated hill.

Station mark: A bronze disk set in a boulder.

Tees (Saskatchewan, Maple Creek District; J. J. McArthur, 1909).—About 3¾ miles north of International Boundary Monument 447; in NE¼ sec. 19, T. 1, R. 18 W., third meridian. The station is about 200 meters from the north-and-south, and about 300 meters from the east-and-west, midsection lines.

Station mark: A bronze disk set in a boulder.

Harding (Saskatchewan, Maple Creek District; J. J. McArthur, 1909).—About 3 miles north of International Boundary Monument 449; in SW¼ sec. 23, T. 1, R. 18 W., third meridian. The station is about 200 meters from the south boundary of the section and about 100 meters from the midsection line.

Station mark: A bronze disk set in a boulder.

Betts (Montana, Blaine County; J. J. McArthur, 1909).—About 2 miles south of International Boundary Monument 449; in NE¼ sec. 16, T. 37 N., R. 26 E., principal meridian. The station is on the highest point in the vicinity.

Station mark: A bronze disk set in a boulder.

Raley (Saskatchewan, Maple Creek District; J. J. McArthur, 1909).—About 4½ miles north of International Boundary Monument 452; in SW½ sec. 27, T. 1, R. 17 W., third meridian. The station is about 300 meters from each of the midsection lines.

Station mark: A bronze disk set in a boulder.

White (Montana, Phillips County; J. J. McArthur, 1909).—About 3 miles south of International Boundary Monument 452; in SE¼ sec. 17, T. 37 N., R. 27 E., principal meridian. The station is on the highest part of the ridge.

Station mark: A bronze disk set in a boulder.

Cole (Saskatchewan, Maple Creek District; J. J. McArthur, 1909).—About 4½ miles north of the International Boundary, midway between Monuments 456 and 457; in SE¼ sec. 27, T. 1, R. 16 W., third meridian. The station is on the highest point east of Whitewater Creek.

Station mark: A bronze disk set in a boulder.

Snow (Montana, Phillips County; J. J. McArthur, 1909).—About 4¾ miles south of International Boundary Monument 457; in SE¼ sec. 28, T. 37 N., R. 28 E., principal meridian. The station is about 200 meters from the east boundary of the section, and about midway between the south boundary and the midsection line.

Station mark: A bronze disk set in a boulder.

Cory (Saskatchewan, Maple Creek District; J. J. McArthur, 1909).—About 4½ miles north of International Boundary Monument 463; in SW¼ sec. 29, T. 1, R. 14 W., third meridian. The station is on the highest point in the vicinity.

Station mark: A bronze disk set in a boulder.

Kerr (Montana, Phillips County; J. J. McArthur, 1909; 1912).—Nearly 1 mile south of International Boundary Monument 463; in SE¼ sec. 1, T. 37 N., R. 29 E., principal meridian. The station is on the approximately central knoll of several about 1 mile east of the northeast fork of Whitewater Creek; this knoll has a larger and

flatter top than most of the others. About 100 meters to the northeast is a knoll with a prominent white boulder on its top.

Station mark: A bronze disk set in a boulder.

Sowers (Montana, Phillips County; J. J. McArthur, 1909; 1912).—About 1¼ miles south of International Boundary Monument 466; in NE¼ sec. 10, T. 37 N., R. 30 E., principal meridian. The station is on a prominent knoll south of a ridge which extends to the International Boundary and is about one-half mile west of a hill with a prominent rock pile on it.

Station mark: A bronze disk set in a boulder.

Sowers Northwest Base (Montana, Phillips County; O. B. French, 1912; 1917).—About one-half mile southeast of International Boundary Monument 464; in NW¼ sec. 5, T. 37 N., R. 30 E., principal meridian. The station is on the more southeastern of two prominent knolls.

Station mark: A bronze disk set in a boulder and a boulder marked with a cross 14 inches underground and directly under the surface mark.

Sowers Southeast Base (Montana, Phillips County; O. B. French, 1912).—About 1% miles south of International Boundary Monument 464; near the center of sec. 8, T. 37 N., R. 30 E., principal meridian. The station is on the highest knoll in the vicinity.

Station mark: A bronze disk set in a boulder and a boulder marked with a cross about 1 foot underground and directly under the surface mark.

Waters (Saskatchewan, Maple Creek District; J. J. McArthur, 1909).—About 4¾ miles north of International Boundary Monument 467; in NW¼ sec. 30, T. 1, R. 13 W., third meridian, near the north-and-south midsection line. The station is on the highest point in the vicinity.

Station mark: A bronze disk set in a boulder.

Dunbar (Montana, Phillips County; J. J. McArthur, 1909; 1917).—Nearly 1 mile southwest of International Boundary Monument 473; in SE¼ sec. 6, T. 37 N., R. 32 E., principal meridian. The station is on a prominent bill

Station mark: Originally a bronze disk set in a boulder. In 1917 the bronze disk was found to have been removed from the boulder and the boulder pried out of the ground; the boulder was replaced in its original bed.

Walsh (Saskatchewan, Maple Creek District; J. J. McArthur, 1909).—About 2½ miles north of the International Boundary midway between Monuments 474 and 475; near the middle of sec. 14, T. 1, R. 12 W., third meridian. The station is on the highest point in the vicinity.

Station mark: A bronze disk set in a boulder.

Kennedy (Montana, Phillips County; J. J. McArthur, 1909; 1910).—About 5 miles south of International Boundary Monument 480. The station is on a flat-topped hill about 1 mile west of Frenchman Creek. Station mark: A bronze disk set in rock.

French (Saskatchewan, Maple Creek District; J. J. McArthur, 1909; 1910).—In NE¼ sec. 1, T. 1, R. 11 W., third meridian; about 1 mile northeast of International Boundary Monument 480. The station is on the high hill north of that section of the road which crosses the boundary near Monument 480, and is about one-half mile from the road, on the western spur of the hill.

Station mark: A bronze disk set in rock.

Moulstead (Saskatchewan, Maple Creek District; C. H. Sinclair, 1910; 1917).—In S½ sec. 1, T. 1, R. 10 W., third meridian, near the north-and-south midsection line; about 400 meters north of International Boundary Monument 484. The station is on the table land, one-half mile east of the bluff east of Frenchman Creek.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a concrete pier.

Lewis (Montana, Phillips County; C. H. Sinclair, 1910).—About 6 miles south of International Boundary Monument 484. The station is on the summit of the grassy flat-topped ridge about 2 miles east of Frenchman Creek.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a concrete pier.

N.286-A (Saskatchewan, Wood Mountain District; C. H. Sinclair, 1910).—In SE¼ sec. 4, T. 1, R. 9 W., third meridian; about 200 meters northwest of International Boundary Monument 486. The station is about 8 meters southwest of the steep slope to the coulee.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a concrete pier.

Grave (Montana, Valley County; C. H. Sinclair, 1910).—About 4½ miles south of the International Boundary midway between Monuments 486 and 487; on a high flat hill just north of a slightly higher hill. The station is near the west brow of the hill.

Station mark: A cairn over a bronze disk marked "U. S. & C. B. SURVEY" set in concrete.

Alkali (Saskatchewan, Wood Mountain District; C. H. Sinclair, 1910).—In NW¼ sec. 4, T. 1, R. 8 W., third meridian, near the west boundary of the section; about 1,100 meters northwest of International Boundary Monument 489. The station is on a prominent butte about 20 meters wide and 75 meters long, sloping gradually to the plain.

Station mark: A cairn over a bronze disk marked "U. S. & C. B. SURVEY" set in a mound of concrete on a flat rock. A drill hole is in the rock, directly under the center of the disk.

Rabbit (Montana, Valley County; C. H. Sinclair, 1910).—About 2 miles south of International Boundary Monument 490. The station is on a flat-topped hill.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a crown of concrete on a granite boulder. A drill hole in the rock is directly under the center of the disk.

S.282-A (Montana, Valley County; C. H. Sinclair, 1910).—On the divide between McEacheran and Horse Creeks. The station is south of the International Boundary, about 249 meters from Monument 493, and is on the same ridge as the monument.

Station mark: A bronze disk set in a concrete pier.

Sage (Saskatchewan, Wood Mountain District; C. H. Sinclair, 1910).—About 2½ miles north of the International Boundary midway between Monuments 493 and 494; in SW½ sec. 15, T. 1, R. 7 W., third meridian. The station is on a knoll with a slight bluff to the westward.

Station mark: A cross chiseled on a granite boulder.

Creek (Saskatchewan, Wood Mountain District; C. H. Sinclair, 1910).—About 1 mile north of International Boundary Monument 495; in NE¼ sec. 1, T. 1, R. 7 W., third meridian. The station is about one-half mile east of Horse Creek, on a knob with a bluff on the north side.

Station mark: Probably a cross or drill hole in rock.

Hay (Montana, Valley County; C. H. Sinclair, 1910).—About 2 miles south of International Boundary Monument 496. The station is on a flat-topped rise of land about one-half mile east of Rock Creek.

Station mark: A drill hole and a triangle in a granite boulder.

Rocky (Saskatchewan, Wood Mountain District; C. H. Sinclair, 1910).—About 2½ miles north of International Boundary Monument 497; in SE½ sec. 17, T. 1, R. 6 W., third meridian. The station is on a butte covered with granite boulders and outcroppings. A cairn is about 27 meters distant to the north.

Station mark: A drill hole and a triangle in a granite boulder.

S.280 (Montana, Valley County; C. H. Sinclair, 1910).—About 1 mile east of Rock Creek. The station is on the same hill and 273 meters southeast of International Boundary Monument 497.

Station mark: A drill hole and a triangle in a granite boulder.

Rocky Creek North Base (Saskatchewan, Wood Mountain District; C. H. Sinclair, 1910).—About 1½ miles northwest of International Boundary Monument 496; in SW½ sec. 7, T. 1, R. 6 W., third meridian. The station is on a rounded knoll about one-half mile east of Horse Creek.

Station mark: A bronze disk set in a concrete pier nearly flush with the ground.

Rocky Creek South Base (Montana, Valley County; C. H. Sinclair, 1910).—About three-fourths mile west of the point where Rocky Creek crosses the International Boundary, one-fourth mile north of the curve of the creek to the south. The station is on the top of a hill and is about 148 meters southwest of Monument 496. Station mark: A bronze disk set in a concrete pier nearly flush with the ground.

Iron (Montana, Valley County; C. H. Sinclair, 1910).—About 1½ miles southeast of International Boundary Monument 499, on the same ridge as the monument. The station is on the highest and more southern of two knobs. The knob is covered with red rock.

Station mark: A drill hole and a triangle in a red rock nearly flush with the ground.

Smoky (Saskatchewan, Wood Mountain District; C. H. Sinclair, 1910).—About 1½ miles north of International Boundary Monument 501; in NW¼ sec. 8, T. 1, R. 5 W., third meridian. The station is on a rounded east-and-west ridge on the north side of Morgan Creek. It is near the east-and-west midsection line.

Station mark: A drill hole and a triangle in a granite boulder.

Cone (Montana, Valley County; C. H. Sinclair, 1910).—About 2½ miles south of the International Boundary midway between Monuments 502 and 503. The station is on a conical hill, well defined and standing alone, about 1 mile south of the south branch of Morgan Creek.

Station mark: A drill hole and a triangle in a granite boulder nearly flush with the ground.

Burnt (Saskatchewan, Wood Mountain District; C. H. Sinclair, 1910).—Nearly 1 mile north of International Boundary Monument 504; in NE¼ sec. 1, T. 1, R. 5 W., third meridian. The station is on a hill near the head of the south branch of Morgan Creek.

Station mark: A drill hole in a triangle in a granite boulder nearly flush with the ground—the only rock on the hill.

Gravel (Montana, Valley County; C. H. Sinclair, 1910).—About 2¾ miles south of International Boundary Monument 504. The station is on a small rounded hill between two branches of the south branch of Morgan Creek. The hill is covered with gravel.

Station mark: A drill hole and a triangle in a granite boulder nearly flush with the ground.

N.276 (Saskatchewan, Wood Mountain District; C. H. Sinclair, 1910).—In the southwest corner of SW¼ sec. 5, T. 1, R. 4 W., third meridian, 87.4 meters northwest of International Boundary Monument 505. The station is on the ridge forming the eastern limit of the watershed of the south branch of Morgan Creek.

Station mark: A drill hole in a granite boulder.

Mound (Montana, Valley County; C. H. Sinclair, 1910).—Nearly 2 miles south of the International Boundary midway between Monuments 506 and 507; about 5½ miles west of the West Branch of Poplar River, and on western edge of the plateau. The station is on a knoll resembling a mound.

Station mark: A drill hole and triangle in a granite boulder.

Fox (Montana, Valley County; C. H. Sinclair, 1910).—About 1 mile south of International Boundary Monument 507; on the northeast edge of the plateau about 3½ miles west of the West Branch of Poplar River. Station mark: A drill hole and triangle in a granite boulder nearly flush with the ground.

Kid (Montana, Valley County; C. H. Sinclair, 1910).—About 3 miles south of the International Boundary midway between Monuments 507 and 508; on the southeast edge of the plateau about 4 miles west of the West Branch of Poplar River.

Station mark. A drill hole and triangle in a red granite boulder.

Badger (Saskatchewan, Wood Mountain District; C. H. Sinclair, 1910).—About 2 miles east of the West Branch of Poplar River; in SE¼ sec. 3, T. 1, R. 3 W., third meridian. The station is on a knoll about 600 meters north of International Boundary Monument 510.

Station mark: A drill hole and triangle in a granite boulder.

Branch (Montana, Valley County; C. H. Sinclair, 1910).—About 2 miles south of International Boundary Monument 511; on the east side of the West Branch of Poplar River, where the river makes a decided bend to the northeast and back to the southwest. The station is on a hill just north of a ranch.

Station mark: A drill hole and a triangle in a granite boulder nearly flush with the ground.

Brace (Saskatchewan, Wood Mountain District; C. H. Sinclair, 1910).—About 1¾ miles northwest of International Boundary Monument 513; in NE¼ sec. 8, T. 1, R. 2 W., third meridian. The station is on the west edge of the plateau.

Station mark: A bronze disk set in a gray sandstone boulder nearly flush with the ground.

Coal (Montana, Valley County; C. H. Sinclair, 1910).—About 400 meters west of International Boundary Monument 514. The station is on the west edge of the plateau.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a gray sandstone boulder nearly flush with the ground.

Slim (Saskatchewan, Wood Mountain District; C. H. Sinclair, 1910).—About 3 miles north of International Boundary Monument 515; in SE¼ sec. 23, T. 1, R. 2 W., third meridian, about 100 meters from the south boundary and 300 meters from the east boundary of the section. The station is on the plateau between Coal and Lost Child Creeks.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a concrete pier nearly flush with the ground.

Jeff (Saskatchewan, Wood Mountain District; C. H. Sinclair, 1910).—About 1¾ miles northeast of International Boundary Monument 515 and 1¼ miles in the same direction from Coal Creek. The station is on the plateau between Coal and Lost Child Creeks.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a concrete pier nearly flush with the ground.

Windy (Montana, Valley County; C. H. Sinclair, 1910).—About 1½ miles south of International Boundary Monument 515; on the north edge of the bench forming the south side of Coal Creek valley.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a concrete pier nearly flush with the ground.

Kick (Saskatchewan, Wood Mountain District; C. H. Sinclair, 1910).—About 1% miles north of the International Boundary midway between Monuments 516 and 517; in the southeast corner of NE¼ sec. 7, T. 1, R. 1 W., third meridian. The station is on the bench forming the north side of Coal Creek valley.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a concrete pier.

Noon (Montana, Valley County; C. H. Sinclair, 1910).—Nearly 1½ miles southwest of International Boundary Monument 517; on the north edge of the tableland forming the south side of Coal Creek valley. The station is on a small knoll projecting into the valley.

Station mark: A bonze disk marked "U. S. & C. B. SURVEY" set in a concrete pier.

Bostick (Montana, Daniels County; C. H. Sinclair, 1910).—About 2½ miles southwest of International Boundary Monument 519; on the north edge of the tableland forming the south side of Coal Creek valley.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a concrete pier nearly flush with the ground.

N.268 (Saskatchewan, Wood Mountain District; C. H. Sinclair, 1910).—In SW¼ sec. 2, T. 1, R. 1 W. third meridian; on a rise on the flats between Coal and Lost Child Creeks. The station is about 600 meters north of International Boundary Monument 519.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a concrete pier nearly flush with the ground.

N.267 (Saskatchewan, Wood Mountain District; C. H. Sinclair, 1910; 1912).—In SE¼ sec. 5, T. 1, R. 30 W., second meridian; about 700 meters northeast of International Boundary Monument 521 and 350 meters from the boundary; near the east boundary of the section.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a concrete pier nearly flush with the ground.

Green (Montana, Daniels County; C. H. Sinclair, 1910; 1912).—About 2 miles southwest of International Boundary Monument 522, on a small rounded hill on the north side of Coal Creek valley. The hill slopes gently to the west and northwest and steeply toward the east and north.

Station mark: A bronze disk set in a concrete pier.

Black=Green North Base (Montana, Daniels County; C. H. Sinclair, 1910; 1912).—On the north edge of the flat forming the southern limit of Lost Child Creek valley; about 500 meters south of International Boundary Monument 522.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a concrete pier nearly flush with the ground.

Green South Base (Montana, Daniels County; O. B. French, 1912).—About 1¼ miles southeast of International Boundary Monument 522. The station is on a very slight rise in the middle of a large plain, about 200 meters north of a low ridge.

Station mark: An iron pipe one-half inch in diameter and 1 foot below the surface of the ground. Immediately above it is a bronze disk. Above that is a piece of galvanized iron 10 by 15 inches in size with its edges about 6 inches below the surface of the ground but so folded that about 6 inches of its middle is exposed.

Nick (Montana, Daniels County; C. H. Sinclair, 1910).—About 1½ miles southwest of International Boundary Monument 524, near the south end of the bench between Coal and Lost Child Creeks. The station is on a slight rise of ground.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a concrete pier.

Sod (Saskatchewan, Wood Mountain District; C. H. Sinclair, 1910).—One-half mile northwest of International Boundary Monument 524; in SE¼ sec. 1, T. 1, R. 30 W., second meridian. The station is on the ridge that juts northward into Lost Child Creek valley, and is about 150 meters south of the north extremity of the ridge.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a concrete pier.

Mud (Montana, Daniels County; C. H. Sinclair, 1911).—About 100 meters south of the International Boundary, 500 meters east of Monument 525; on an east-and-west ridge. The station is about 8 meters south of the steep slope of the ridge.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a concrete pier.

Child (Montana, Daniels County; C. H. Sinclair, 1911).—About 3 miles south of International Boundary Monument 527; on the highest part of a ridge one-half mile south of Coal Creek.

Station mark: A bronze disk set in concrete.

Lost (Saskatchewan, Wood Mountain District; C. H. Sinclair, 1910).—About 2% miles north of International Boundary Monument 527; 72 meters northwest of the quarter-section corner on the east line of sec. 14, T. 1, R. 29 W., second meridian.

Station mark: A bronze disk set in a concrete pier.

Harris (Montana, Daniels County; C. H. Sinclair, 1911).—About three-fourths mile southeast of International Boundary Monument 527; one-half mile south of the upper crossing of the International Boundary by Lost Child Creek. The station is on the north edge of the ridge.

Station mark: A cairn over a bronze disk set in a concrete pier.

Middle (Saskatchewan, Wood Mountain District; C. H. Sinclair, 1911).—About 1 mile north of the International Boundary midway between Monuments 530 and 531 at a point where the boundary is crossed by a well defined valley; near the north boundary of NE¼ sec. 3, T. 1, R. 28 W, second meridian. The station is about 140 meters southeast of the top of the ridge.

Station mark: A bronze disk set in a concrete pier.

Fork (Montana, Daniels County; C. H. Sinclair, 1911).—About three-fourths mile southwest of International Boundary Monument 531; on the east side of the valley that crosses the International Boundary midway between Monuments 530 and 531. The station is on the most northern of three low hills.

Station mark: A bronze disk set in a concrete pier.

Scobey (Montana, Daniels County; C. H. Sinclair, 1911).—About one-half mile southeast of International Boundary Monument 532. The station is on the highest part of the ridge.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a concrete pier.

Break (Montana, Daniels County; C. H. Sinclair, 1911).—About one-half mile south of International Boundary Monument 533. The station is on a flat-topped hill and is about 50 meters south of the head of a deep draw that slopes to the southwest.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a concrete pier.

Knoll (Saskatchewan, Wood Mountain District; C. H. Sinclair, 1911).—About 1½ miles north of International Boundary Monument 534; near the west boundary of sec. 9, T. 1, R. 27 W., second meridian, and near the east-and-west midsection line. The station is on the more southern of two detached knolls.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a concrete pier. One reference mark is a hammer mark on a stone 19.26 meters from the station in azimuth 135°. A second reference mark is a hammer mark on a stone 9.5 meters from the station in azimuth 180°. A third reference mark is a hammer mark on a stone 7.38 meters from the station in azimuth 270°.

Pole (Montana, Daniels County; C. H. Sinclair, 1911).—About 1¼ miles southwest of International Boundary Monument 535, on the west side of a valley which extends northwestward across the boundary. The station is on a small gravel ridge.

Station mark: A mound of stones 5 feet in diameter over a bronze disk marked "U. S. & C. B. SURVEY" buried 5 inches in the ground.

Din (Saskatchewan, Wood Mountain District; C. H. Sinclair, 1911).—About 1 mile north of International Boundary Monument 535; in the northwest corner of NW¼ sec. 2, T. 1, R. 27 W., second meridian. The station is on a large mound. East about 200 meters from the station is a hump on which are an Indian grave and a 3-foot cairn.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a concrete pier. One reference mark is an arrow on a granite boulder 12.58 meters from the station in azimuth 215°. A second reference mark is a crossed arrow on a sandstone boulder 4.47 meters from the station in azimuth 5°. A third reference mark is a cross on a crumbling quartz boulder 10.33 meters from the station in azimuth 70°.

Coy (Montana, Daniels County; C. H. Sinclair, 1911).—On a ridge, south about 300 meters from, and approximately at the same elevation as, International Boundary Monument 535.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a concrete pier. One reference mark is a cairn 4.35 meters from the station in azimuth 280°. A second reference mark is a cross in a gray rock 8.51 meters from the station in azimuth 265° A third reference mark is a crossed arrow on a partly buried red disk-shaped rock 7.85 meters from the station in azimuth 105°. A fourth reference mark is an arrow on a black rock 7.79 meters from the station in azimuth 45°.

Nice (Montana, Daniels County; C. H. Sinclair, 1911).—About 1\% miles south of International Boundary Monument 536, on a small knoll on the ridge that leads down from the monument. It is about 3 miles west of the East Fork of Poplar River.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a concrete pier. One reference mark is a cross on a yellow stone 19.55 meters from the station in azimuth 110°. A second reference mark is an arrow on a crumbling granite boulder 5.64 meters from the station in azimuth 180°. A third reference mark is a crossed arrow on a stone 2.77 meters from the station in azimuth 345°.

Fee (Saskatchewan, Wood Mountain District; C. H. Sinclair, 1911).—About 1½ miles north of International Boundary Monument 538; in S½ sec. 9, T. 1, R. 26 W., second meridian, near the north-and-south midsection line. The station is about 80 meters east of the East Fork of Poplar River about 250 meters northeast of some homestead buildings. It is on a gravel hump approximately 20 feet above the general elevation.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a concrete pier.

Har (Montana, Daniels County; C. H. Sinclair, 1911).—About 1¼ miles southwest of International Boundary Monument 359, and about one-half mile east of the East Fork of Poplar River. The station is on a flat-topped hill.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a concrete pier.

Ray=Ogden Northwest Base (Saskatchewan, Wood Mountain District; C. H. Sinclair, 1911; 1912).—About one-fourth mile northwest of International Boundary Monument 540; in SE¼ sec. 2, T. 1, R. 26 W., second meridian. The station is on the highest knoll in the vicinity.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a concrete pier. The reference mark is a crossed arrow on a granite boulder 4.45 meters from the station in azimuth 245°.

Fil (Saskatchewan, Wood Mountain District; C. H. Sinclair, 1911).—About 1¼ miles north of International Boundary Monument 540; in SW¼ sec. 12, T. 1, R. 26 W., second meridian. The station is on the middle one of several small mounds which form a ridge extending north-northeastward.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a concrete pier. One reference mark is a crossed arrow on a granite boulder 9.395 meters from the station in azimuth 20°. A second reference mark is an arrow on a granite boulder 5.87 meters from the station in azimuth 155°. A third reference mark is a cross on a granite boulder 9.37 meters from the station in azimuth 340°.

Ogden=Ogden Southeast Base (Montana, Daniels County; C. H. Sinclair, 1911).—About three-fourths mile southeast of International Boundary Monument 540, on the same ridge as the monument. The station is on a flat-topped knoll at the end of the ridge.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a concrete pier. One reference mark is a crossed arrow on a bluish granite boulder 3.16 meters from the station in azimuth 60°. A second reference mark is an arrow on a white rock 8.7 meters from the station in azimuth 80°. A third reference mark is a cross on a quartz and granite boulder 14.18 meters from the station in azimuth 198°.

Neil (Saskatchewan, Wood Mountain District; C. H. Sinclair, 1911).—About 1½ miles northeast of International Boundary Monument 543; in SE¼ sec. 10, T. 1, R. 25 W., second meridian, near the east boundary of the section. The station is on a flat-topped hill.

Station mark: A cairn over a bronze disk marked "U. S. & C. B. SURVEY" set in a concrete pier

Merril (Montana, Daniels County; C. H. Sinclair, 1911).—About 1¼ miles southwest of International Boundary Monument 544. The station is on a flat-topped hill about one-half mile south of a rocky bluff 1 mile southwest of the monument.

Station mark: A small cairn over a bronze disk marked "U. S. & C. B. SURVEY" set in a concrete pier.

Hearst (Montana, Daniels County; C. H. Sinclair, 1911).—About 1 mile southeast of International Boundary Monument 546, on the ridge tending in a southerly direction that crosses the boundary a little east of the monument. The station is on a low round-topped hill, about one-fourth mile southeast of a slightly higher rocky hill.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a concrete pier.

Spring (Saskatchewan, Wood Mountain District; C. H. Sinclair, 1911).—About 1¼ miles north of the International Boundary midway between Monuments 546 and 547; in SW¼ sec. 9, T. 1, R. 24 W., second meridian, near the west boundary of the township, on the high ridge north of the west fork of Beaver Creek. The station is on the highest knob of the ridge and is about 1 mile north of the creek.

Station mark: A small cairn over a bronze disk marked "U. S. & C. B. SURVEY" set in a concrete pier.

Pull (Saskatchewan, Wood Mountain District; C. H. Sinclair, 1911).—About one-third mile north of International Boundary Monument 548; in SW¼ sec. 2, T. 1, R. 24 W., second meridian. The station is on the most southern of the nearby hills.

Station mark: A cairn over a bronze disk marked "U. S. & C. B. SURVEY" set in a concrete pier.

Pebble (Montana, Daniels County; C. H. Sinclair, 1911).—A little over 1 mile south of the International Boundary midway between Monuments 548 and 549. The station is on the south end of the ridge tending southwestward from the boundary.

Station mark: A small cairn over a bronze disk marked "U. S. & C. B. SURVEY" set in a concrete pier.

Beaver (Montana, Sheridan County; C. H. Sinclair, 1911).—About 1½ miles south of International Boundary Monument 550; in NE¼ sec. 7, T. 37 N., R. 51 E., principal meridian. The station is on a rocky ridge, about one-third mile west of Beaver Creek, at a point where the creek turns eastward, then northward, and then eastward again.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a mass of concrete. One reference mark is a cross on a rock 15.09 meters from the station in azimuth 20°. A second reference mark is an arrow on a flat-topped square rock 3.77 meters from the station in azimuth 150°. A third reference mark is a crossed arrow on a rock 6.11 meters from the station in azimuth 275°.

Robinson (Montana, Sheridan County; C. H. Sinclair, 1911).—About 1½ miles south of the International Boundary midway between Monuments 553 and 554; in NE½ sec. 12, T. 37 N., R. 51 E., principal meridian, near the north boundary of the section. The station is on a prominent knoll.

Station mark: A cairn over a bronze disk marked "U. S. & C. B. SURVEY" set in concrete.

Pasture (Saskatchewan, Wood Mountain District; C. H. Sinclair, 1911).—About 2½ miles northwest of International Boundary Monument 554; in SE¼ sec. 18, T. 1, R. 22 W., second meridian. The station is on the more southern of two peaks on a prominent ridge.

Station mark: A cairn over a bronze disk marked "U. S. & C. B. SURVEY" set in concrete.

Giles (Saskatchewan, Wood Mountain District; C. H. Sinclair, 1911).—About 2 miles north of International Boundary Monument 556; in the southwest corner of NE½ sec. 14, T. 1, R. 22 W., second meridian. The station is on the top of the highest knoll of the ridge east of Big Muddy River and north of Carlisle Coulee.

Station mark: A small cairn over a bronze disk marked "U. S. & C. B. SURVEY" set in concrete.

Zemper (Montana, Sheridan County; C. H. Sinclair, 1911).—About three-fourths mile east of International Boundary Monument 557 and approximately 200 meters south of the boundary; in NW¼ sec. 6, T. 37 N., R. 53 E., principal meridian. The station is on the first ridge east of the monument and is about 5 meters south of a large rock pile on the edge of a cultivated field.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a mass of concrete.

Look (Saskatchewan, Weyburn District; C. H. Sinclair, 1911).—About one-half mile north of the International Boundary midway between Monuments 557 and 558; in SW¼ sec. 5, T. 1, R. 21 W., second meridian. The station is on the ridge on the east side and near the source of a deep brushy valley running northwest to Carlisle Coulee.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a mass of concrete.

Carlisle (Saskatchewan, Weyburn District; C. H. Sinclair, 1911).—About 2¾ miles north of International Boundary Monument 558; in N½ sec. 17, T. 1, R. 21 W., second meridian, near the north-and-south midsection line. The station is on a flat ridge about three-fourths mile north of the wagon road from Big Muddy Creek. A coulee leads up to the ridge near where the road turns sharply to the northeast.

Station mark: A cairn over a bronze disk marked "U. S. & C. B. SURVEY" set in concrete.

Johnson (Montana, Sheridan County; C. H. Sinclair, 1911).—About 300 meters southeast of International Boundary Monument 558; in NE¼ sec. 5, T. 37 N., R. 53 E., principal meridian. The station is on the flat bench crossing the boundary. A deep gully lies just west of the station.

Station mark: A cairn over a bronze disk marked "U. S. & C. B. SURVEY" set in concrete.

Out (Saskatchewan, Weyburn District; C. H. Sinclair, 1911).—About one-fourth mile east of International Boundary Monument 560, and 100 meters north of the boundary; in SE¼ sec. 3, T. 1, R. 21 W., second meridian. The station is on a low knob which is the only point in the vicinity where a station could be established to see through the valley to the northwest.

Station mark: A cairn over a bronze disk marked "U. S. & C. B. SURVEY".

Lump (Saskatchewan, Weyburn District; C. H. Sinclair, 1911).—About 1¾ miles north of International Boundary Monument 560; in NW¼ sec. 11, T. 1, R. 21 W., second meridian. The station is on a well defined knob, the only point in the vicinity from which the high ridge along the boundary and the flat country to the east can be seen.

Station mark: A bronze disk set in concrete.

Guard (Saskatchewan, Weyburn District; C. H. Sinclair, 1911).—In SW¼ sec. 6, T. 1, R. 20 W., second meridian. The station is about 70 meters north of the International Boundary, on a small hill about midway between Monuments 561 and 562.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in concrete.

Rose (Saskatchewan, Weyburn District; C. H. Sinclair, 1911).—About 2½ miles northwest of International Boundary Monument 562; in SE½ sec. 18, T. 1, R. 20 W., second meridian. The station is on the southeast point of a low ridge.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in concrete.

Rood (Saskatchewan, Weyburn District; C. H. Sinclair, 1911).—About 2½ miles north of International Boundary Monument 563; in W½ sec. 16, T. 1, R. 20 W., second meridian, near the east-and-west midsection line. The station is on a high ridge over which a road crosses about one-fourth mile to the north.

Station mark: A small cairn over a bronze disk marked "U. S. & C. B. SURVEY" set in concrete.

In (Saskatchewan, Weyburn District; C. H. Sinclair, 1911).—About one-third mile northwest of International Boundary Monument 563; in SE¼ sec. 5, T. 1, R. 20 W., second meridian. The station is on a low ridge, slightly higher than the surrounding hills.

Station mark: A small cairn over a bronze disk marked "U. S. & C. B. SURVEY" set in concrete.

Fly (Saskatchewan, Weyburn District; C. H. Sinclair, 1911).—About one-fourth mile northeast of International Boundary Monument 564; in SE¼ sec. 3, T. 1, R. 20 W., second meridian. The station is on a low but very prominent hill.

Station mark: A small cairn over a bronze disk marked "U. S. & C. B. SURVEY" set in concrete.

Berry (Montana, Sheridan County; C. H. Sinclair, 1911).—About one-half mile southwest of International Boundary Monument 565; in NW¼ sec. 2, T. 37 N., R. 54 E., principal meridian. The station is on a low bench just above a meadow.

Station mark: A small cairn over a bronze disk marked "U. S. & C. B. SURVEY" set in concrete.

Wild (Saskatchewan, Weyburn District; C. H. Sinclair, 1911).—About 1¾ miles northeast of International Boundary Monument 565; in NW¼ sec. 12, T. 1, R. 20 W., second meridian; on a ridge on the southwest side of a very deep, long coulee. The station is on the east and highest point of the ridge.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in concrete.

View (Montana, Sheridan County; C. H. Sinclair, 1911).—About 1½ miles south of International Eoundary Monument 567; in NW½ sec. 8, T. 37 N., R. 55 E., principal meridian. The station is on the higher of two knolls forming a ridge lying north and south.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in concrete.

Man (Saskatchewan, Weyburn District; C. H. Sinclair, 1911).—About 1¾ miles northwest of International Boundary Monument 568; in NE¼ sec. 9, T. 1, R. 19 W., second meridian. The station is on the top of a very prominent hill, known locally as Wild Man's Butte. It is near the east end of a large alkali lake.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in concrete.

White (Saskatchewan, Weyburn District; C. H. Sinclair, 1911).—About three-fourths mile north of International Boundary Monument 570; in NW¼ sec. 1, T. 1, R. 19 W., second meridian. The station is on the first bench above the alkali lake just east of Wild Man's Butte.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in concrete.

Chap (Montana, Sheridan County; C. H. Sinclair, 1911).—About 1¾ miles south of International Boundary Monument 570; in SE¼ sec. 11, T. 37 N., R. 55 E., principal meridian. The station is on a prominent round-topped hill.

Station mark: A cairn over a bronze disk marked "U. S. & C. B. SURVEY" set in concrete.

Thompson (Saskatchewan, Weyburn District; C. H. Sinclair, 1911).—About one-half mile northwest of International Boundary Monument 573; in SW¼ sec. 3, T. 1, R. 18 W., second meridian. The station is on a high tableland.

Station mark: A cairn over a bronze disk marked "U. S. & C. B. SURVEY" set in concrete.

Blondie (Montana, Sheridan County; C. H. Sinclair, 1911).—About 2½ miles south of International Boundary Monument 573; in SW½ sec. 10, T. 37 N., R. 56 E., principal meridian. The station is on an isolated knob.

Station mark: A cairn over a bronze disk marked "U. S. & C. B. SURVEY" set in concrete.

Round (Montana, Sheridan County; C. H. Sinclair, 1911).—About 1 mile southwest of International Boundary Monument 576; in SE¼ sec. 6, T. 37 N., R. 57 E., principal meridian. The station is on a prominent low hill on the ridge tending southerly from the boundary.

Station mark: A cairn over a bronze disk marked "U. S. & C. B. SURVEY" set in concrete.

Knute (Montana, Sheridan County; C. H. Sinclair, 1911).—About 3 miles south of International Boundary Monument 579; in SW¼ sec. 14, T. 37 N., R. 57 E., principal meridian. The station is on the highest hill in the vicinity.

Station mark: A cairn over a bronze disk marked "U. S. & C. B. SURVEY" set in concrete. The witness mark is a crossed arrow on a large white granite boulder 3.75 meters from the station, in azimuth 225°.

Knute South Base (Montana, Sheridan County; O. B. French, 1912).—About 3 miles southwest of International Boundary Monument 580; in SW¼ sec. 13, T. 37 N., R. 57 E., principal meridian. The station is on a high, round hill, about 200 meters south of the corner of a fence. There is a similar hill about one-fourth mile south. The country to the west has hills about as high as the station and the country to the east is lower.

Station mark: A cross on a boulder in place, about 2 inches above the surface of the ground.

Knute North Base (Montana, Sheridan County; O. B. French, 1912).—About 2 miles southwest of International Boundary Monument 580; in SW¼ sec. 12, T. 37 N., R. 57 E., principal meridian. The station is on one of the many small hills in the vicinity. There is a higher hill in a northeasterly direction.

Station mark: A drill hole and a triangle on a large flat boulder flush with the surface of the ground. The subsurface mark is a cross on a boulder 1½ feet underground. The reference mark is a small white limestone boulder placed edgewise, 1.18 meters from the station in azimuth 285°.

Finley (Montana, Sheridan County; C. H. Sinclair, 1911).—About 2½ miles south of the International Boundary midway between Monuments 581 and 582, near the corner of secs. 8, 9, 16, and 17, T. 37 N., R. 58 E., principal meridian. The station is on a very prominent hill on a high, rolling ridge.

Station mark: A cairn over a bronze disk marked "U. S. & C. B. SURVEY" set in concrete.

Deal (Saskatchewan, Weyburn District; C. H. Sinclair, 1911).—About two-thirds mile north of International Boundary Monument 582; in NW¼ sec. 3, T. 1, R. 16 W., second meridian. The station is on a flat-topped hill. Station mark: A cairn over a bronze disk marked "U. S. & C. B. SURVEY" set in concrete.

Fine (North Dakota, Divide County; C. H. Sinclair, 1911).—About 2¾ miles south of International Boundary Monument 586; near the west boundary and the east-and-west midsection line of sec. 8, T. 163 N., R. 102 W., fifth principal meridian. The station is 2½ miles southwest of Skermo post office, on a high flat-topped, detached hill.

Station mark: A cairn over a bronze disk marked "U. S. & C. B. SURVEY" set in concrete."

Foster (Saskatchewan, Weyburn District; C. H. Sinclair, 1911).—About one-half mile north of the International Boundary midway between Monuments 586 and 587; in SE¼ sec. 4, T. 1, R. 15 W., second meridian. The station is on a high, flat ridge overlooking a valley to the northwest. It is adajcent to, and on the south side of, a cultivated field.

Station mark: A cairn over a bronze disk marked "U. S. & C. B. SURVEY" set in concrete.

Flew (Saskatchewan, Weyburn District; C. H. Sinclair, 1911).—In the southwest corner of SW¼ sec. 5, T. 1, R. 14 W., second meridian. The station is 154 meters northwest of International Boundary Monument 589 and about 100 meters north of the boundary, on a high, narrow ridge.

Station mark: A cairn over a bronze disk marked "U. S. & C. B. SURVEY" set in concrete.

Skermo (North Dakota, Divide County; C. H. Sinclair, 1911).—About 3 miles southeast of International-Boundary Monument 590; in SE½ sec. 9, T. 163 N., R. 101 W., fifth principal meridian. The station is on the highest hill on the high ridge east of Skermo post office.

Station mark: A cairn over a bronze disk marked "U. S. & C. B. SURVEY" set in concrete.

Fled (Saskatchewan, Weyburn District; C. H. Sinclair, 1911).—In SE¼ sec. 2, T. 1, R. 14 W., second meridian; about 300 meters northeast of International Boundary Monument 591. The station is on a knoll, slightly higher than the monument.

Station mark: A cairn over a bronze disk marked "U. S. & C. B. SURVEY" set in concrete.

Olsen (Saskatchewan, Weyburn District; C. H. Sinclair, 1911).—About one-third mile north of the International Boundary midway between Monuments 593 and 594; in SE¼ sec. 5, T. 1, R. 13 W., second meridian. The station is on a prominent knoll.

Station mark: A cairn over a bronze disk marked "U. S. & C. B. SURVEY" set in concrete.

Brown (North Dakota, Divide County; C. H. Sinclair, 1911).—About 2¾ miles southwest of International Boundary Monument 394; near the center of sec. 8, T. 163 N., R. 100 W., fifth principal meridian. The station is on a low knoll about 250 meters from a house.

Station mark: A cairn over a bronze disk marked "U. S. & C. B. SURVEY" set in concrete.

Ruin (North Dakota, Divide County; C. H. Sinclair, 1911).—About 1% miles southeast of International Boundary Monument 595; in NE¼ sec. 3, T. 163 N., R. 100 W., fifth principal meridian. The station is on a flat about 50 meters east of a small valley which lies north and south.

Station mark: A cairn over a bronze disk marked "U. S. & C. B. SURVEY" set in concrete.

Gopher (Saskatchewan, Weyburn District; C. H. Sinclair, 1911).—About 10 meters north of the International Boundary approximately midway between Monuments 595 and 596; in SE¼ sec. 2, T. 1, R. 13 W., second meridian. The station is near the south end of a small hill.

Station mark: A small cairn over a bronze disk marked "U. S. & C. B. SURVEY" set in concrete.

Hagen (Saskatchewan, Weyburn District; C. H. Sinclair, 1911).—About two-thirds mile north of International Boundary Monument 598; in NE¼ sec. 5, T. 1, R. 12 W., second meridian; near the road on the east boundary of the section and about 200 meters north of the east-and-west midsection line.

Station mark: A cairn over a bronze disk marked "U. S. & C. B. SURVEY" set in concrete.

Ledge (North Dakota, Divide County; C. H. Sinclair, 1911).—About 1¼ miles south of International Boundary Monument 598; near the south boundary of sec. 32, T. 164 N., R. 99 W., fifth principal meridian, close to the north-and-south midsection line. The station is northwest of, and close to a large rock.

Station mark: A cairn over a bronze disk marked "U. S. & C. B. SURVEY" set in concrete close to the ground.

Ambrose (North Dakota, Divide County; C. H. Sinclair, 1911).—About 1½ miles southeast of International Boundary Monument 600; in NW¼ sec. 2, T. 163 N., R. 99 W., fifth principal meridian. The station is on a small rise in an open, grassy prairie.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a concrete pier.

School (North Dakota, Divide County; C. H. Sinclair, 1911).—See description of "Ambrose Northeast Base."

Jasper (North Dakota, Divide County; C. H. Sinclair, 1911).—About 7½ miles south of International Boundary Monument 595; in NW¼ sec. 3, T. 162 N., R. 100 W., fifth principal meridian. The station is about 2½ miles nearly due south of Colgan post office, on a rounded knoll of the range of hills lying east and west.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in concrete. A few large boulders are about 2 meters to the northwestward.

Bilby (North Dakota, Divide County; C. H. Sinclair, 1911).—About 6 miles south of International Boundary Monument 599; in SW¼ sec. 28, T. 163 N., R. 99 W., fifth principal meridian. The station is on a hill about one-half mile southeast of a gray house with a sun parlor on the east side. It is about 2 miles south of the road from Ambrose to Colgan.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a block of concrete.

Nat (North Dakota, Divide County; C. H. Sinclair, 1911).—About 1 mile south of a point on the International Boundary one-half mile west of Monument 602; in SW¼ sec. 31, T. 164 N., R. 98 W., fifth principal meridian; about 1 mile east of Ambrose post office. The station is east of the center of the road on the west boundary of the section, on a hill. It is approximately 2 meters west of the fence on the east side of the road. Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a concrete pier.

Ambrose West Base (North Dakota, Divide County; C. H. Sinclair, 1911).—About 3 miles south of International Boundary Monument 601; in SE¼ sec. 11, T. 163 N., R. 99 W., fifth principal meridian. The station is on the Minnesota, St. Paul and Sault Ste. Marie Railway, about 550 meters west of Ambrose railway station and 10.634 meters north of the center of the south rail.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a concrete pier.

Ambrose East Base (North Dakota, Divide County; C. H. Sinclair, 1911).—About 3 miles southwest of International Boundary Monument 602; in SW¼ sec. 7, T. 163 N., R. 98 W., fifth principal meridian, about 100 meters from the west boundary of the section. The station is on the Minnesota, St. Paul and Sault Ste. Marie Railway, about 1½ miles east of station "Ambrose West Base" and 78 meters east of the 590-mile post. It is 10.634 meters north of the center of the south rail.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a concrete pier.

Friess (Saskatchewan, Weyburn District; C. H. Sinclair, 1911).—About 1 mile north of International Boundary Monument 602; in SW¼ sec. 8, T. 1, R. 11 W., second meridian. The station is about 100 meters from the south boundary of the section and on the road allowance at the west boundary. It is on a small hill. Station mark: A cairn over a bronze disk marked "U. S. & C. B. SURVEY" set in a concrete pier.

Wheat (Saskatchewan, Weyburn District; C. H. Sinclair, 1911).—About three-fourths mile north of International Boundary Monument 603; in NW¼ sec. 4, T. 1, R. 11 W., second meridian; near a ranch house.

Station mark: Not recorded, but probably a bronze disk marked "U. S. & C. B. SURVEY" set in rock or concrete.

Gubert (North Dakota, Divide County; C. H. Sinclair, 1911).—About three-fourths mile south of International Boundary Monument 603; near the center of sec. 33, T. 164 N., R. 98 W., fifth principal meridian. The station is on a slight rise in the road reservation.

Station mark: A cairn over a bronze disk marked "U. S. & C. B. SURVEY" set in concrete.

Lister (Saskatchewan, Weyburn District; C. H. Sinclair, 1911).—About 1 mile northeast of International Boundary Monument 605; in NW¼ sec. 6, T. 1, R. 10 W., second meridian. The station is about 150 meters from the north boundary of the section, in a farmyard, about 20 meters southeast of a house.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in concrete nearly flush with the ground.

Huso (North Dakota, Divide County; C. H. Sinclair, 1911).—About 1½ miles south of the International Boundary midway between Monuments 605 and 606; in NW¼ sec. 6, T. 163 N., R. 97 W., fifth principal meridian. The station is on the east side of the road at the west boundary of the section and is approximately 300 meters from the north boundary. The slope of the road changes at the station.

Station mark: A cairn over a bronze disk marked "U. S. & C. B. SURVEY" set in concrete.

Hold (Saskatchewan, Weyburn District; C. H. Sinclair, 1911).—About 1 mile north of International Boundary Monument 607; in NE¼ sec. 4, T. 1, R. 10 W., second meridian. The station is on a rise about 250 meters west of a road and 100 meters from the north boundary of the section.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in concrete buried 20 inches in the ground, with small stones filling the hole.

Bloom (North Dakota, Divide County; C. H. Sinclair, 1911).—About 1 mile southeast of International Boundary Monument 607; in SE¼ sec. 33, T. 164 N., R. 97 W., fifth principal meridian. The station is on a small rise about one-third mile west of the road at the east boundary of the section.

Station mark: A cairn over a bronze disk marked "U. S. & C. B. SURVEY" set in concrete.

Church (North Dakota, Divide County; C. H. Sinclair, 1911).—About 1 mile south of the International Boundary midway between Monuments 608 and 609; in SW¼ sec. 35, T. 164 N., R. 97 W., fifth principal meridian. The station is about 260 meters from the road at the south boundary of the section. It is on a slight rise in a field, about 240 meters north and slightly west of some buildings.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in concrete buried 20 inches in the ground, with small rocks placed over it before filling the hole with earth.

Good (Saskatchewan, Weyburn District; C. H. Sinclair, 1911).—About one-half mile northwest of International Boundary Monument 610; in SE¼ sec. 1, T. 1, R. 10 W., second meridian. The station is on a small

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a concrete block buried 20 inches in the ground, with a few rocks placed in the hole before filling with earth.

Mouse (North Dakota, Divide County; C. H. Sinclair, 1911).—About 1¼ miles south of International Boundary Monument 610; in SE¼ sec. 31, T. 164 N., R. 96 W., fifth principal meridian. It is about 50 meters from the road at the south boundary of the section and approximately 250 meters from the west boundary. The station is on a slight rise.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a concrete block buried 20 inches in the ground, with rocks placed in the hole before filling with earth.

Bacon (North Dakota, Divide County; C. H. Sinclair, 1911).—About 1 mile south of International Boundary Monument 612; in SE¼ sec. 34, T. 164 N., R. 96 W., fifth principal meridian, about 3 meters from the north-and-south, and 200 meters from the east-and-west midsection lines. The station is on the west side of a flat-topped mound.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a concrete block buried 20 inches in the ground, with a few rocks placed in the hole before filling with earth.

Hansen (Saskatchewan, Assiniboia District; C. H. Sinclair, 1911).—About one-half mile north of the International Boundary, midway between Monuments 612 and 613; in NW¼ sec. 2, T. 1, R. 9 W., second meridian. The station is on a flat-topped knoll about 100 meters north of the east-and-west road and 400 meters west of the house near the center of the section.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a concrete block buried about 20 -nches in the ground, with a few rocks placed in the hole before filling with earth.

Feeney (North Dakota, Divide County; C. H. Sinclair, 1911).—About 1 mile south of the crossing of the International Boundary by Long Creek, about midway between Monuments 613 and 614; in SW¼ sec. 31, T. 164 N., R. 95 W., fifth principal meridian. The station is on the east bank of Long Creek where the creek flows from the west and turns sharply back to the northwest. It is about 70 meters southeast of the turn on the west side of the road.

Station mark: A cairn over a bronze disk marked "U. S. & C. B. SURVEY" set in a concrete pier.

Burner (Saskatchewan, Assiniboia District; C. H. Sinclair, 1911).—About three-fourths mile northwest of International Boundary Monument 614; in NE¼ sec. 6, T. 1, R. 8 W., second meridian, approximately 75 meters from the east boundary of the section and 300 meters from the east-and-west midsection line. The station is on a slight elevation about 300 meters east of Long Creek.

Station mark: A flat rock over a bottle buried 2 feet in the ground.

Just (Saskatchewan, Assiniboia District; C. H. Sinclair, 1911).—About 300 meters north of the road along the International Boundary, one-fourth mile east of Monument 615; in SW½ sec. 3, T. 1, R. 8 W., second meridian, approximately 200 meters from the west boundary of the section. The station is on a slight elevation.

Station mark: A bottle buried 2 feet in the ground.

Plow (North Dakota, Divide County; C. H. Sinclair, 1911).—About 1½ miles southwest of International Boundary Monument 616; in NE¼ sec. 3, T. 163 N., R. 95 W., fifth principal meridian. The station is in the highest part of a field, approximately one-fourth mile from the road on the north boundary of the section, and one-half mile from the road on the west boundary.

Station mark: A flat rock over a bottle buried 2 feet in the ground.

Ross (Saskatchewan, Assiniboia District; C. H. Sinclair, 1911; 1912).—About 100 meters north of the International Boundary midway between Monuments 617 and 618; in SE½ sec. 6, T. 1, R. 7 W., second meridian. The station is on the south edge of a flat ridge.

Station mark: A flat rock over a bottle neck buried 2 feet underground.

Corn (North Dakota, Burke County; C. H. Sinclair, 1911; 1912).—About 2 miles southwest of International Boundary Monument 618; in SE½ sec. 6, T. 163 N., R. 94 W., fifth principal meridian. On the highest knoll in the vicinity. The station is on the southwest part of the top of the knoll.

Station mark: A flat rock over a bottle buried 2 feet underground.

Ross West Base (North Dakota, Divide County; O. B. French, 1912).—About 1¼ miles south of International Boundary Monument 617; in NE¼ sec. 1, T. 163 N., R. 95 W., fifth principal meridian. The station is on the south side of the road at the north boundary of the township and about 330 meters from the road on the east boundary. It is about 6 meters from the plowed field at the west end of the high part of the land.

Station mark: A cross on a boulder set flush with the ground, with another boulder also marked by a cross set 2 feet under the upper one.

Ross East Base (North Dakota, Burke County; O. B. French, 1912).—About 1½ miles southwest of International Boundary Monument 618; in NE½ sec. 6, T. 163 N., R. 94 W., fifth principal meridian. The station is on the south side of the road on the north boundary of the section and is about 100 meters from the road on the east boundary.

Station mark: A cross on a boulder set flush with the ground, with another boulder also marked by a cross set 16 inches below the upper one.

Crosby 2 (North Dakota, Burke County; J. J. McArthur, 1910; 1911). About 2½ miles southwest of International Boundary Monument 620; in SW½ sec. 3, T. 163 N., R. 94 W., fifth principal meridian. The station is about 22 meters north of the center of the road on the south boundary of the section, on the north edge of a large stone pile.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a rock 2 feet underground.

Percee (Saskatchewan, Assiniboia District; J. J. McArthur, 1910).—About 1¼ miles northeast of International Boundary Monument 624; in SW¼ sec. 10, T. 1, R. 6 W., second meridian. The station is 200 meters north of the road on the south boundary of the section and 160 meters from the north-and-south midsection line.

Station mark: A bronze disk set in a boulder.

Columbus (North Dakota, Burke County; J. J. McArthur, 1910).—About 1¾ miles south of the International Boundary midway between Monuments 624 and 625; in SW¼ sec. 3, T. 163 N., R. 93 W., fifth principal meridian, approximately 43 meters south of the east-and-west, and 200 meters from the north-and-south midsection lines.

Station mark: A bronze disk set in a boulder.

Center II (North Dakota, Burke County; J. J. McArthur, 1910; 1918).—In fractional sec. 26, T. 164 N., R. 93 W., fifth principal meridian; about 100 meters south of International Boundary Monument 625. The station is about 10 meters south of a building.

Station mark: A bronze disk set in a rock.

Rival (North Dakota, Burke County; J. J. McArthur, 1910).—About 1¾ miles south of the International Boundary midway between Monuments 627 and 628; in NW¼ sec. 5, T. 163 N., R. 92 W., fifth principal meridian. The station is on the north side of the east-and-west midsection road and about 640 meters from the west boundary of the section.

Station mark: A bronze disk set in a boulder.

South Portal (North Dakota, Burke County; J. J. McArthur, 1910).—About 2½ miles southeast of International Boundary Monument 632; in SW½ sec. 3, T. 163 N., R. 91 W., fifth principal meridian, about 200 meters north and 342 meters east of the southwest corner of the section. The station is on a prominent knoll.

Station mark: A drill hole in a boulder.

Portal North Base (North Dakota, Burke County; O. B. French, 1912; 1919).—About 1 mile southeast of International Boundary Monument 630 at Portal, North Dakota; in SE¼ sec. 31, T. 164 N., R. 91 W., fifth principal meridian. The station is on the east side of the Soo Line Railway track, 15 meters from the west rail, on a slight rise of the ground, but below the level of the railroad track. It is one-half mile from the intersection of the railway track with the road on the east boundary of the section.

Station mark: A cross on a stone about 10 inches in diameter and 6 inches thick set just below the surface of the ground. Another stone weighing about 150 pounds with a cross on it is set directly under the upper one, with its top 18 inches below the surface of the ground.

Portal South Base (North Dakota, Burke County; O. B. French, 1912; 1919).—About 3 miles southeast of International Boundary Monument 630; in SW¼ sec. 4, T. 163 N., R. 91 W., fifth principal meridian. The station is on the east side of the Soo Line Railway track, 15.385 meters from the west rail, on the first bench north of the prominent ridge which is just north of the crossing of the railroad by the road, 2¼ miles south of the boundary. It is about 200 meters north of the road and near the east boundary of the section.

Station mark: A cross on a hard, blue stone weighing about 100 pounds set just below the surface of the ground. Another stone, about 1 foot in diameter with a cross on it, is set directly under the upper one, with its top 21 inches below the surface of the ground.

Spy (Saskatchewan, Assiniboia District; J. J. McArthur, 1910).—About 1¼ miles northwest of International Boundary Monument 638; in SW¼ sec. 12, T. 1, R. 3 W., second meridian. It is about two-thirds mile west of the Canadian National Railway track at a point 1 mile north of Northgate, Saskatchewan. The station is on the highest part of the hill.

Station mark: A bronze disk set in a boulder.

Morse (North Dakota, Renville County; J. J. McArthur, 1910; 1918).—About 2½ miles south of International Boundary Monument 653. The station is on a rise in the field 145 meters east of the road on the west boundary of sec. 4, T. 163 N., R. 86 W., fifth principal meridian, and is about 200 meters north of the south boundary of the section.

Station mark: A cross on a boulder set flush with the ground. Another boulder with a cross on it is buried 2 feet below the surface of the ground, directly under the upper one.

Center VIII (Saskatchewan, Assiniboia District; J. J. McArthur, 1910; 1919).—About 165 meters northwest of International Boundary Monument 655; in the southwest corner of SW¼ sec. 1, T. 1, R. 33 W., principal meridian. The station is on the highest ground in the vicinity.

Station mark: Originally a wooden hub driven flush with the ground. The station was re-marked in 1919. The subsurface mark is now a cross cut with a chisel on a granite boulder 10 by 10 by 6 inches placed with its top surface 18 inches below the surface of the ground. The surface mark is a bronze disk set in the top of a stone 8 by 10 by 20 inches set on end on top of the lower stone.

Morse West Base (North Dakota, Renville County; O. B. French, 1912; 1918).—About 2½ miles south of the International Boundary midway between Monuments 653 and 654. The station is on the south side of the road at the south boundary of sec. 3, T. 163 N., R. 86 W., fifth principal meridian. It is about 18½ meters south of the fence on the north side of the road, and 125 meters from the fence on the east side of the road at the west boundary of the section.

Station mark: A cross on a boulder projecting slightly above the surface of the ground. Another boulder with a cross on it is buried 18 inches below the surface of the ground, directly under the upper one.

Morse East Base (North Dakota, Renville County; O. B. French, 1912; 1918).—About 2½ miles south of International Boundary Monument 655. The station is on the south side of the road at the south boundary of sec. 2, T. 163 N., R. 86 W., fifth principal meridian. It is about 6 meters south of the center of the road on the most prominent little elevation in the vicinity.

Station mark: A cross on a boulder set flush with the ground. Another boulder with a cross on it is buried 2 feet below the surface of the ground, directly under the upper one.

Center X (North Dakota, Bottineau County; J. J. McArthur, 1910).—About 300 meters south of the International Boundary at a point one-half mile west of Monument 674; in the west half of fractional sec. 25, T. 164 N., R. 82 W., fifth principal meridian. The station is on a knoll.

Station mark: A wooden hub driven flush with the ground. The subsurface mark is an iron bolt, 1 foot below the surface, directly under the hub.

Center XI (Manitoba, Souris District; J. J. McArthur, 1910; 1919).—About 9 meters north of the International Boundary at a point 380 meters west of Monument 676; in SW¼ sec. 4, T. 1, R. 28 W., principal meridian.

Station mark: The original mark was a wooden hub driven flush with the ground. In 1919 the station was recovered and re-marked. The subsurface mark is now a cross cut on a limestone boulder 14 by 18 by 6 inches set with its face 18 inches below the surface of the ground. The surface mark is a bronze disk set in the top of a marble boulder 12 by 14 by 20 inches set on end with its top just above the surface of the ground.

Knoll (Manitoba, Souris District; J. J. McArthur, 1910; 1919).—About 1¾ miles north of International Boundary Monument 692; on a prominent high conical hill in NE¼ sec. 8, T. 1, R. 24 W., principal meridian; about 150 meters northwest of a house.

Station mark: The original mark was a wooden hub driven flush with the ground. In 1919 the station was re-marked. The surface mark is now a bronze disk set in a granite boulder 14 by 18 by 20 inches set with its top about flush with the ground. The subsurface mark is a cross cut in a limestone boulder about 20 by 20 by 12 inches, the top of which is about 20 inches below the surface of the ground. One reference mark is a cross cut in a granite boulder nearly 3 feet in diameter, 14.3 meters northeast of the station. A second reference mark is a cross cut in a large granite boulder about 4 feet in diameter 22.7 meters nearly west of the station.

Bottineau (Manitoba, Souris District; J. J. McArthur, 1910; 1919).—On the first high ridge of the Turtle Mountains, approaching from the west; in SE¼ sec. 5, T. 1, R. 23 W., principal meridian. The station is 2.09 meters northwest of International Boundary Monument 697.

Station mark: A bronze disk set in a flat stone flush with the ground.

Steele 2 (North Dakota, Bottineau County; O. B. French, 1912).—About 1¾ miles south of International Boundary Monument 692; on the highest point on the highest of several hills; in NE¼ sec. 4, T. 163 N., R. 77 W., fifth principal meridian.

Station mark: The surface mark is a cross, the lines of which are about 5 inches long, cut in a boulder. The subsurface mark, 15 inches lower, is a similar cross cut in a boulder. This station is likely to have rocks piled over it.

Rock (North Dakota, Bottineau County; O. B. French, 1912).—About 1½ miles southeast of International Boundary Monument 692; in NE¼ sec. 3, T. 163 N., R. 77 W., fifth principal meridian; on the top of the highest knoll in the vicinity. The greater part of the top of the knoll is covered by a large pile of boulders. The station is on the northwest side of this rock pile, about 2 meters distant from it.

Station mark: The surface mark is a cross, with 5-inch lines, cut in a large boulder set flush with the surface of the ground. The subsurface mark, 15 inches below the top mark, is a similarly marked boulder.

Souris West Base (North Dakota, Bottineau County; O. B. French, 1912; 1918).—About 600 meters southeast of International Boundary Monument 691; on the road north of sec. 32, T. 164 N., R. 77 W., fifth principal meridian, 2.93 meters south of the center of the road, beside a farmyard. The station is on range with a pump under a windmill and the extreme southwest edge of a large pile of boulders in a pasture. It is also on range with the northeast corner of the nearest shed from which it is 78.0 meters distant and the northwest corner of a smaller shed.

Station mark: The surface mark is a cross on the flat side of a boulder about 2.5 by 1.5 by 0.7 feet set an inch or two lower than the level of the yard. The subsurface mark is a cross on the flat side of a small boulder about 2 feet below the surface. The reference mark is the northwest corner of a barn, 36.4 meters from the station in azimuth 306°.

Souris East Base (North Dakota, Bottineau County; O. B. French, 1912; 1918).—About 600 meters southwest of International Boundary Monument 692; on the road north of sec. 33, T. 164 N., R. 77 W., fifth principal meridian, on the first steep rise as seen from the west. The road runs through the crest of the hill in a cut about 4 feet deep and the station is on the south side of the cut, 5.60 meters from the center of the road.

Station mark: The surface mark is a cross cut in a red granite boulder, 6 by 6 by 18 inches, set on end with the larger end down and projecting about 4 inches above the surface of the ground. The subsurface mark is a cross cut in the center of a flat slab of limestone, 9 by 9 inches, 2.4 feet below the surface of the ground. The reference marks are two piles of small boulders 44.40 and 31.10 meters from the station, in azimuths 26° and 304°, respectively. Another reference mark is an arrow cut in a large, flat boulder planted level with the ground, 2.44 meters from the station in azimuth 100°.

Center XVII (Manitoba, Souris District; J. J. McArthur, 1910; 1919).—In the northwest corner of sec. 1, T. 1, R. 23 W., on a heavily timbered ridge nearly 1 mile north and about one-fourth mile west of International Boundary Monument 699. There is a small lake nearly one-half mile south and a little east of the station.

Station mark: The original mark was a wooden hub driven flush with the ground. In 1919 the station was re-marked. The mark is the top of a ¾- by 14-inch steel drill, the top of which is 3 inches below the surface of the ground and over which is a bronze disk, surmounted by a few small stones. A mound of earth 4 feet in diameter and 2 feet high with a trench around it, was erected over the mark.

Bois (Manitoba, Souris District; J. J. McArthur, 1910; 1919).—About 1¾ miles northeast of International Boundary Monument 699; near the center of sec. 7, T. 1, R. 22 W., principal meridian; on a high brushy knob. There is a swamp just southeast of the station, another swamp northwest of the station, and a small lake one-fourth mile southwest of the station.

Station mark: The surface mark is a bronze disk set in a granite boulder 10 by 10 by 18 inches, the top of which is 4 inches above the surface of the ground. The subsurface mark is a cross cut in a basaltic boulder 8 by 12 by 16 inches, set with its top face 15 inches below the surface.

Fish (Manitoba, Souris District; J. J. McArthur, 1910; 1919).—About three-fourths mile northeast of International Boundary Monument 703; in NW¼ sec. 2, T. 1, R. 22 W., principal meridian; on the northwest corner of a large flat-topped bench or tableland of several acres in extent, covered with high brush and trees. This high land is between Ross (Eramosh) and Margaret Lakes.

Station mark: Originally marked by a wooden hub driven flush with the ground. In 1919 the station was re-marked. The surface mark is a bronze disk set in a granite boulder 12 by 12 by 16 inches, its surface about 4 inches above the surface of the ground. The subsurface mark is a cross in the top of a granite boulder 10 by 10 by 10 inches, 1 foot below the surface.

Field (North Dakota, Bottineau County; J. J. McArthur, 1910).—About 2 miles south and a little west of International Boundary Monument 704; in SW¼ sec. 6, T. 163 N., R. 74 W., fifth principal meridian, about 120 meters east of the west side of the section.

Station mark: A drill hole in rock.

Ack (North Dakota, Bottineau County; J. J. McArthur, 1910; 1919).—About 2½ miles south and a little east of International Boundary Monument 706; on a high, round-topped, brushy knoll; about 90 meters south and 335 meters west of the northeast corner of sec. 10, T. 163 N., R. 74 W., fifth principal meridian, and about 90 meters northwest of the Scandinavian church which is very conspicuous from every direction.

Station mark: The original mark was a wooden hub driven flush with the ground. In 1919 the station was re-marked. The surface mark is a bronze disk set in a granite boulder approximately 12 by 12 by 20 inches, set on end. The subsurface mark is a cross in a granite boulder 12 inches in diameter set 20 inches underground.

Fair (Manitoba, Souris District; J. J. McArthur, 1910; 1919).—About 2 miles north of the International Boundary, midway between Monuments 706 and 707; on the summit of the most prominent hill in the vicinity; about 150 meters south and about 60 meters east of the northwest corner of sec. 10, T. 1, R. 21 W., principal meridian. There is a small lake about 300 meters east of the station and a hay meadow about 150 meters west of it.

Station mark: The original mark was a wooden hub driven flush with the ground. In 1919 the station was re-marked. The surface mark is a bronze disk set in a granite boulder about 10 by 10 by 16 inches, which projects about 4 inches above the surface of the ground, and around which some smaller stones have been placed. The subsurface mark is a cross cut in the top of a black basalt boulder about 8 by 10 by 12 inches set 1 foot underground.

Worth (North Dakota, Bottineau County; J. J. McArthur, 1910; 1919).—Nearly 1 mile southwest of International Boundary Monument 712; on the north end of a prominent spur in NE¼ sec. 31, T. 164 N., R. 72 W., fifth principal meridian. There is a large oak tree, visible from a considerable distance, on the east edge of the spur, 7.5 meters from the station.

Station mark: The original mark was a wooden hub driven flush with the ground. In 1919 the station was re-marked. The surface mark is a bronze disk set in a granite boulder 10 by 12 by 20 inches, set on end with its top and the disk flush with the ground. The subsurface mark is a cross cut in a granite boulder 8 by 16 by 20 inches, set 20 inches underground.

Ninga (Manitoba, Souris District; J. J. McArthur, 1911).—Station lost; see description of station "Ninga H."

Center XIX (Manitoba, Souris District; J. J. McArthur, 1911; 1919).—About one-half mile northeast of International Boundary Monument 714 and near the center of sec. 4, T. 1, R. 19 W., principal meridian; on the eastern and highest point of an isolated hill, the highest in the vicinity.

Station mark: Originally marked by a wooden hub driven flush with the ground. In 1919 the station was re-marked. The surface mark is a bronze disk set in a granite boulder 10 by 12 by 18 inches, set on end with

the top just below the surface of the ground. The subsurface mark is a cross cut in the top of a granite boulder 6 by 8 by 10 inches, set 24 inches underground.

Center XX (Manitoba, Souris District; J. J. McArthur, 1911; 1919).—About one-third mile northwest of International Boundary Monument 718; near the north-and-south center line of sec. 5, T. 1, R. 18 W., principal meridian; on the north end of a prominent isolated hill.

Station mark: Originally marked by a wooden hub driven flush with the ground. In 1919 the station was re-marked. The surface mark is a bronze disk set in a granite boulder 8 by 10 by 20 inches, set on end with its top flush with the surface of the ground. The subsurface mark is a cross cut in a basaltic boulder 6 by 16 by 18 inches, set 20 inches underground.

St. Johns (North Dakota, Rolette County; J. J. McArthur, 1911; 1919).—About three-fourths mile south and a little east of International Boundary Monument 719; in NE¼ sec. 35, T. 164 N., R. 71 W., fifth principal meridian; on the highest point of a flat-topped brushy hill on the last high eastern spur of the Turtle Mountains.

Station mark: The original mark was a wooden hub driven flush with the ground. In 1919 the station was re-marked. The surface mark is a bronze disk set in a granite boulder 8 by 12 by 16 inches, set on end with its top flush with the surface of the ground. The subsurface mark is a cross in a granite boulder 6 by 10 by 10 inches, set 24 inches underground.

Bannerman North Base (Manitoba, Souris District; J. J. McArthur, 1911; 1919).—On the southwest side of the Great Northern Railway about one-fourth mile southeast of the town of Bannerman; on the top of the first high ground south of a railway fill across some low ground. The station is 1 meter outside the railway fence, between the last two telegraph poles on the southwest side of the track, and is 15.47 meters southwest of the center of the southwest rail of the track.

Station mark: The original station was recovered in 1912 and re-marked. The surface mark is a cross cut in a reddish granite boulder about 12 by 14 by 24 inches, set flush with the surface of the ground. The subsurface mark is a cross cut in a similar boulder, the top of which is 14 by 18 inches, set 30 inches underground.

East (Manitoba, Souris District; J. J. McArthur, 1911).—About 2¾ miles north of International Boundary Monument 720; on the highest point of a ridge running north and south in NE¼ sec. 14, T. 1, R. 18 W., principal meridian; about 1¼ miles east and a little south of Bannerman railway station.

Station mark: A drill hole in a boulder.

Bannerman South Base (Manitoba, Souris District; J. J. McArthur, 1911; 1919).—On the southwest side of the Great Northern Railway, on the highest ridge that crosses the railway between Bannerman and the International Boundary, and about 1 mile along the railway from the boundary; near the center of sec. 1, T. 1, R. 18 W., principal meridian. The station is 15.40 meters southwest of the southwest rail of the track. At this point the track lies in a cut and the station is about 15 feet above it. The station is 1.2 meters southwest of the railway fence.

Station mark: The original station was recovered in 1912 and was re-marked. The surface mark is a cross with 4-inch lines cut in a large reddish granite boulder. The subsurface mark is a cross in a similar boulder buried 22 inches below the surface mark.

Center XXI (Manitoba, Souris District; J. J. McArthur, 1911; 1919).—About one-half mile north of the International Boundary, midway between Monuments 722 and 723; on the south edge of a flat-topped rise of land just west of McGillis Creek near the center of sec. 5, T. 1, R. 17 W., principal meridian.

Station mark: The original mark was a wooden hub driven flush with the ground. In 1919 the station was re-marked. The surface mark is a bronze disk set in a circular concrete block 10 inches in diameter and 20 inches long, set with its top slightly below the surface of the ground. The subsurface mark is a cross cut in a granite boulder 8 by 10 by 12 inches, set with its top 26 inches underground.

Rolla (North Dakota, Rolette County; J. J. McArthur, 1911).—A little more than 1 mile south of the International Boundary, midway between Monuments 723 and 724; in SW¼ sec. 36, T. 164 N., R. 70 W., fifth principal meridian; on the west end of the highest noticeable short ridge.

Station mark: A drill hole in rock.

Lena (Manitoba, Souris District; J. J. McArthur, 1911; 1919).—About 2½ miles north of the International Boundary, midway between Monuments 723 and 724; on the highest point of a noticeable hill in SW¼ sec. 15, T. 1, R. 17 W., principal meridian.

Station mark: The original mark was a wooden hub driven flush with the ground. In 1919 the station was re-marked. The surface mark is a bronze disk set in the top of a circular concrete block 10 inches in diameter and 18 inches long, set with the top 4 inches below the surface of the ground. The subsurface mark is a cross cut in a stone 6 by 10 by 10 inches set with its top face 24 inches underground.

Enter (Manitoba, Souris District; J. J. McArthur, 1911; 1919).—About 2 miles north of International Boundary Monument 726; on top of a prominent knoll on the east-and-west section-line road, about 90 meters east of the southwest corner of sec. 17, T. 1, R. 16 W., principal meridian. The station is about 180 meters southeast of a yellow farmhouse.

Station mark: Originally marked by a wooden hub driven flush with the ground. The station was re-marked in 1919. The surface mark is a bronze disk set in a concrete post 8 inches in diameter and 24 inches long, set with its top flush with the ground. The subsurface mark is an iron bolt set in a concrete block 6 inches in diameter and 12 inches long set with its top 24 inches underground.

Prise (North Dakota, Rolette County; J. J. McArthur, 1911; 1919).—About 1½ miles south of the International Boundary, midway between Monuments 726 and 727; on the first prominent rise of ground about 300 meters west of the southeast corner of sec. 34, T. 164 N., R. 69 W., fifth principal meridian; on the south side of the road south of that section. There is a schoolhouse at the section corner, and a red barn about 240 meters nearly due north of the station.

Station mark: Originally marked by a wooden hub driven flush with the ground. The station was remarked in 1919. The surface mark is a bronze disk set in the top of a concrete post 7 inches in diameter and 22 inches long, with its top 5 inches below the surface of the ground. The subsurface mark is an iron bolt set in the top of a concrete post 6 inches in diameter and 14 inches long, set with its top 27 inches underground. One reference mark is a telephone pole 11.7 meters southwest of the station and a second reference mark is a large boulder 16.2 meters northeast of the station.

Center XXIII (Manitoba, Souris District; J. J. McArthur, 1911; 1919).—On the road allowance south of sec. 3, T. 1, R. 16 W., principal meridian, 2.90 meters northwest of International Boundary Monument 728.

Station mark: Originally marked by a wooden hub. The station was re-marked in 1919. The surface mark is a bronze disk set in a granite boulder 10 by 10 by 10 inches, set with its top about 4 inches below the surface of the ground. The subsurface mark is a cross cut in the top of a triangular stone 6 inches thick with sides 14 inches long, placed 20 inches underground.

Field (North Dakota, Towner County; J. J. McArthur, 1911; 1919).—About 1½ miles southeast of International Boundary Monument 730; on the northern part of a flat-topped rise of some prominence in the SW¼ sec. 33, T. 164 N., R. 68 W., fifth principal meridian. A slight mound or knoll distinguishes the point where the station is from other portions of the rise of land.

Station mark: Originally marked by a wooden hub. The station was re-marked in 1919. The surface mark is a bronze disk set flush with the ground in a stone 6 by 10 by 16 inches. The subsurface mark is a cross cut in a stone 6 by 10 by 10 inches, set 20 inches underground.

Hans (North Dakota, Towner County; J. J. McArthur, 1911; 1919).—About 1½ miles south of the International Boundary, nearly midway between Monuments 734 and 735; on the highest part of a sharp gravel knoll in NW¼ sec. 4, T. 163 N., R. 67 W., fifth principal meridian. There is a cut about 10 feet deep through the knoll just east of the station. A large red barn and farmhouse are about 210 meters north of east from the station and there is another large red barn north of west from the station.

Station mark: Originally marked by a wooden hub. The station was re-marked in 1919. The surface mark is a bronze disk set in a stone 10 by 14 by 18 inches, the top of which is flush with the surface of the ground. The subsurface mark is a cross cut in a stone 8 by 12 by 16 inches, set 24 inches underground.

Ridge (North Dakota, Towner County; J. J. McArthur, 1911; 1919).—About 1½ miles south of International Boundary Monument 742; on a gravel ridge about 60 meters north and about 240 meters west of the southeast corner of sec. 34, T. 164 N., R. 66 W., fifth principal meridian. There is a gravel pit just east of the station.

Station mark: Originally marked by a wooden hub. The station was re-marked in 1919. The surface mark is a bronze disk set in a granite boulder 14 by 16 by 20 inches, flush with the ground. The subsurface mark is a cross cut in a granite boulder 8 by 14 by 14 inches, set 20 inches underground. One reference mark is a cross on a stone 8 by 8 by 19 inches set flush with the ground in a fence line 36.1 meters north of a fence corner. This reference mark is 42.7 meters southeast of the station. A second reference mark is a cross on a stone set in a fence line flush with the ground 34.0 meters from the same fence corner. This reference mark is 51.7 meters south of the station. The angle between the stones at the station is 60°19′; the distance between the stones is 48.06 meters. The angle at the southeast stone from the south stone to the station is 69°13′; the angle at the south stone from the station to the southeast stone is 50°28′.

City (Manitoba, Lisgar District; J. J. McArthur, 1911).—About 2% miles north of International Boundary Monument 756; on a noticeable hill at the northeast corner of SE¼ sec. 17, T. 1, R. 11 W., principal meridian. Station mark: A drill hole in a boulder.

Hannah (Manitoba, Lisgar District; North Dakota, Cavalier County; J. J. McArthur, 1911; 1912).—On top of an old earth mound on a rise of land on the International Boundary about 335 meters west of Monument 764.

Station mark: Originally marked by a wooden hub. The station was re-marked in 1912. The surface mark is a cross cut in a boulder the top of which is flush with the surface of the ground. The subsurface mark is a cross cut in a boulder the top of which is 16 inches underground.

Hannah North Base (Manitoba, Lisgar District; O. B. French, 1912; 1919).—About 2½ miles almost due north of International Boundary Monument 765; on a slight rise in the ground on the road allowance between secs. 13 and 14, T. 1, R. 10 W., principal meridian.

Station mark: A bronze disk set in a large boulder the top of which is flush with the surface of the ground. The subsurface mark is a cross with 4-inch lines cut in a boulder the top of which is one-half meter below the surface of the ground. Two reference marks are large boulders, distant 38 and 39 meters respectively from the station, a very little east of due south. Another reference mark is the fence corner at the southwest corner of NE½ sec. 13, T. 1, R. 10 W., principal meridian, 51.80 meters from the station in azimuth 175°. The bronze disk for the surface mark was set in 1919.

Hannah South Base (Manitoba, Lisgar District; O. B. French, 1912; 1919).—About two-thirds mile nearly due north of International Boundary Monument 765; on the first prominent little ridge which crosses the road allowance between secs. 1 and 2, T. 1, R. 10 W., principal meridian. The station is about 2 meters east of the fence on the west side of the road allowance. About 100 meters north of the station is an area of low ground very wet in wet weather.

Station mark: A bronze disk set in a reddish boulder, 1 foot in diameter at the top and 2 feet in depth, the top of which is flush with the surface of the ground. The subsurface mark is a cross with 4-inch lines cut in a large boulder the top of which is $2\frac{1}{4}$ feet underground. The bronze disk was set in 1919.

Haskett North Base (Mark) (Manitoba, Lisgar District; O. B. French, 1912; 1919).—About 3 miles almost due north of International Boundary Monument 797, and near the northeast corner of NW¼ sec. 18, T. 1, R. 4 W., principal meridian; 11.40 meters northeast of the center of the east rail of the Great Northern Railway, 141 meters south along the railroad from the south side of the road allowance to the north.

Station mark: A cross cut in a stone, about 6 inches thick and 10 inches in diameter, the top of which is slightly below the surface of the ground. The subsurface mark is a similarly marked stone 0.44 meter below the upper stone.

Haskett South Base (Mark) (Manitoba, Lisgar District; O. B. French, 1912; 1919).—About 700 meters northeast of International Boundary Monument 798; in SE½ sec. 5, T. 1, R. 4 W., principal meridian; 11.40 meters from the center of the east rail of the Great Northern Railway; about 200 meters north of the north end of the trestle over the one small water hole north of the International Boundary.

Station mark: A cross in the top of a granite boulder 10 inches in diameter, the top of which is a little below the surface of the ground. The subsurface mark is a similarly marked granite boulder, the top of which is one-half meter underground.

Cross (North Dakota, Pembina County; J. J. McArthur, 1911).—About one-half mile southeast of International Boundary Monument 810; on a noticeable rise in sec. 25, T. 164 N., R. 55 W., fifth principal meridian, about 90 meters east of the west boundary of the section and about 640 meters south of the International Boundary.

Station mark: A drill hole in a boulder.

Neche (Manitoba, Lisgar District; O. B. French, 1912; 1919).—About one-half mile southwest of the town of Gretna; in the southwest corner of sec. 5, T. 1, R. 1 W., principal meridian; 20.5 meters northeast of International Boundary Monument 816.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set flush with the surface of the ground in the top of a cylinder of concrete 1 foot in diameter and 2 feet in depth. The subsurface mark is a $3\frac{1}{2}$ -inch wire nail set upright in a core of cement 2 inches below the bottom of the concrete cylinder.

Neche West Base (Manitoba, Lisgar District; O. B. French, 1912; 1919).—About 4 meters north of the International Boundary, and about 350 meters west of Monument 817; in the road allowance south of SE¼ sec. 5, T. 1, R. 1 W., principal meridian.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in the top of a cylindrical concrete pier 11 inches in diameter, but flaring to 13 inches in diameter, and 2 feet long, its top flush with the surface of the ground. The subsurface mark is a 3½-inch wire nail standing perpendicularly in a core of cement, the head of the nail being about 2 inches below the concrete pier.

Neche East Base (Manitoba, Lisgar District; O. B. French, 1912; 1919).—Just north of the International Boundary about 520 meters east of Monument 818; in the road allowance south of SW¼ sec. 3, T. 1, R. 1 W., principal meridian.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in the top of a block of concrete about 18 inches deep, 20 inches in diameter at the base and 12 inches at the top which is flush with the ground. The subsurface mark is the head of a twentypenny nail set in a bed of concrete at a depth of about 20 inches underground.

Nash (North Dakota, Pembina County; J. J. McArthur, 1911; 1919).—About 1½ miles south of International Boundary Monument 830; on the north limit of the road along the south side of sec. 32, T. 164 N., R. 51 W., fifth principal meridian; about 610 meters west of the Northern Pacific Railway. The station is between the twelfth and thirteenth electric light poles on the south side of the roadway, the former being 26.2 meters to the southeast and the latter 33.3 meters to the southwest. The nearest telephone pole on the north side of the road is 11.2 meters to the east and 0.6 meter to the north.

Station mark: A bronze disk set in the top of a concrete post 12 inches square and 3 feet long, the top of the post just below the surface of the ground and covered with soil.

Wet (Manitoba, Provencher District; J. J. McArthur, 1911; 1928).—About 2 miles north of International Boundary Monument 831, and about 46 meters west of the Canadian National Railway; on the south side of the road along the north side of sec. 10, T. 1, R. 1 E., principal meridian.

Station mark: A bronze disk set in the top of a concrete block.

Barnet (Minnesota, Kittson County; C. H. Sinclair, 1912; 1928).—About 1% miles south of International Boundary Monument 834; 364 meters east of the road on the west side, and 10.5 meters north of the center of the road on the south side of sec. 31, T. 164 N., R. 50 W., fifth principal meridian.

Station mark: A bench-mark post set in cement, the top 0.4 meter above ground.

Elkins (Manitoba, Provencher District; C. H. Sinclair, 1912).—About 2 miles almost due north of International Boundary Monument 835; on the south side of the road, about 400 meters west of the northeast corner of sec. 7, T. 1, R. 3 E., principal meridian; about 1 meter south of the line of telephone poles.

Station mark: A bronze disk set in cement.

Finney (Minnesota, Kittson County; C. H. Sinclair, 1912).—About 1½ miles almost due south of International Boundary Monument 839; 17.6 meters west of the center of the road on the east side of sec. 35, T. 164 N., R. 50 W., fifth principal meridian; and 113 meters north of the center of the road along the south side of that section.

Station mark: A bench-mark post set in a mass of concrete 3 feet in the ground.

Shultz (Manitoba, Provencher District; C. H. Sinclair, 1912; 1928).—About 2 miles almost due north of International Boundary Monument 839; about 490 meters west of the southeast corner of sec. 14, T. 1, R. 3 E., principal meridian; and on the north side of the road.

Station mark: A bench-mark post set in a mass of concrete.

Humboldt (Minnesota, Kittson County; C. H. Sinclair, 1912).—About one-half mile east of the town of Humboldt, on the south side of a road 5.6 miles south of the International Boundary. The station is in a small swale, about 3.7 meters west of a small drainage ditch, 90 meters from the center of an east-and-west road and 342 meters east of the center of a north-and-south road.

Station mark: A bronze disk set in a mass of concrete 18 by 8 by 8 inches.

Joe (Minnesota, Kittson County; C. H. Sinclair, 1912; 1928).—About 1¾ miles south of International Boundary Monument 844; in sec. 2, T. 163 N., R. 49 W., fifth principal meridian; about 200 meters north of a small coulee, and in line with the prolongation of the road between secs. 2 and 3, T. 1, R. 4 E., principal meridian, on the Canadian side. A 30-foot tower was erected at this station to see north and east.

Station mark: A bench-mark post set 3 feet deep in concrete, 1 foot being above ground.

Schrader (Manitoba, Provencher District; C. H. Sinclair, 1912; 1928).—About 2 miles north of International Boundary Monument 844, and very near the southeast corner of sec. 15, T. 1, R. 4 E., principal meridian.

Station mark: A bronze disk set in a stone. An arrow, cut in a stone, points to the station distant 0.43 meter. The station mark and stone are both 4 inches underground.

Orleans (Minnesota, Kittson County; C. H. Sinclair, 1912; 1928).—About one-half mile northeast of the town of Orleans and 4.6 miles south of International Boundary Monument 846; in sec. 19, T. 163 N., R. 48 W., fifth principal meridian; about 200 meters south of an old house and barn, and about 32 meters south of the center of the road.

Station mark: A bronze disk set in concrete with stones piled around it.

Kraska (Minnesota, Kittson County; C. H. Sinclair, 1912; 1928).—On a sand ridge nearly 2 miles almost due south of International Boundary Monument 851, in sec. 2, T. 163 N., R. 48 W., fifth principal meridian. The station is about 100 meters west of the road, 25 meters north of a wire fence, 5 meters west of another fence, and 53 meters northeast of a barn.

Station mark: A bench-mark post set in concrete, 3 feet in the ground.

Shock (Manitoba, Provencher District; C. H. Sinclair, 1912; 1928).—On a small ridge 2 miles almost due north of International Boundary Monument 851, and about one-fourth mile east of a schoolhouse; near the center of the north side of sec. 11, T. 1, R. 5 E. A Galician house is south-southeast about 130 meters.

Station mark: A bench-mark post set in concrete 1 foot in diameter, 3 feet in, and 1 foot out of the ground.

Casa (Manitoba, Provencher District; C. H. Sinclair, 1912; 1928).—About 2 miles north of International Boundary Monument 857, on very rocky ground 8 meters northeast of the southwest corner of sec. 14, T. 1, R. 6 E., principal meridian. There is a swamp one-fourth mile to the east and a house one-fourth mile south-southeast.

Station mark: A bench-mark post surrounded with concrete at the surface of the ground. An arrow cut in a boulder is 2.064 meters from the station in azimuth 191° magnetic. A second arrow cut in a boulder is 2.291 meters from the station in azimuth 148° magnetic.

Wood (Minnesota, Kittson County; C. H. Sinclair, 1912; 1928).—About 2 miles almost due south of International Boundary Monument 857; on flat sandy land in sec. 1, T. 163 N., R. 47 W., fifth principal meridian, 5.50 meters east of the quarter-section post on the west side of the section.

Station mark: A bench-mark post set 3 feet in the ground with 1 foot of concrete 10 by 10 inches at the surface of the ground around it.

Soft (Manitoba, Provencher District; C. H. Sinclair, 1912; 1928).—About 2¾ miles north of the International Boundary, midway between Monuments 860 and 861; about 100 meters north of the quarter-section line and about 150 meters west of the east side of sec. 17, T. 1, R. 7 E., principal meridian, and about 200 meters northwest of some houses. The station is located on the northwest corner of a large clump of poplars on the north and west of which is a swamp.

Station mark: A bench-mark post set 3 feet in the ground and surrounded at the surface with 1 foot of concrete.

Kelson (Minnesota, Kittson County; C. H. Sinclair, 1912; 1928).—About 1½ miles nearly due south of International Boundary Monument 861; on a grassy flat on the west edge of a small swamp; near the section line between secs. 33 and 34, T. 164 N., R. 46 W., fifth principal meridian, and about 200 meters north of the south line of the said sections.

Station mark: A bench-mark post set 3 feet in the ground and surrounded at the surface with 1 foot of concrete.

Vita (Manitoba, Provencher District; C. H. Sinclair, 1912; 1928).—About 4½ miles north of International Boundary Monument 864; about 50 meters west and 500 meters north of the southeast corner of sec. 26, T. 1, R. 7 E., principal meridian.

Station mark: A bronze disk in a concrete block 10 by 10 by 12 inches set firmly in the ground. The reference mark is an arrow, pointing toward the station, cut in a boulder 10 feet in diameter and 5 feet above the surface of the ground, 27.03 meters from the station in azimuth 66°35′.

Roseau (Manitoba, Provencher District; Minnesota, Kittson County; C. H. Sinclair, 1912; 1928).—On a slight ridge on the International Boundary 515 meters east of Monument 864.

Station mark: A cross cut in a 200-pound rock set firmly in the ground.

Caliento (Manitoba, Provencher District; C. H. Sinclair, 1912; 1928).—About 4¾ miles north of International Boundary Monument 871, in NW¼ sec. 19, T. 1, R. 9 E., principal meridian; on the south side of a peninsula which projects eastward into a swamp and which terminates about 120 meters to the east. The station is about 210 meters east of the west side of the section and about one-half mile north of a forested area.

Station mark: A bench-mark post set in concrete, 3 feet in the ground. The reference marks are: A tamarack tree 4.1 meters from the station in azimuth 295°; a rock 20.6 meters from the station in azimuth 202°; and a rock 25.0 meters from the station in azimuth 200°.

Suran (Manitoba, Provencher District; C. H. Sinclair, 1912; 1928).—Nearly 1 mile north of International Boundary Monument 877; on a sandy ridge on the east side of the road along the west line of sec. 6, T. 1, R. 10 E., principal meridian; and about 16 meters south of the traveled road running eastward. The station is about 25 meters northwest of the residence of the parish priest.

Station mark: A bronze disk set in concrete.

Sundown (Manitoba, Provencher District; C. H. Sinclair, 1912; 1928).—About 5½ miles north of International Boundary Monument 877; near the northeast corner of SW½ sec. 31, T. 1, R. 9 E., principal meridian, 6 meters east of the quarter-section line; among small poplars, about 70 meters south of the edge of an open swamp.

Station mark: A bronze disk set in concrete.

Duxby (Minnesota, Roseau County; C. H. Sinclair, 1912; 1928).—Near the post office in the town of Duxby; in SW¼ sec. 26, T. 163 N., R. 42 W., fifth principal meridian; about 100 meters south of Roseau River, 90 meters east of the store and post office, and in the south track of the traveled road.

Station mark: A bronze disk set in concrete.

Wampum (Manitoba, Provencher District; C. H. Sinclair, 1912; 1928).—About 1 mile north of the International Boundary, midway between Monuments 892 and 893; on a high ridge southwest of Canadian National Railway station Wampum; 35 meters south and 1 meter east of the northeast corner of sec. 1, T. 1, R. 12 E., principal meridian.

Station mark: A bronze disk set in concrete.

Sandy (Minnesota, Roseau County; C. H. Sinclair, 1912;1928).—About 9¾ miles south of the International Boundary; on a sandy ridge about 30 meters south of the northwest corner of sec. 17, T. 162 N., R. 40 W., fifth principal meridian; on the east side of the road limit.

Station mark: A bronze disk set in concrete.

Salol (Minnesota, Roseau County; C. H. Sinclair, 1912; 1928).—On the south side of the Great Northern Railway, 350 meters west of Salol station, 25 meters south of the railway track, between the railway and the highway, and 30 meters east of a north-and-south road. The station is on line with a church steeple and the kitchen window of Gustofson's house, both south of the station.

Station mark: A bronze disk set in a concrete block 10 by 10 by 18 inches in size.

Guibo (Minnesota, Roseau County; C. H. Sinclair, 1912; 1928).—On a sandy ridge 3 miles west of Warroad; about one-fourth mile south of the Great Northern Railway, and nearly due south of a house just north of the railway. The station is in SE½ sec. 26, T. 163 N., R. 37 W., fifth principal meridian, 50 meters east of the road on the north-and-south midsection line, and about 400 meters north of the south line of the section.

Station mark: A bronze disk set in a concrete block 8 by 8 by 16 inches in size.

Gull Island (Minnesota, Lake of the Woods County; C. H. Sinclair, 1913).—On the southern part of Lake of the Woods, on Cormorant Rock, a large rock in the lake, about 3½ miles west of Long Point, and about 1½ miles north of Rocky Point.

Station mark: A drill hole in the rock. Three other drill holes used for fastening signal guys are equally spaced about the station mark a few feet distant.

Gould (Manitoba, Provencher District; C. H. Sinclair, 1913).—On the west side of Lake of the Woods, about 1 mile south of the mouth of Reed River on the west shore of Buffalo Bay. The station is about 200 meters inland and is near the quarter post on the east line of sec. 18, T. 2 N., R. 17 E., fifth principal meridian. The station is surrounded by heavy timber.

Station mark: A bronze disk marked "U. S. & C. B. S." set in concrete flush with the ground.

GEORGIA STRAIT TO SUMMIT OF ROCKY MOUNTAINS, MINOR SCHEMES

Sumas Mountain (Washington, Whatcom County; E. C. Barnard, 1905).—About 5 miles east of Everson, on the north spur of Sumas Mountain, better known as Nooksack Mountain. This spur runs northward from a flat summit, and the station is about one-half mile down it on a bare spot just east of which there is a steep bluff. The station is 200 feet lower than the highest point of the mountain. It can be best reached from the north

Station mark: A cross in a stone set level with the surface of the ground. The reference mark is a bronze disk set in solid rock, 2.3 meters from the station in azimuth 235°38′.

Chilliwack (British Columbia, Fraser Valley District; J. J. McArthur, 1906; 1935).—On the western and lower summit of Sumas Mountain, about 10 miles west of Chilliwack and on the west side of the steep ravine about 1 mile west of the Sumas pumping station. The station is on an exposed rock in a circular grassy patch, about 30 meters in diameter, which is surrounded by trees. Elevation, about 2,600 feet.

Station mark: A bronze disk, 2 inches in diameter, with a triangle at the center.

Black (Washington, Whatcom County; G. T. Prinsep, 1935).—On the summit at the north end of Black Mountain, about 5 miles southwest of Cultus Lake. There is no trail up this mountain. In 1935 it was ascended from the ridge which extends toward International Boundary Monument 44. The mountain side has been burned over about half way to the top, and the dead trees which have fallen over make that part of the climb difficult. Elevation, about 5,000 feet.

Station mark: A nail in a wooden hub covered by a pile of stones. Station "Black" in this vicinity, established in 1906 and marked by a bronze disk, was not recovered in 1935.

Vedder (British Columbia, Fraser Valley District; Geodetic Survey of Canada, 1925; 1935).—On the highest part of the rocky ridge on Vedder Mountain, about 2 miles northwest of Cultus Lake.

Station mark: A standard Geodetic Survey of Canada station-mark disk leaded in solid rock. There are 2 standard reference-mark disks: the first is 12.66 meters from the station in azimuth 35°39′; the second is 4.51 meters from the station in azimuth 94°42′.

Liumchen (British Columbia, Fraser Valley District; G. T. Prinsep, 1935).—On the highest part of the rugged ridge between the end of the Liumchen trail on the Canadian side of the boundary and the Canyon Ridge trail on the United States side. The station is most easily accessible from the Canyon Ridge trail. It is a few feet from the north side of the bluff that drops precipitously in all directions except the south. It is 240.9 meters from International Boundary Monument 48, in azimuth 200°47′.

Station mark: A standard International Boundary Commission bronze-disk triangulation mark set in a drill hole in solid rock.

Thurston (British Columbia, Fraser Valley District; J. H. Kihl, 1935).—On the highest point on a ridge between the Fraser Valley and Chilliwack River, northeast of McGuire Mountain.

Station mark: A standard International Boundary Commission bronze-disk triangulation mark set in a boulder. Station "Thurston", on this ridge, marked by J. J. McArthur in 1908 by a bronze disk set in a boulder, was not recovered in 1935.

McGuire (British Columbia, Fraser Valley District; J. J. McArthur, 1906; 1935).—On the highest part of McGuire Mountain, about 5 miles southeast of the junction of Chilliwack River and Tamihi Creek. In 1935 the mountain was climbed from Tamihi Creek, near International Boundary Monument 50 and the station was approached along the ridge which is alternately covered with patches of heather and woods. The narrow summit is of friable rock; it slopes steeply in all directions except the southeast, where a narrow nose of jagged rock connects it with the lower ridge. Elevation, about 6,600 feet.

Station mark: A bronze disk 2 inches in diameter with a triangle in the center, set in a drill hole in bed rock.

Balan (British Columbia, Fraser Valley District; G. T. Prinsep, 1935).—About 3 miles south of McGuire Mountain and 1 mile south of Tamihi Creek. The station is on the nose of a low thickly wooded ridge extending northeast from the Canyon Ridge trail, midway between International Boundary Monuments 49 and 50. There are three vistas cut over the nose, and the station is in the most northern of them.

Station mark: A nail in a hub driven in the shaly ground with a small cairn over it.

Camas (British Columbia, Fraser Valley District; G. T. Prinsep, 1935).—On the ridge between McGuire and Red Mountains, about 2 miles southeast of McGuire. The station is on a rock bluff about 100 feet below the heather-covered culminating point of the ridge.

Station mark: A standard International Boundary Commission bronze-disk triangulation mark cemented in a drill hole in the bed rock.

Slesse (British Columbia, Fraser Valley District; J. H. Kihl, 1935).—On the summit of the third peak from the north, on a high ridge east of Silesia (Slesse) Creek, about 4 miles north of International Boundary Monument 54. From a point on the old Chilliwack Lake trail about 2 miles east of Silesia Creek a side trail leads up to a mining claim at Upper Pierce Lake. The ridge on the north side of this lake leads west and directly to the station.

Station mark: A rock drill, driven into the shaly rock surface, over which a 5-foot cairn was erected. Station "Silicia", on this peak, marked by J. J. McArthur in 1908 by a bronze disk, was not recovered.

Red (Washington, Whatcom County; J. H. Kihl, 1935).—On the summit of Red Mountain, 1½ miles south of the International Boundary and midway between Silesia Creek and Tamihi Creek. The station can be reached from the Red Mountain Mine near International Boundary Monument 54 by crossing the snowfield and climbing the glacier (which lies on the east side of the Red Mountain ridge) to the top of that ridge and then proceeding around to the southwest side of Red Mountain and thence up to its highest point. The final approaches to both this mountain and Monument 53 must be from the west; they can probably be more easily reached from Tamihi Creek than from Silesia Creek.

Station mark: A standard International Boundary Commission bronze-disk triangulation mark cemented into the rock, over which a 5-foot cairn was erected. Station "Red", on this mountain, marked by J. J. McArthur in 1908 by a bronze disk, was not recovered in 1935.

Silver (British Columbia, Fraser Valley District; J. J. McArthur, 1908; 1935).—On the summit of Silver Mountain, a high conical peak north of Chilliwack Lake. The station can be reached in 6 hours, from a point on the Chilliwack Lake trail about 2 miles west of the lake.

Station mark: A standard International Boundary Commission bronze-disk triangulation mark cemented into an old drill hole which was assumed to be the position of the original station and within a few feet of which the bronze disk set in 1905 to mark the station was found lying.

D (British Columbia, Fraser Valley District; J. H. Kihl, 1935).—On the ridge between Silesia Creek and Middle Creek, about 2 miles northeast of International Boundary Monument 55. There are six high peaks on this ridge and station "D" is on the fifth peak from the north. The three highest and most northern of these peaks are known as Pierce, Needle, and Canadian Tamihi Peaks. The station can be reached from Monument 55 by following the burnt-over ridge leading northeast to the foot of the peak, which can be climbed from the west side only. The station is about 5,000 feet above station "Power", which is on the bank of Silesia Creek.

Station mark: A standard International Boundary Commission bronze-disk triangulation mark cemented into the rock, over which a 4-foot cairn was erected.

E (British Columbia, Fraser Valley District; J. H. Kihl, 1935).—On the peak about 120 meters north of International Boundary Monument 56. It can be reached from Monument 55 by going northeast to the top of the ridge and thence south along the ridge to the station.

Station mark: A standard International Boundary Commission bronze-disk triangulation mark cemented into the rock.

North (British Columbia, Fraser Valley District; J. H. Kihl, 1935).—At the south end of the second highest peak on the ridge north of the draw which leads northeast from Silesia Creek at International Boundary Monument 55.

Station mark: A drill hole in rock.

South (British Columbia, Fraser Valley District; J. H. Kihl, 1935).—On the ridge south of the draw which leads northeast from International Boundary Monument 55. The station is distant from the monument about 1½ miles and is about one-half mile north of the boundary midway between Monuments 55 and 56.

Station mark: A drill hole in rock.

Power (Washington, Whatcom County; J. H. Kihl, 1935).—Just south of the International Boundary on the east side of Silesia Creek. The station is about 120 meters southeast of Monument 55, and is 3.54 meters from the northeast corner of the cabin at the power plant.

Station mark: A standard International Boundary Commission bronze-disk triangulation mark cemented into a boulder 4 feet in diameter, which protrudes about 2 feet above the surface of the ground.

F (Washington, Whatcom County; J. H. Kihl, 1935).—About 140 meters south of the International Boundary, on the peak about 1 mile west of Monument 57.

Station mark: A standard International Boundary Commission bronze-disk triangulation mark, cemented into the rock, over which a 5-foot cairn was erected.

G (Britis! Columbia, Fraser Valley District; J. H. Kihl, 1935).—On the high peak about 2 miles north and a little east of International Boundary Monument 58.

Station mark: A standard International Boundary Commission bronze-disk triangulation mark, cemented into the rock, over which a 5-foot cairn was erected.

Cope (British Columbia, Fraser Valley District; J. H. Kihl, 1935).—On high ground about 100 meters northwest of International Boundary Monument 59 and immediately north of a very large boulder which can be seen from the monument.

Station mark: A standard International Boundary Commission bronze-disk triangulation mark cemented into solid surface rock.

Middle (Washington, Whatcom County; J. J. McArthur, 1908; 1935).—On a sharp peak one-third mile south of International Boundary Monument 60, overlooking Hanging Lake.

Station mark: A bronze disk set in rock in 1908.

J (British Columbia, Fraser Valley District; J. H. Kihl, 1935).—On the north knob of the second peak from the north on the ridge running from the Chilliwack River along the west side of Chilliwack Lake; about 2½ miles north of the International Boundary.

Station mark: A standard International Boundary Commission bronze-disk triangulation mark cemented into the rock

H (British Columbia, Fraser Valley District; J. H. Kihl, 1935).—On the southern part of a high peak three-fourths mile north of International Boundary Monument 60 and on the same ridge. It may be reached by following the ridge from Monument 60 to the north side of a deep saddle in the ridge.

Station mark: A standard International Boundary Commission bronze-disk triangulation mark cemented into the rock.

L (British Columbia, Fraser Valley District; D. J. Fraser, 1935).—On a high peak on the ridge north of Depot Creek and east of Chilliwack Lake; about 2 miles north of the International Boundary and 2½ miles almost due east of the mouth of Depot Creek.

Station mark: A standard International Boundary Commission bronze-disk triangulation mark, cemented in rock, over which is a 5-foot cairn.

M (Washington, Whatcom County; D. J. Fraser, 1935).—On the ridge running southeast from Monument 64 and 1¼ miles from the monument. An old trail runs to Monument 64 from Depot Creek, leaving the Depot Creek trail about 2½ miles from Chilliwack Lake. From Monument 64 follow the ridge southeast to a small clump of scrub hemlocks on the last knoll. The station is just north of these trees. Beyond the station is a rocky canyon and then a steep and high rocky peak.

Station mark: A standard International Boundary Commission bronze-disk triangulation mark, cemented in rock, over which is a small cairn.

K (British Columbia, Fraser Valley District; D. J. Fraser, 1935).—On a bare knob on a shoulder running up from a point on the west shore of Chilliwack Lake 2 miles north of the International Boundary. This shoulder runs in a southwesterly direction; follow it to the second bare knob about 3,000 feet above the lake. There is a draw about 50 feet deep just west of the station. The station is directly across the lake from the mouth of Depot Creek.

Station mark: A standard International Boundary Commission bronze-disk triangulation mark, cemented in rock, over which is a 3-foot cairn.

N (Washington, Whatcom County; D. J. Fraser, 1935).—Easily recognized from Depot Creek; on top of a perpendicular cliff three-fourths mile south of International Boundary Monument 65. The station can be reached by crossing Depot Creek about one-fourth to one-half mile up from Monument 65, and climbing up a shoulder from the northeast to the flat top of the cliff. There is a sheer drop of about 500 feet from this cliff. The station is about 2½ meters back from the edge of the cliff.

Station mark: A standard International Boundary Commission bronze-disk triangulation mark, cemented in rock, over which is a small cairn.

Whitworth (British Columbia, Yale District; E. C. Barnard, 1905; 1935).—About 5 miles north of the International Boundary, on the third hill from Silver Creek, and on the third ridge from the Skagit River, on a sharp point of rotten rock not quite as high as the most northern one but better located for looking south.

Station mark: An aluminum disk set in a rock 2 feet square, over which is a 5-foot cairn.

P (British Columbia, Yale District; D. J. Fraser, 1935).—On the first ridge east of International Boundary Monument 68, on a round-topped rocky knoll about 1 mile north of the boundary.

Station mark: A standard International Boundary Commission bronze-disk triangulation mark, cemented in rock, over which is a 5-foot cairn.

Q (British Columbia, Yale District; D. J. Fraser, 1935).—On the highest point of the second ridge west of the Skagit River. The station is about 2 miles north of International Boundary Monument 69. It can be reached by following the boundary trail west from the Skagit River to the summit of the second ridge. The station is about 30 meters from the trail and will be easily found on the highest point.

Station mark: A standard International Boundary Commission bronze-disk triangulation mark, cemented in rock, over which is a 3-foot cairn.

S (British Columbia, Yale District; D. J. Fraser, 1935).—On the nearly bare knob, the second knob north of the International Boundary, on a high ridge immediately west of the Skagit River. The station is about 1 mile north along the ridge from Monument 70. The trail crosses the ridge one-quarter mile north of the boundary. From this point the ridge should be followed north to the second knob.

Station mark: A standard International Boundary Commission bronze-disk triangulation mark, set in concrete, over which is a small cairn.

T (Washington, Whatcom County; D. J. Fraser, 1935).—On a bare spot a short distance west of the summit of Little Jackass Mountain, where there is an open outlook to the north and west. The station can be reached from the Skagit trail about 2 miles south of the International Boundary.

Station mark: A standard International Boundary Commission bronze-disk triangulation mark set in cement with a few stones piled around the base of the signal which was erected over the mark.

Brush (British Columbia, Yale District; E. C. Barnard, 1904; 1935).—This station has been described under the names "Brush", "Brushy", and "Grassy." It is on the summit of a grass-grown peak with a few evergreen trees scattered about. It is about 2½ miles north of the International Boundary and 4½ miles east of the Skagit River. The most western of the Lightning (Quartet) Lakes lies at the foot of the peak 1½ miles southeast of the station.

Station mark: In 1935 the original station mark was found broken out of the drill hole. A new 3-inch bronze-disk station mark bearing the words "INTERNATIONAL BOUNDARY COMMISSION" was set in the original drill hole.

Rim (British Columbia, Yale District; Jesse Hill, 1935).—About three-fourths mile north of International Boundary Monument 76; on the bare peak on the north end of the ridge lying west of Pass Creek, the same ridge on which Monument 76 is situated. The station is about 150 meters southwest of the highest point of the mountain.

Station mark: A 3-inch bronze-disk station mark bearing the words "INTERNATIONAL BOUNDARY COMMISSION" set in a drill hole in rock.

Poley (Washington, Whatcom County; Jesse Hill, 1935).—About 0.75 mile south and 0.3 mile east of International Boundary Monument 73; on the north end of the rocky ridge that runs due north from Mount Hozomeen and about one-half mile distant from the peak of the mountain. The ridge is comparatively level at the station and from that point breaks down in a continuous slope to the north.

Station mark: A drill hole in solid rock.

Lone Mountain (British Columbia, Yale District; Jesse Hill, 1935).—About 0.7 mile north of the International Boundary, and a little east of Monument 75; on the open-topped mountain, in the forks of the headwaters of Lightning Creek, known as Lone Mountain. The station is on the south slope of the mountain about 30 meters from the top of the ridge and about 100 meters east of the peak of the mountain.

Station mark: A 3-inch bronze-disk station mark bearing the words "INTERNATIONAL BOUNDARY COMMISSION" set in a drill hole in rock.

Patrice (British Columbia, Yale District; Jesse Hill, 1935).—On the isolated mountain, 6,000 feet in elevation, lying in the forks of Similkameen (Cambrie) River and Castle Creek; about 2¾ miles north of the International Boundary and a little east of Monument 79. The station is on the south end of the crest of the mountain at a point where the steep rocky slope south to Castle Creek begins. There is a British Columbia Provincial survey triangulation station on the north end of the crest of the mountain, marked with a small bronze disk bearing the letters "B. C." but not intervisible with station "Patrice." No connection was made with it.

Station mark: A 3-inch bronze-disk station mark bearing the words "INTERNATIONAL BOUNDARY COMMISSION" set in a drill hole in ledge rock.

Mack (British Columbia, Yale District; Jesse Hill, 1935).—About 1.4 meters north of the International Boundary; on the high, sharp, rocky point of the ridge 1.2 miles west of Monument 79 and 0.7 mile east of Monument 78.

Station mark: A 3-inch bronze-disk station mark bearing the words "INTERNATIONAL BOUNDARY COMMISSION" set in a drill hole in ledge rock.

Callahan (British Columbia, Yale District; Jesse Hill, 1935).—About 1½ miles north of International Boundary Monument 78; on the summit of the ridge on the west side of Castle Creek and running northeast from Frosty Mountain. Stations "Frosty West", "Frosty", and "Patrice" are all on this ridge. The station is situated in an open place on the northeast end of a high knoll.

Station mark: A 3-inch bronze-disk station mark bearing the words "INTERNATIONAL BOUNDARY COMMISSION" set in a drill hole in a rock placed by hand, about 3 feet long and 2 feet wide.

Otness (British Columbia, Yale District; Jesse Hill, 1935).—On the southwest slope of the westernmost ridge of the mountain on which International Boundary Monument 83 is situated; about 670 meters nearly due north of Monument 82. The station is on the steep hillside about 45 meters below the comb of the ridge and approximately 90 meters south of the head of the second draw north of the International Boundary.

Station mark: A 3-inch bronze-disk station mark bearing the words "INTERNATIONAL BOUNDARY COMMISSION" set in a drill hole in a rock placed by hand, about 1 foot square.

Turret (Washington, Whatcom and Okanogan Counties; E. C. Barnard, 1904; 1935).—About 1 mile south of International Boundary Monument 77; on the crest of the high mountain on the main divide of the Cascade Range known as Turret or Castle Mountain.

Station mark: The station is unmarked. The point observed upon is the highest rocky pinnacle of the mountain as seen from the north.

Bunker Hill (Washington, Okanogan County; Jesse Hill, 1935).—About 1½ miles south and a little west of International Boundary Monument 88; on the summit of the rock dome on the northwesternmost end of Bunker Hill (Gray Mountain). The station is about one-half mile northwest of the U. S. Forest Service Bunker Hill lookout station.

Station mark: A 3-inch bronze-disk station mark bearing the words "INTERNATIONAL BOUNDARY COMMISSION" set in a drill hole in a rock about 2½ by 4 feet in surface dimensions.

Nemo (British Columbia, Yale District; Jesse Hill, 1935).—About 1½ miles north of the International Boundary and about 3 miles west of the Pasayten River; on the partly timbered knob on the southeast end of the ridge on which station "Roche" is situated. The station is about 12 meters southeast of the summit of the most southeastern knoll of this knob.

Station mark: A 3-inch bronze-disk station mark bearing the words "INTERNATIONAL BOUNDARY COMMISSION" set in a drill hole in a flat-topped rock about 12 inches by 18 inches in dimensions.

Ella (British Columbia, Yale District; Jesse Hill, 1935).—About 1¾ miles north of International Boundary Monument 87, about 1 mile east of the Pasayten River, and about 0.7 mile north of Peeve Creek; on a heavily timbered knob about 1,800 feet in elevation above the Pasayten River. The station is located on a small bench about 360 meters down the ridge running a little east of south from the summit of the knob. Lines of sight had to be cut through the heavy timber to all the stations sighted and the location of the station can be identified by the cuttings for many years. The station mark may be found by measuring 6.7 meters north and 1.2 meters west from the largest fir stump of the cuttings. There are many large fir trees to the south and west of the station.

Station mark: A 3-inch bronze-disk station mark bearing the words "INTERNATIONAL BOUNDARY COMMISSION" set in a drill hole in a ledge of rock lightly covered with earth.

Cathedral (Washington, Okanogan County; Jesse Hill, 1935).—This station supersedes station "Cathedral" of 1904 which was unmarked except by a cairn and could not be recovered. The station is on the extreme east end of the crest of the bold castellated crag about 8,600 feet in elevation locally known as Cathedral Peak. The peak is 0.8 mile south and a little west of International Boundary Monument 95. The station is about 3 meters west of the edge of the cliff.

Station mark: A 3-inch bronze-disk station mark bearing the words "INTERNATIONAL BOUNDARY COMMISSION" set in a drill hole in the ledge rock.

Walls (British Columbia, Yale District; Jesse Hill, 1935).—About 1¼ miles northeast of International Boundary Monument 96; on the most southern end of a high and rugged rocky mountain having several rock domes on its crest. The station is on the top of a high and prominent cliff somewhat below the top of the south end of the mountain. A pot hole in the rock, about the size of a large tub, and about 3 meters southeast of the station, holds water for some time after rains.

Station mark: A 3-inch bronze-disk station mark bearing the words "INTERNATIONAL BOUNDARY COMMISSION" set in a drill hole in the ledge rock.

Bosek (British Columbia, Yale District; Jesse Hill, 1935).—About three-fourths mile north of the International Boundary, 1.1 miles northeast of Monument 94, and 1.7 miles northwest of Cathedral Peak. The station is on the highest point of a high, bare, rocky peak (elevation about 8,200 feet) that breaks down on the north in a nearly vertical cliff. The station mark is about 3 meters from the edge of the cliff.

Station mark: A 3-inch bronze-disk station mark bearing the words "INTERNATIONAL BOUNDARY COMMISSION" set in a drill hole in a flat-topped rock about 2½ feet square and rising about 1 foot above the ground.

Kay (British Columbia, Yale District; Jesse Hill, 1935).—About 0.9 mile nearly due north of International Boundary Monument 91 and 0.7 mile west of the Ashnola River; on the extreme northeast end of the first prominent ridge north of Monument 91.

Station mark: A 3-inch bronze-disk station mark bearing the words "INTERNATIONAL BOUNDARY COMMISSION" set in a drill hole in level ledge rock about 3½ by 5 feet in dimensions.

Rambo (Washington, Okanogan County; Jesse Hill, 1935).—About 0.6 mile south and a little east of International Boundary Monument 94 and 1½ miles west of Cathedral Peak; on the north end of a spur ridge that breaks down in cliffs to the north and east. The station is on the highest point of the ledge, 3 meters from where it breaks down to the east and 25 meters from where it breaks down to the north.

Station mark: A 1-inch drill hole, 3 inches deep, in outcropping ledge rock.

Crawford (Washington, Okanogan County; Jesse Hill, 1935).—About 1.2 miles south of the International Boundary, southeast of Monument 100 and southwest of Monument 101; on the highest point of a high bare mountain.

Station mark: A 3-inch bronze-disk station mark bearing the words "INTERNATIONAL BOUNDARY COMMISSION" set in a drill hole in a large rock.

Giles (British Columbia, Yale District; Jesse Hill, 1935).—About 0.6 mile north and 0.2 mile west of International Boundary Monument 100; on the summit of a high rocky point directly overlooking the deep canyon of Haig Creek to the west.

Station mark: A 1-inch drill hole in rock.

Mix (Washington, Okanogan County; Jesse Hill, 1935).—About one-half mile southwest of International Boundary Monument 99; on the north end of a narrow ridge lying between two deep ravines and pointing toward Monument 99. The station is about midway between the sides of the ridge and about 18 meters back or south of the precipitous end of the ridge.

Station mark: A 1-inch drill hole, 3 inches deep, in an exposure of bed rock about 6 feet square.

Earle (British Columbia, Yale District; Jesse Hill, 1935).—On the east end of a spur ridge one-half mile northwest of International Boundary Monument 99. The station is on top and about 3 meters back from the edge of a cliff facing east.

Station mark: A drill hole 1 inch in diameter and 3 inches deep in the rock.

Manley (British Columbia, Yale District; Jesse Hill, 1935).—About 0.7 mile north of the International Boundary and 0.9 mile northeast of Monument 104. The station is on the highest part of a bare rocky knoll, on the extreme east end of a high ridge and directly overlooking the extreme west head of Snehumption Creek.

Station mark: A 3-inch bronze-disk station mark bearing the words "INTERNATIONAL BOUNDARY COMMISSION" set in a drill hole in a flat outcropping rock roughly 4 feet by 4 feet in size.

Jordan (Washington, Okanogan County; Jesse Hill, 1935).—About 0.7 mile west and 0.25 mile south of International Boundary Monument 105. The station is on the highest part of a bare rocky knoll at the extreme north end of a high spur ridge breaking steeply down to Snehumption Creek to the north.

Station mark: A 3-inch bronze-disk station mark bearing the words "INTERNATIONAL BOUNDARY COMMISSION" set in a drill hole in a flat-topped rock 2 feet by 4 feet in size and rising about 18 inches out of the ground.

Little Chopaka (Washington, Okanogan County; U. S. Geological Survey, 1901; 1904).—On a sharp rocky peak of Chopaka Mountain about 8 or 10 miles northwest of Loomis. Station "Chopaka" is on the culminating peak of the ridge, 400 feet higher, and about 2½ miles to the northwest.

Station mark: The station was originally marked by a cairn and signal. No other mark is described.

Palmer (Washington, Okanogan County; J. G. Hefty, 1930).—About 1½ miles south of the International Boundary and one-half mile east of the Similkameen River. The station is about 1,500 feet above the river, on a partly bare spur of the mountain running north to a low pass. It is about 700 feet lower than the crest of the mountain to the south of the station.

Station mark: An International Boundary Commission bronze-disk triangulation mark set in a large rock in place.

Molson (Washington, Okanogan County; U. S. Geological Survey; C. H. Sinclair, 1904; 1930).—On the summit of the high bare knob 2 miles northeast of Molson and one-half mile southwest of International Boundary Monument 127.

Station mark: A drill hole in solid rock.

Taylor (British Columbia, Yale District; C. H. Sinclair, 1904; 1930).—On a high rocky peak 1.3 miles nearly due north of International Boundary Monument 129.

Station mark: An aluminum disk set in a drill hole in rock.

Gill (British Columbia, Yale District; J. G. Hefty, 1930).—On the west side of Rock Creek, about one-third mile north and a little west of International Boundary Monument 126. The station is on the side of the hill and on the second rock knob north of Monument 126, and is about 500 feet higher than the monument.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a boulder planted for the purpose.

Bride (British Columbia, Yale District; J. G. Hefty, 1930).—On the west side of Rock Creek about 1 mile north and a little east of International Boundary Monument 126; about 2 miles south of Bridesville. The station is on the knoll at the east end of a long gravel ridge that runs out into the valley. There is a deep railroad cut through the point of the ridge about 200 meters east of the station.

Station mark: A 2-inch bronze-disk station mark set in a rock 8 by 10 by 15 inches in size, firmly planted in the ground.

Son (Washington, Ferry County; J. G. Hefty, 1930).—A few feet south of the International Boundary and on the brow of the hill about three-fourths mile east of Rock Creek. It is on a little flat bench about 30 feet wide that runs level along the side hill for a considerable distance.

Staton mark: A bronze disk set in a boulder weighing about 175 pounds embedded firmly in the ground.

Penny (British Columbia, Yale District; J. G. Hefty, 1930).—On the crest of a little rocky ridge; N. 6° E., 166 meters distant from International Boundary Monument 128.

Station mark: A drill hole about 1 inch deep in solid bed rock. A copper penny is battered into the bottom of the drill hole.

Hurst (Washington, Okanogan County; J. G. Hefty, 1930).—On the summit of a knob about 200 meters southwest of International Boundary Monument 129.

Station mark: A 2-inch bronze disk inscribed "U. S. & C. B. SURVEY" set in rock.

Myncaster (British Columbia, Yale District; J. G. Hefty, 1930).—About 1¼ miles north of the International Boundary, on a high, bare ridge on the west side of and overlooking Myers Creek; about three-fourths mile nearly north of the now abandoned Vancouver, Victoria and Eastern Railway station Myncaster. A long narrow lake in Myers Creek Valley, about one-half mile to the northeast, can be seen from the station.

Station mark: A 2-inch bronze disk inscribed "U. S. & C. B. SURVEY" set in a drill hole in a very hard stone weighing about 150 pounds, firmly embedded in the ground.

Rock (British Columbia, Yale District; C. H. Sinclair, 1904; 1930).—About 1½ miles north of the International Boundary, on the high rocky hill in the forks of Kettle River and Myers Creek, covered with a thin growth of fir and tamarack. The hill rises abruptly from the east and south, but gradually from the north and west, from either of which sides it may be easily ascended.

Station mark: Originally a drill hole in solid rock. In 1930 a bronze disk marked "U. S. & C. B. SURVEY" was set in the drill hole.

Johnny (British Columbia, Yale District; J. G. Hefty, 1930).—The station is on the summit of the ridge, in azimuth 193°40′30′′, 85.74 meters distant from International Boundary Monument 134.

Station mark: A 2-inch bronze disk inscribed "U. S. & C. B. SURVEY" set in a drill hole in a boulder weighing about 150 pounds, firmly set in the ground.

Frank (Washington, Ferry County; J. G. Hefty, 1930).—A few feet south of the International Boundary and about half way between Monuments 139 and 140; on the west edge of a spur ridge sloping steeply to the north. The ridge has been logged off, leaving but a few scattered trees standing.

Station mark: A 2-inch bronze disk inscribed "U. S. & C. B. SURVEY" set in outcropping bed rock flush with the general ground level. A small pile of rocks was left over the station mark.

Irene (British Columbia, Yale District; C. H. Sinclair, 1904; 1930).—On a prominent, grassy hill overlooking the town of Midway, about 3 miles northwest of the town. The hill is north of the road, from which it rises gradually.

Station mark: A 1/2-inch drill hole in a rock ledge.

Danville (British Columbia, Yale District; C. H. Sinclair, 1904; 1930).—On the northwest slope of a grassy hill about one-half mile east of the crossing of the International Boundary by the Kettle River near Carson. The hill slopes steeply for a short distance from the station and then gradually to the river bottom.

Station mark: A drill hole in a large rock which is probably the outcrop of a ledge.

Carson Azimuth Station (British Columbia, Yale District; Washington, Ferry County; C. H. Sinclair, 1901; 1930).—On the International Boundary, on the edge of a plateau of cultivated land about 150 meters west of Carson, British Columbia, and about 1,200 meters north of Danville, Washington. The station is 3.5 meters west of International Boundary Monument 154.

Station mark: An iron pipe 3½ inches in diameter firmly set in the ground, with a brass cap attached to the top of it bearing the inscription "South Meridian 1901." A north meridian mark similar to this is set 624 meters to the north.

Castle (British Columbia, Yale District; C. H. Sinclair, 1904; 1930).—About 2½ miles east of the village of Cascade, about 1½ miles north of International Boundary Monument 168, on the summit of the high, wooded peak east of Kettle River.

Station mark: A 2-inch aluminum disk cemented in a drill hole in a solid rock projecting 6 or 8 inches above the ground and about 14 by 36 inches in lateral dimensions.

Bowen (British Columbia, Yale District; Washington, Stevens County; C. H. Sinclair, 1904; 1930.)—On the south end of the high, isolated, and partly wooded peak between the north and the south forks of Deep Creek; 6.27 meters west of the center of Monument 169.

Station mark: A cross cut in the rock with a chisel. The rock is very brittle and badly shattered.

Otto (British Columbia, Yale District; J. G. Hefty, 1930).—About 2 miles east of Cascade, on the outer edge of a rock rim at an elevation of about 2,950 feet on the south slope of the mountain; directly opposite a sharp south bow of Kettle River from which the river runs nearly straight for about three-fourths mile in a northeasterly direction parallel with the highway.

Station mark: A 2-inch bronze disk inscribed "U. S. & C. B. SURVEY" set in a drill hole in the rock.

Baldy (Washington, Stevens County; J. J. McArthur, 1904; 1932).—About 5 miles west of the Clark Fork (Pend-d'Oreille) River and 5 miles south of the International Boundary; on the highest point of Whaleback Mountain, the highest point between the Columbia River and the Clark Fork River.

Station mark: U. S. Geological Survey bronze-disk station mark set in a drill hole in rock.

Churchill Lookout (Washington, Stevens County; D. F. Chisholm, 1933).—In the Colville National Forest, 8 miles east of Kettle River and 2¾ miles south of International Boundary Monument 171. This is a lookout tower of the U. S. Forest Service. About 10 miles from Orient on the Orient-Northport road a road goes north to the Big Iron Mine. The station is on the continuation of this road and is 3 miles from the junction of the mine road with the Orient-Northport road. There is no difficulty in taking a car to the station. There is no permanent ground mark.

Cone (British Columbia, Yale District; D. F. Chisholm, 1933).—On a mountain 2¾ miles northwest of International Boundary Monument 173, and almost north of mile post 22 on the Cascade-Rossland highway. The station is on the exposed rock 150 feet south of the highest point.

Station mark: A plain bronze-disk triangulation station mark.

Silver Crown (Washington, Stevens County; D. F. Chisholm, 1933).—On Silver Crown Mountain 1 mile southeast of the town of Northport. The station is on a rock outcrop about 60 meters north of the highest point. It is most easily reached by proceeding along the road on the north side of the mountain for a distance of 1½ miles from Northport and then climbing the east side of the mountain.

Station mark: A plain bronze-disk triangulation station mark.

Melvin (Washington, Stevens County; J. G. Hefty, 1930).—On the west side of a ridge about 1 mile southeast of Monument 181 and about 0.6 mile south of the International Boundary. It is on a skull-shaped granite outcrop which is about 15 feet in diameter. Another outcrop of about the same size, of jagged rock, is about 8 meters to the eastward. The summit of the ridge east of the station is about 400 feet above. The station is located at an elevation of about 2,900 feet.

Station mark: A 2-inch bronze disk inscribed "U. S. & C. B. SURVEY B. M.", on which the "B. M." is

partly obliterated, cemented in a drill hole in the rock.

Waneta (British Columbia, Kootenay West District; J. G. Hefty, 1930).—On a ridge 1½ miles northwest of the railroad depot at Waneta, British Columbia. It is on a bare rock ledge on the east side of the ridge at an elevation of about 3,100 feet. It is about 180 meters southwest from the highest point of the ridge.

Station mark: A 2-inch bronze disk cemented into a drill hole in the rock.

Rail (British Columbia, Kootenay West District; Washington, Stevens County; J. G. Hefty, 1930).—On the rim of the plateau on the east side of the Columbia River, and very near the International Boundary. It is 619.8 meters due east of Monument 181.

Station mark: A piece of railroad rail set on end and projecting about 3 feet above the ground. This mark was set by C. H. Sinclair in 1901 for a mark on the tangent to the 49th parallel as observed from a latitude station near where Monument 181 now stands.

Crescent (Washington, Stevens County; D. F. Chisholm, 1934).—On the hill southwest of Crescent Lake. Station mark: A drill hole in a loose rock.

South Fork (Washington, Pend Oreille County; J. J. McArthur, 1904; U. S. Geological Survey; 1934).— About 2½ miles south of the International Boundary; on the summit of Gypsy Mountain, the second high point of the ridge which extends south from Monument 192.

Station mark: Originally a drill hole in rock. In 1934 the station was found marked by a standard U. S. G. S. bronze-disk station mark, but apparently not in the exact location of the original station. The disk was occupied as the station mark.

Stags Leap (British Columbia, Kootenay West District; J. J. McArthur, 1904; 1934).—About 1 mile west and 3½ miles north of International Boundary Monument 192; on the highest part of the high and isolated peak known as Lost Mountain.

Station mark: Originally a drill hole in rock. In 1934 the old station mark could not be recovered and a new station was established and marked with a standard International Boundary Commission bronze-disk station mark set in solid rock. The new station is probably about 6 meters southwest of the original station.

Mawer (British Columbia, Kootenay West District; D. F. Chisholm, 1934).—One-half mile west and three-fourths mile north of International Boundary Monument 191.

Station mark: A standard International Boundary Commission bronze-disk triangulation mark set in solid rock.

Dagon (British Columbia, Kootenay West District; D. F. Chisholm, 1934).—About one-half mile east and 1 mile north of International Boundary Monument 193.

Station mark: A standard International Boundary Commission bronze-disk triangulation mark set in solid rock.

Mundy (Washington, Stevens County; D. F. Chisholm, 1934).—About one-fourth mile west and 1 mile south of International Boundary Monument 193, on the north end of Gypsy Mountain.

Station mark: A drill hole in solid rock.

Halma (Washington, Stevens County; D. F. Chisholm, 1934).—About 1¼ miles east and 1½ miles south of International Boundary Monument 193.

Station mark: A standard International Boundary Commission bronze-disk triangulation mark set in solid rock.

Great Butte (British Columbia, Kootenay West District; D. F. Chisholm, 1934).—About one-half mile west and 2 miles north of International Boundary Monument 194.

Station mark: A standard International Boundary Commission bronze-disk triangulation mark set in solid rock, over which is a cairn.

Monk (British Columbia, Kootenay West District; J. J. McArthur, 1904; 1934).—About one-half mile east and 4 miles north of International Boundary Monument 195, on the west end and on the highest point of a high, square mountain. The station is a little east of north of Big Snowy Mountain.

Station mark: The original station mark was a drill hole in rock. In 1934 the station was occupied by the International Boundary Commission and re-marked by setting a standard International Boundary Commission bronze-disk station mark in solid rock. The new mark is in the approximate position of the old mark.

Little Snowy (Idaho, Bonner County; D. F. Chisholm, 1934).—On Little Snowy Mountain about 10 meters north of a U. S. Forest Service lookout cabin. The trail to this station leaves the South Fork of Salmon River 1 mile south of the International Boundary.

Station mark: A standard International Boundary Commission bronze-disk triangulation mark set in solid rock.

Continental (Idaho, Bonner County; J. J. McArthur, 1904; 1934).—On the highest point of Continental Mountain. A United States Forest Service lookout tower is on the mountain.

Station mark: The original mark was a drill hole in rock. In 1934 the station could not be recovered and a new station was established and marked by a standard International Boundary Commission bronze-disk station mark set in a slightly loose rock. The lookout is a few feet west of the station.

Sack (British Columbia, Kootenay West District; D. F. Chisholm, 1934).—About 1 mile east and 1¼ miles north of International Boundary Monument 196, on the east end of a long ridge.

Station mark: A standard International Boundary Commission bronze-disk triangulation mark set in solid rock.

Center (Idaho, Boundary County; J. J. McArthur, 1904; 1934).—About 1½ miles south of the International Boundary, on the last northern knob or ridge west of Blue Joe Creek and the road to the Continental Mine.

Station mark: In 1934 the original mark, a drill hole in rock, could not be recovered. A new station was established and marked with a standard International Boundary Commission bronze-disk station mark set in solid rock.

Parch (British Columbia, Kootenay West District; D. F. Chisholm, 1934).—About 1 mile east and 2 miles north of International Boundary Mounument 198, on the south end of a flat-topped mountain.

Station mark: A standard International Boundary Commission bronze-disk triangulation mark set in solid rock.

Facer (British Columbia, Kootenay West District; D. F. Chisholm, 1934).—About one-fourth mile east and 1½ miles north of International Boundary Monument 200 and about 30 meters south of the top of the knoll.

Station mark: A standard International Boundary Commission bronze-disk triangulation mark set in solid rock.

Duff (British Columbia, Kootenay West District; D. F. Chisholm, 1934).—About 1½ miles north of International Boundary Monument 201, and several hundred feet southeast from the top of the knoll at the break of the slope overlooking Boundary Creek valley.

Station mark: A standard International Boundary Commission bronze-disk triangulation mark set in solid rock

Nupe (British Columbia, Kootenay West District; D. F. Chisholm, 1934).—About one-half mile east and 1 mile north of International Boundary Monument 199, at the south end of the south shoulder of the mountain north of the last bridge on Boundary Creek.

Station mark: A standard International Boundary Commission bronze-disk triangulation mark set in solid rock.

Saddle (Idaho, Bonner County; J. J. McArthur, 1904; 1934).—On Saddle Mountain about 30 meters south of the highest point. There is an 8-mile trail to the station, starting from the Grass Creek road a short distance from where the road crosses the International Boundary.

Station mark: In 1934 the original station mark could not be recovered and a new station was established and marked with a standard International Boundary Commission bronze-disk station mark set in a flat-topped rock. There is a U. S. Forest Service lookout tower a few feet southwest of the station.

Wood (British Columbia, Kootenay West District; J. J. McArthur, 1904; 1934).—About one-half mile east and about 2 miles north of International Boundary Monument 201, on the crest of and near the middle of the hogback ridge extending northeast from station "Duff."

Station mark: The original mark was a drill hole in rock. In 1934 this mark was not positively identified. A standard International Boundary Commission bronze-disk station mark was set in a slight depression in the solid rock.

Hall (Idaho, Boundary County; Jesse Hill, 1934).—On Hall Mountain on the first high round dome north of Hall Lookout of the U. S. Forest Service. The dome or rounded knob is timbered on top with spots of prairie on the south side. The station is on the east brink of the top, possibly 30 or 40 feet lower than the highest point and is surrounded by a thick growth of jack pines about 25 feet high. An observing tower 18 feet high was built to see over the tops of trees to the north and east. The tower was eccentric to the station mark. A trail from Hall Lookout to a patrol lookout farther north passes by the station.

Station mark: A 3-inch bronze-disk station mark, bearing the words "INTERNATIONAL BOUNDARY COMMISSION" set in a large round-topped boulder just north of a flat-topped rock about 3 feet square and 1 foot high. The eccentric distance from the tower to the mark is 12.65 meters. The directions from the tower to the mark are: Station "Mission", 0°00'; mark, 167°33.5'.

Shep (Idaho, Boundary County; Jesse Hill, 1934).—About 4½ miles southwest of Porthill, Idaho; on the nose of the high ridge south of Smith Creek, about 2,400 feet above the floor of the valley. The ridge breaks down from the "nose" very precipitously on the north, east, and south, approaching very nearly to a slope of 45 degrees. The station is on the extreme east end of the "nose", a little below the crest which is nearly level for 60 meters to the westward. It commands a clear view to the north, east, and south.

Station mark: A 3-inch bronze-disk station mark, bearing the words "INTERNATIONAL BOUNDARY COMMISSION" set in a drill hole in exposed solid granite bedrock.

Hall Lookout (Idaho, Boundary County; Jesse Hill, 1934).—The U. S. Forest Service lookout tower on Hall Mountain, the high mountain south of the International Boundary lying between the Kootenai Valley on the west and Mission Creek on the east.

Station mark: The apex of the square roof of the tower. No ground mark was set.

Mission (Idaho, Boundary County; C. H. Sinclair, 1905; 1934).—On a rocky elevation one-half mile south of the International Boundary and overlooking Mission Creek to the west. The station is on the west end of the west spur of the mountain that station "Harvey" is on. (See description of "Harvey".)

Station mark: In 1934 the original drill hole in a ledge of rock, marking the station, was recovered. A 3-inch bronze-disk station mark bearing the words "INTERNATIONAL BOUNDARY COMMISSION" was set in the drill hole.

Harvey (Idaho, Boundary County; C. H. Sinclair, 1905; 1934).—On the crest of the ridge between the Moyie Valley on the east and Mission Creek on the west; 0.6 mile south of the International Boundary; on the same ridge and southwest of Monument 212; accessible over U. S. Forest Service roads and trails from Round Prairie.

Station mark: In 1930 the station was recovered as formerly described. It was re-marked by setting a bronze-disk station mark, bearing the words "INTERNATIONAL BOUNDARY COMMISSION", in the original drill hole in rock.

Border (British Columbia, Kootenay East District; U. S. Geological Survey, 1900; C. H. Sinelair, 1904; 1934).—On the summit of Border Mountain, the first mountain on the International Boundary, west of the Moyie River. The station is on the western rock rim of the highest part of the mountain and is 95 meters northwest of International Boundary Monument 214. The station is easily reached by a 2-hour climb from Kingsgate, British Columbia, or Eastport, Idaho.

Station mark: The station was recovered, in 1934, and found marked by a copper bolt stamped "U. S. G. S." set vertically in a deep crevice in the outcropping rock and packed in place with fine broken stone. The bolt was removed and replaced by a 3-inch bronze disk bearing the words "INTERNATIONAL BOUNDARY COMMISSION." There being no solid rock at the station that could be drilled, the crevice was cleaned and chipped out to firm rock and filled with cement grout in which the disk was set approximately 1 foot below the surface of the rock outcrop.

Harper (British Columbia, Kootenay East District; Jesse Hill, 1934).—This station supersedes a former station "Harper" of 1904 which could not be recovered. It is located on the southwest slope, near the top of a hill, 1½ miles north and one-third mile east of Kingsgate, British Columbia, and in sight against the skyline from Kingsgate. There are a number of bare spots interspersed with timber on the hill. The station is useful only for points within its southern hemicircle. A hub with a nail in it and bits of a broken signal were found where the original description called for "a drill hole in flat rock and small cairn above it."

Station mark: A 3-inch bronze-disk station mark, bearing the words "INTERNATIONAL BOUNDARY COMMISSION" set in a large boulder firmly embedded in the ground.

Perry (British Columbia, Kootenay East District; Jesse Hill, 1934).—On the east slope of the mountain west and across the valley from Border Mountain; one-half mile west and 1.1 miles north of International Boundary Monument 213. The station is on an open spot on the prominent spur ridge that comes down between the waters running north into Little Moyie River and the waters running south into Round Prairie Creek. The station is about 1,100 feet above the floor of the marshy valley.

Station mark: A cross cut in the surface of a large boulder in place.

Speer (British Columbia, Kootenay East District; Jesse Hill, 1934).—About 1½ miles north of International Boundary Monument 227; 1½ miles west and 1 mile north of the elbow or big bend of West Fork of Yaak River. The station is on the south nose of the north-and-south ridge on which station "Lodge" is located. The slopes to the south and east of the station have been logged off and burned over. There is green timber on the west slope. Clearing had to be done for all lines of sight.

Station mark: A 3-inch bronze-disk station mark bearing the words "INTERNATIONAL BOUNDARY COMMISSION" set in a drill hole in a large, firmly embedded boulder.

Fork (British Columbia, Kootenay East District; Jesse Hill, 1934).—On the high partly open end of the mountain spur between the main forks of the North Fork of Yaak River; 2 miles north of International Boundary Monument 231.

Station mark: A 3-inch bronze-disk station mark, bearing the words "INTERNATIONAL BOUNDARY COMMISSION", cemented into a drill hole in solid rock.

Lick (Montana, Lincoln County; Jesse Hill, 1934).—One mile west of the North Fork of Yaak River and 1½ miles south of the International Boundary; on a sharp rocky spur on the north end of a north-and-south ridge paralleling the river. The station is about 300 feet below and some distance north of the highest point of the ridge. This is not the original station "Lick" of 1904, though probably near it; the original station could not be recovered as described. However, the remains of an old signal were found a few feet from the present station.

Station mark: A bronze-disk station mark bearing the words "INTERNATIONAL BOUNDARY COM-MISSION" set in a drill hole in a large flat rock outcrop.

Gold (British Columbia, Kootenay East District; Jesse Hill, 1934).—On the summit of Canadian Caribou Mountain; on the same ridge as station "Caribou" and Boundary Monument 236, and 1½ miles north of the monument. The mountain is nearly bare of trees and is easily recognized by its prominence.

Station mark: A 3-inch bronze-disk station mark, bearing the words "INTERNATIONAL BOUNDARY COMMISSION", cemented into a drill hole in a rock 18 by 18 by 16 inches in size, set with its top surface flush with the ground.

Wood Lookout (Montana, Lincoln County; Jesse Hill, 1934).—The U. S. Forest Service lookout tower on Wood Mountain; about 2 miles east of the North Fork of Yaak River and about 2 miles south of the International Boundary; on the high south end of the mountain.

Station mark: The apex of the square roof of the tower. No ground mark was set.

Sam (Montana, Lincoln County; Jesse Hill, 1934).—This is not station "Sam" of 1904 which was destroyed. A small rock, about 6 inches in diameter with a shallow depression cut in the top of it, was found in 1934, but in so unstable a condition that it was not accepted, and a new station was established near it. The new station is approximately on the International Boundary on the east edge of a bench about one-third mile west of Monument 241. The ground slopes steeply from the station to the east, and is covered with a thick growth of timber. The station sees to the eastward only.

Station mark: A 3-inch bronze-disk station mark bearing the words "INTERNATIONAL BOUNDARY COMMISSION" set in a drill hole in a large boulder firmly implanted in the ground.

Gateway Azimuth Station (British Columbia, Kootenay East District; Montana, Lincoln County; C. H. Sinclair, 1901; 1934).—On the International Boundary on the bench just east of Gateway, Montana; 180.6 meters west of Boundary Monument 245.

Station mark: A 4-inch iron pipe with a brass cap, projecting about 16 inches above the ground. A like pipe for the north mark on the meridian was set in the edge of the woods 681 meters to the north.

Scott (British Columbia, Kootenay East District; C. H. Sinclair, 1904; 1932).—About 5 miles east of Gateway, Montana; 1,000 meters north of the International Boundary and about 600 meters west of Phillipps Creek; on a bare, flat-topped hill with many loose stones scattered over it.

Station mark: A drill hole in a rock about level with the surface of the ground.

Kiln (Montana, Lincoln County; W. M. Dennis, 1932).—About 5½ miles east of Gateway and about one-fourth mile south of the International Boundary; on the summit of a sharp point of limestone on the foothills west of Phillipps Creek; about 500 feet above the floor of the valley and just above an old lime kiln.

Station mark: A drill hole in the rock.

Monument 247 ecc. (British Columbia, Kootenay East District; Montana, Lincoln County; W. M. Dennis, 1932).—About 5 miles east of Gateway, Montana, and on the true line of the boundary, 71.835 meters west of Monument 247.

Station mark: A drill hole with a copper penny in it, in a limestone boulder 10 inches in diameter set with its top surface 12 inches below the surface of the ground. The surface mark is a drill hole in a limestone boulder 18 inches in diameter by 12 inches in depth set flush with the ground.

Muchuck (British Columbia, Kootenay East District; Jesse Hill, 1933).—About 1 mile northwest of International Boundary Monument 257; on the heavily wooded ridge between the two main creeks flowing into the north side of Frozen Lake. The ridge has several bare rock exposures. The station is on one of these about 500 feet below the summit.

Station mark: A copper nail set in cement in a drill hole surrounded by a triangle cut in a large rock in place.

Bud (Montana, Flathead County; Jesse Hill, 1933).—In the extreme northwest corner of Flathead County, 51.38 meters from International Boundary Monument 256, in azimuth 317°33′.

Station mark: An eightpenny nail in a hub 4 inches in diameter over which is a 4-foot cairn.

Point Edward (British Columbia, Kootenay East District; Jesse Hill, 1933).—On the southwest shoulder of King Edward Mountain, in the forks of Starvation Creek.

Station mark: A twentypenny nail driven in the shale rock. The southwest corner of a large diamond-shaped rock is 4.3 meters from the station in azimuth 219°. The northeast corner of the same rock is 7.9 meters from the station in azimuth 245°.

Akamina (British Columbia, Kootenay East District; Jesse Hill, 1933).—On a red rock point N. 12° W., 1.6 miles from International Boundary Monument 271, and just east of a low gap between the Akamina and North Kintla Creek watersheds.

Station mark: A copper penny driven in a hole in the shale rock with a 5-foot cairn over it.

Goat (British Columbia, Kootenay East District; Montana, Flathead County; Jesse Hill, 1933).—On the International Bounday, on the east side of Kintla Creek and about 23 meters west of the rock wall of the south spur of Red Mountain.

Station mark: A cross cut in flat rock.

Red Mountain (British Columbia, Kootenay East District; C. H. Sinclair 1905; 1933).—On the high peak on the Akamina Ridge locally known as Red Mountain; about one-half mile north of the International Boundary and about one-half mile due south of Wall Lake.

Station mark: A high red cairn. No center mark is recorded.

SUMMIT OF ROCKY MOUNTAINS TO LAKE OF THE WOODS, MINOR SCHEMES

Campbell No. 1 (Montana, Glacier County; C. H. Sinclair, 1909).—About 1¼ miles south of the International Boundary and 1½ miles west of Waterton Lake; on the summit of the high knob on the northeast spur of Mount Campbell and about one-half mile distant from the highest peak of the mountain.

Station mark: A cairn. No center mark is recorded.

Cleveland (Montana, Glacier County; U. S. Geological Survey, 1901; 1909).—On the summit of Mount Cleveland in Glacier National Park. This mountain, one of the highest in the Park, is on the dividing ridge between the waters of Little Kootenai Creek on the north and Belly River on the east. It has a cliff about 4,000 feet high on the north and east.

Station mark: An aluminum disk cemented in a flat rock buried in the ground under the center of a cairn 8 feet high.

Belly East (Montana, Glacier County; C. H. Sinclair, 1909).—About 3 miles south of the International Boundary and about 3 miles west of Belly River; on the ridge north of the east end of Glenns Lakes. The station is on the eastern summit of the ridge. Station "Belly" is on the western summit of the same ridge about 600 meters distant.

Station mark: Probably a drill hole in the rock with a cairn over it.

Chief North (Montana, Glacier County; C. H. Sinclair, 1909).—About 3.6 miles south of the International Boundary, on the eastern of the two ridges running northward from Chief Mountain. The station is on a knoll, practically bare, about 200 meters up the slope, southwest of a wooded hill.

Station mark: A drill hole in a stone set in place.

Rankin (Montana, Glacier County; J. G. Hefty, 1921).—On the north slope of the first hill south of the International Boundary at Monument 293 and approximately S. 13° W., 770 meters from the monument.

Station mark: A bronze disk set in a rock about 1 by 2 feet in size, placed flush with the surface of the ground.

Arnold (Alberta, Lethbridge District; J. G. Hefty, 1921).—On a flat-topped hill running east and west about one-half mile south of the St. Marys River; about 1.6 miles N. 20° E. from International Boundary Monument 293. The station is about 18 meters west of the west side of a north-and-south road allowance.

Station mark: A bronze disk set in outcropping ledge rock.

Quartz (Alberta, Lethbridge District; C. H. Sinclair, 1910).—About 45 meters southwest of the highest part of a knoll 700 meters northwest of International Boundary Monument 325.

Station mark: A drill hole within a triangle cut in a quartz ledge showing an exposure of about 15 by 24 inches nearly flush with the ground. A cairn was erected over the mark.

Miller (Montana, Toole County; J. G. Hefty, 1921).—On a rocky hump on high rolling ground about 1¼ miles southwest of International Boundary Monument 328; about 90 meters north of the southwest corner of sec. 5, T. 37 N., R. 4 W., principal meridian.

Station mark: A drill hole within a triangle cut in the top of a very large and solid granite boulder.

Enright (Saskatchewan, Maple Creek District; J. J. McArthur, 1909).—About 2¾ miles north of International Boundary Monument 427; in NE¼ sec. 15, T. 1, R. 23 W., third meridian. The station is on the highest part of the Cherry Ridge escarpment.

Station mark: A bronze disk set in a boulder.

Fire (Montana, Valley County; C. H. Sinclair, 1910).—About 1.4 miles southeast of International Boundary Monument 506; on one of the buttes on the northwest edge of the plateau on the west side of the West Branch of Poplar River.

Station mark: A drill hole within a triangle cut in a granite boulder.

Bully (Saskatchewan, Wood Mountain District; C. H. Sinclair, 1911).—About 200 meters north of the International Boundary, 0.9 mile west of Monument 546; in SW¼ sec. 6, T. 1, R. 24 W., second meridian. The station is on the northwest point of a flat tableland overlooking the valley of the West Fork of Beaver Creek.

Station mark: A bronze disk in the top of a concrete block set about 2 feet in the ground.

Bob (Saskatchewan, Weyburn District; C. H. Sinclair, 1911).—About 0.7 mile north-northwest of International Boundary Monument 561; in W½ sec. 1, T. 1, R. 21 W., second meridian. The station is on the southeast slope near the top of a hill just north of a narrow coulee running east and west.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a concrete block 6 by 6 by 16 inches in size.

Dahl (Saskatchewan, Weyburn District; C. H. Sinclair, 1911).—About three-fourths mile N. 25° E. of International Boundary Monument 577; in NE¼ sec. 4, T. 1, R. 17 W., second meridian. The station is on a tableland, a short distance from its east edge.

Station mark: A bronze disk set in a concrete block with a small cairn built over it.

Ulan (Montana, Sheridan County; C. H. Sinclair, 1911).—On the east edge of a plateau overlooking the valley to the east; about three-fourths mile southwest of International Boundary Monument 578; in NE¼ sec. 4, T. 37 N., R. 57 E., principal meridian.

Station mark: A bronze disk marked "U. S. & C. B. SURVEY" set in a concrete block with a small cairn over it.

Center XVIII (North Dakota, Bottineau County; 1918).—About one-half mile southeast of International Boundary Monument 708 and about one-half mile east of Hartley Lake. The station is on the apex of a sharp and prominent knoll.

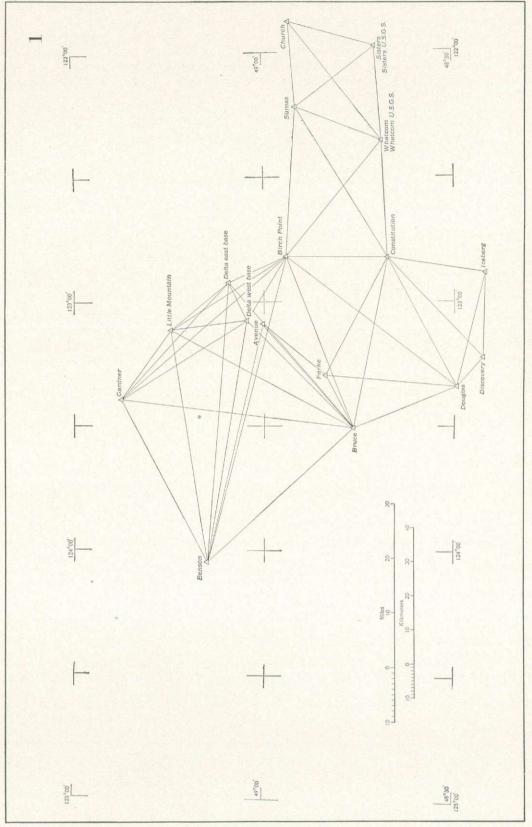
Station mark: The surface mark is a bronze disk set in a granite boulder 10 by 12 by 20 inches, whose top is flush with the ground. The subsurface mark is a cross cut with a chisel in the surface of a flat black stone 6 by 14 by 20 inches, set 2 feet below the surface of the ground.

Emerson Railroad Tower (Manitoba, Provencher District; 1912).—The railroad signal-tower at the crossing of the Canadian National and the Canadian Pacific Railroads in the city of Emerson.

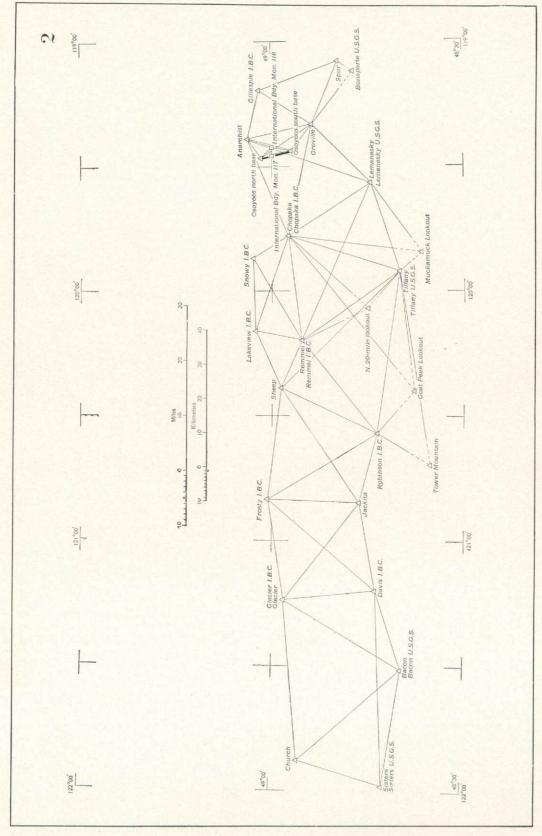
Station mark: The center of the tower.

Emerson Astronomic Station (Manitoba, Provencher District; 1912; 1928).—In the city of Emerson, 125.36 meters north of the International Boundary; 346 meters south and 13.3 meters east of the southeast corner of Morris and Second Streets.

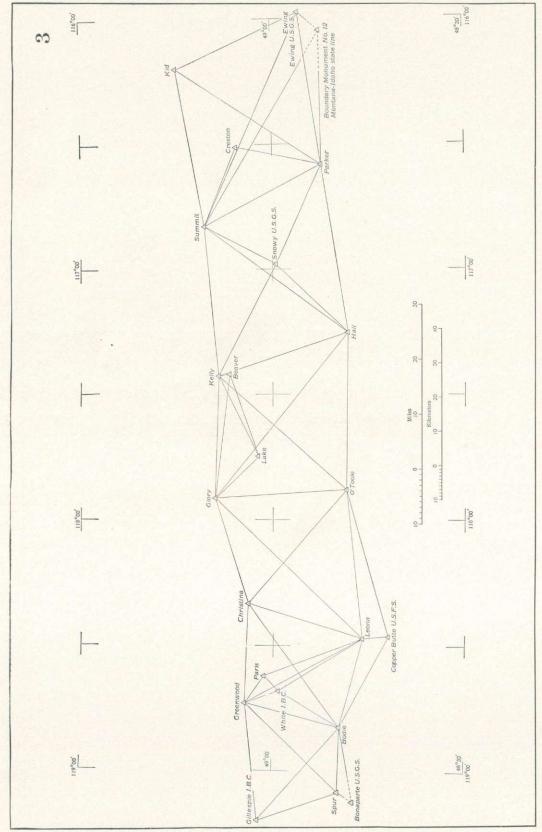
Station mark: A concrete instrument stand or pier. Probably a copper bolt for center mark.



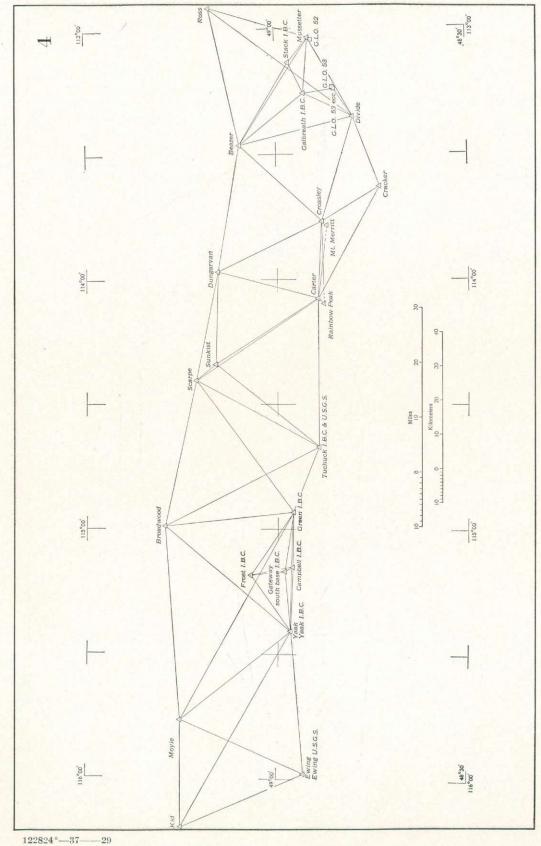
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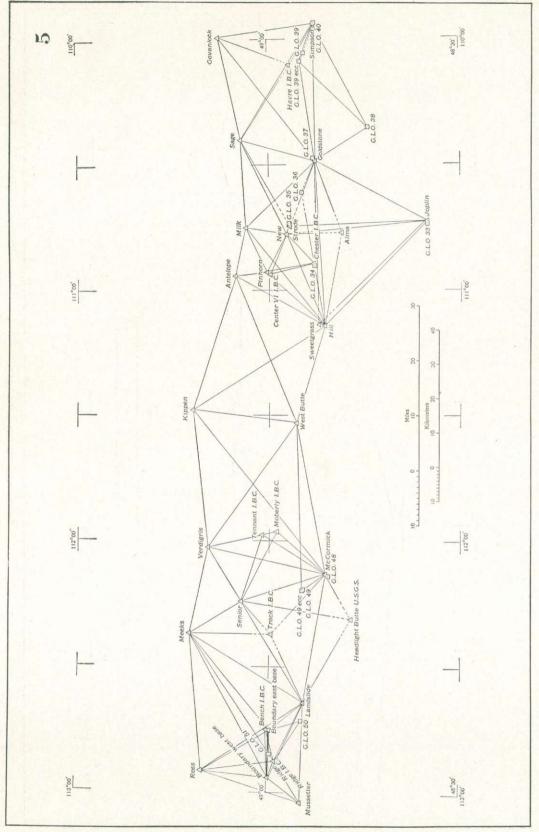
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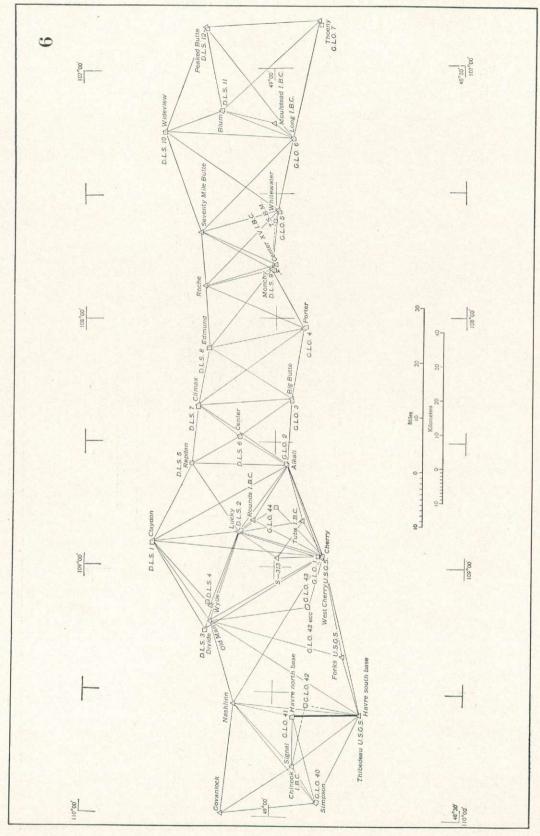
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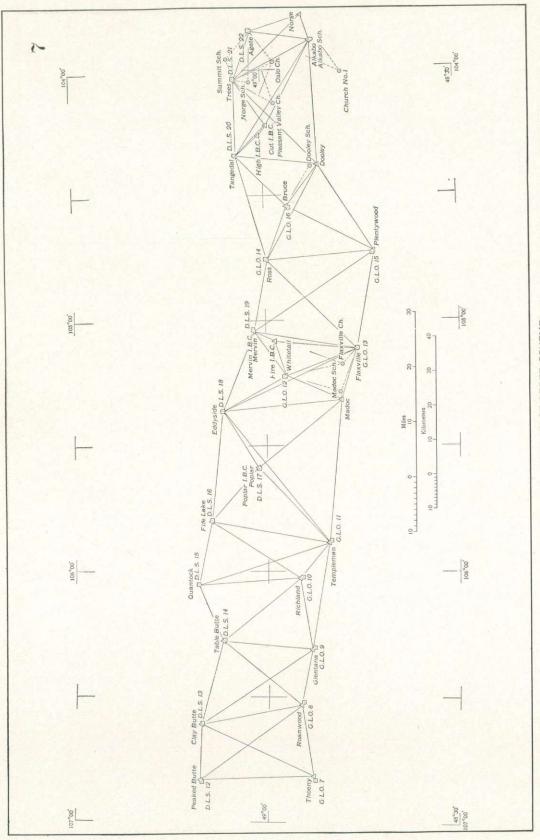
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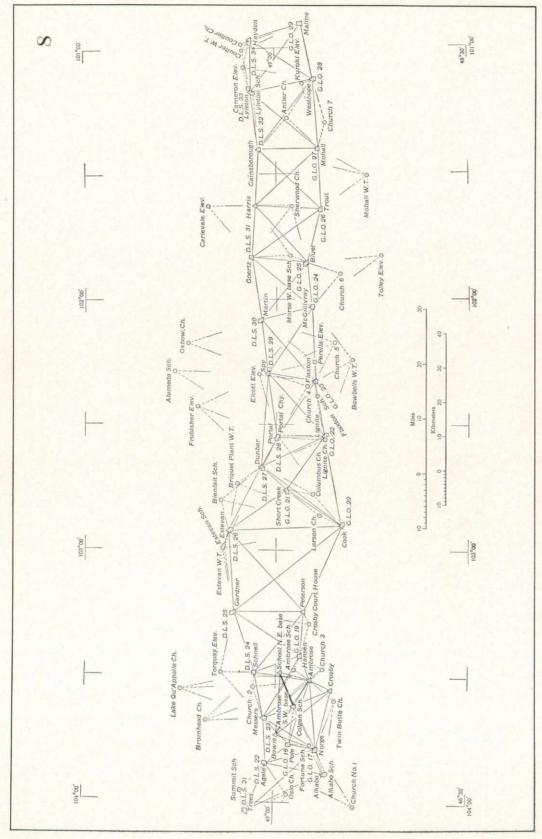
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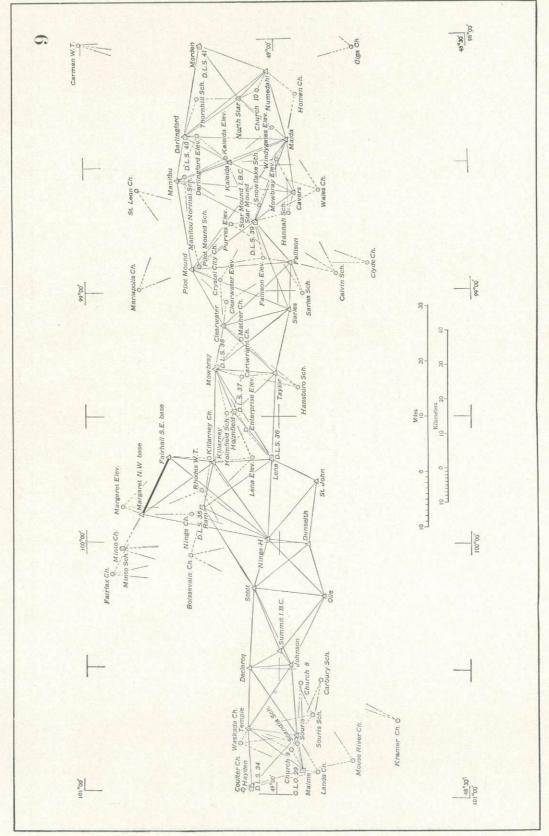
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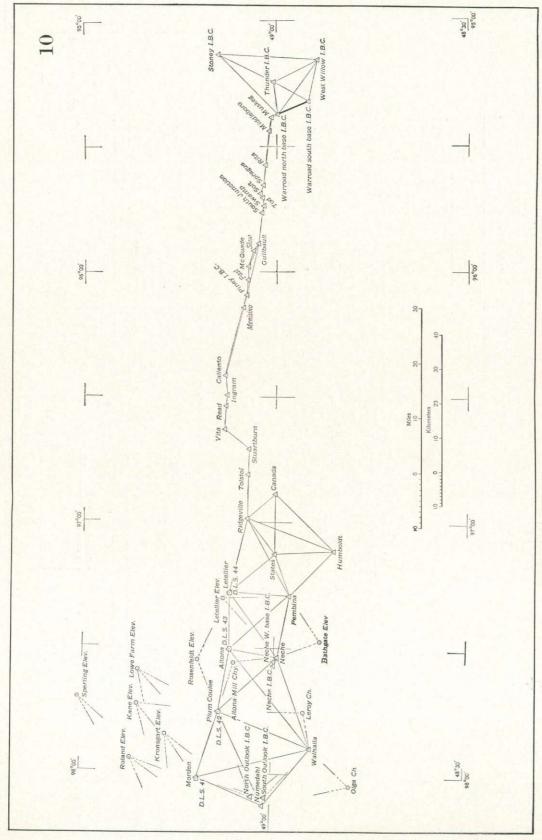
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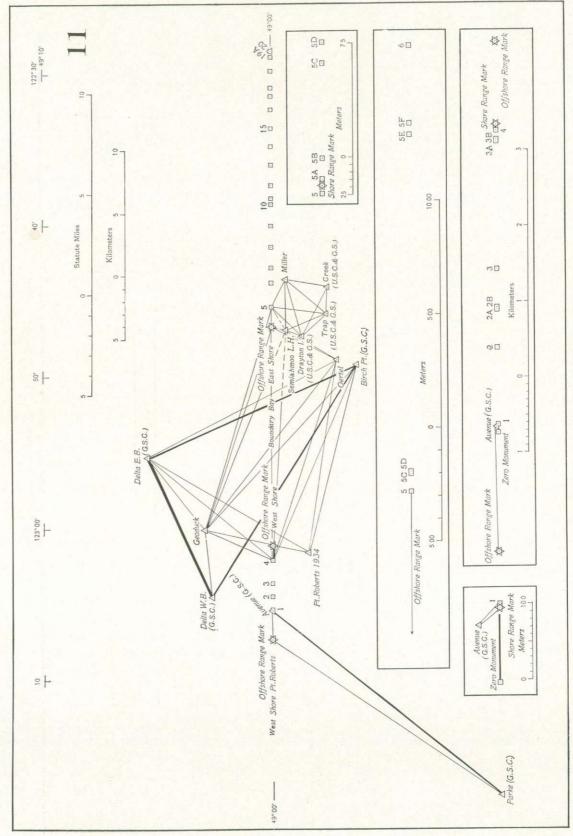
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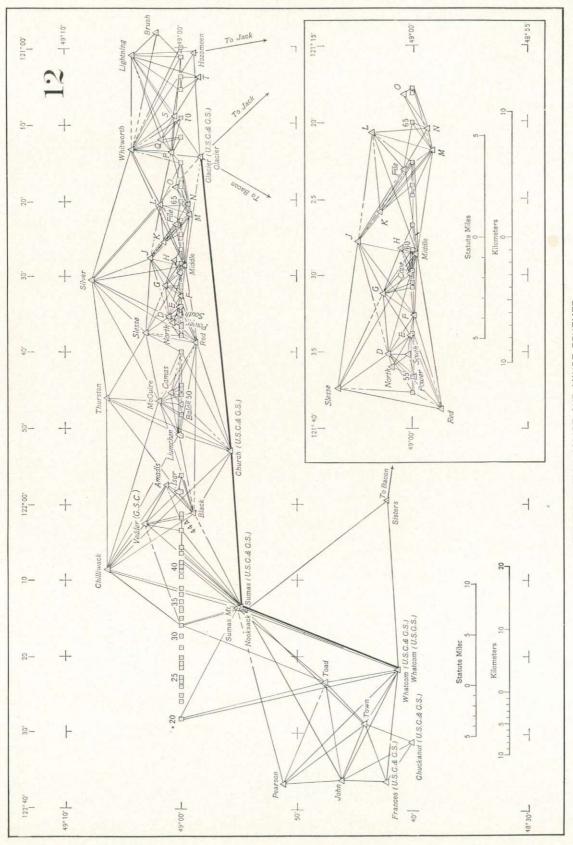
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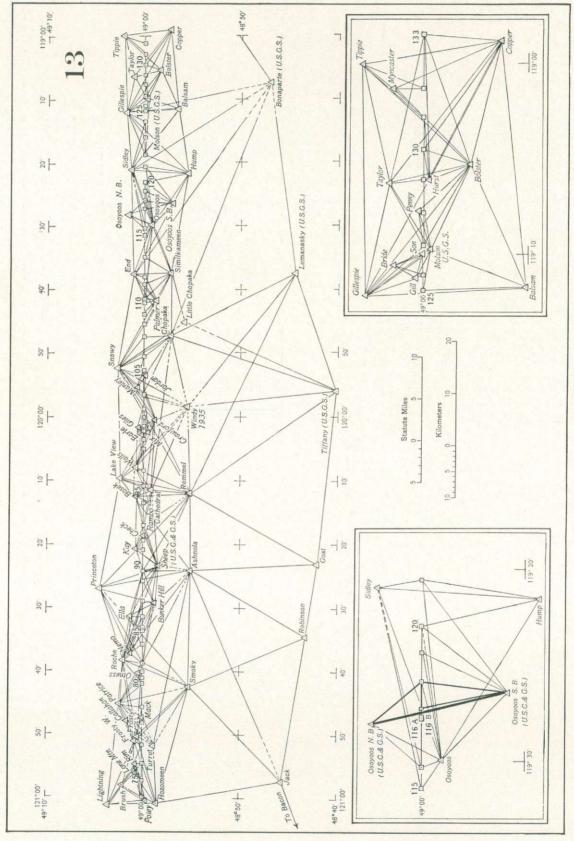
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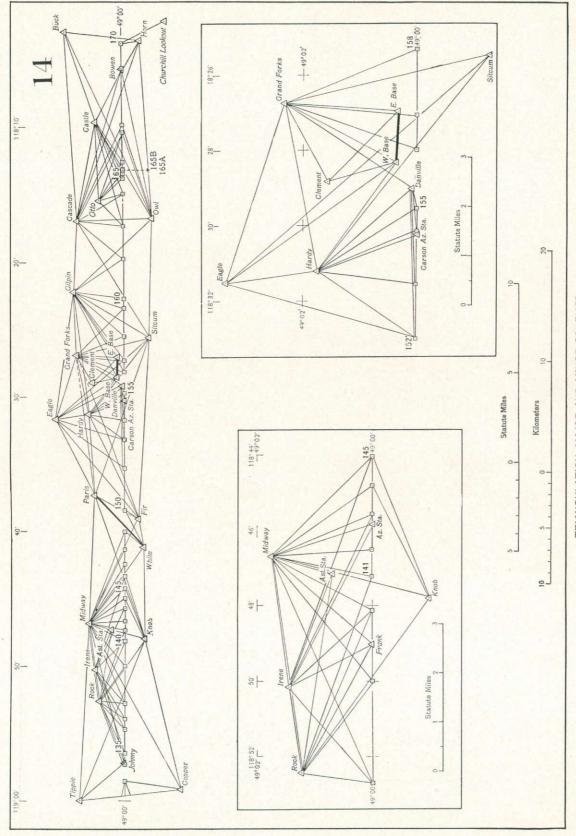
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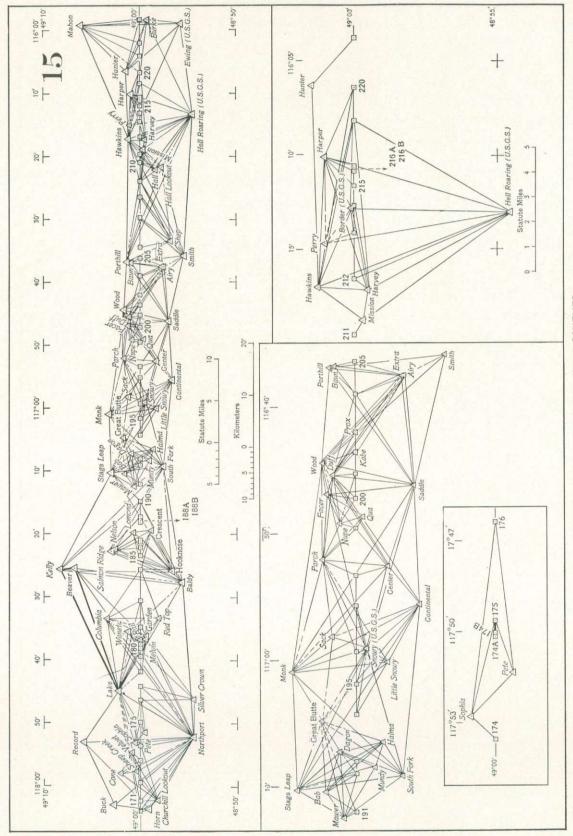
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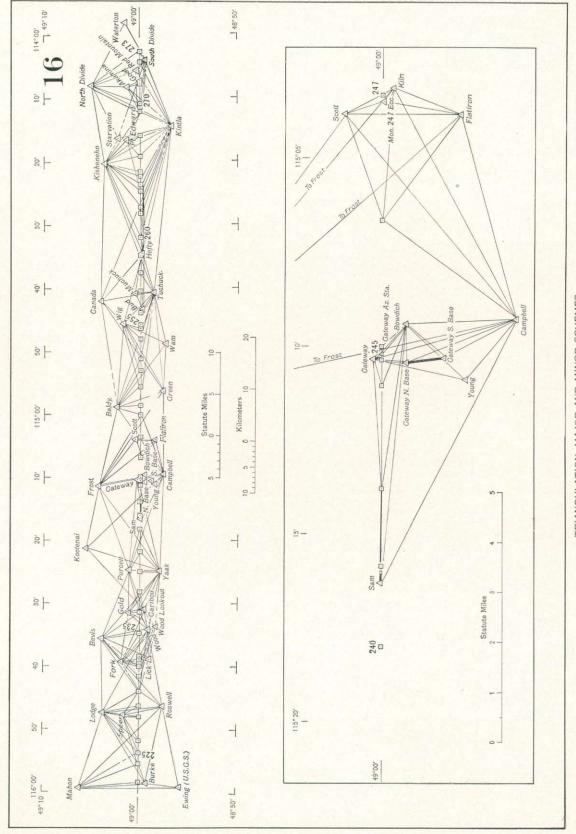
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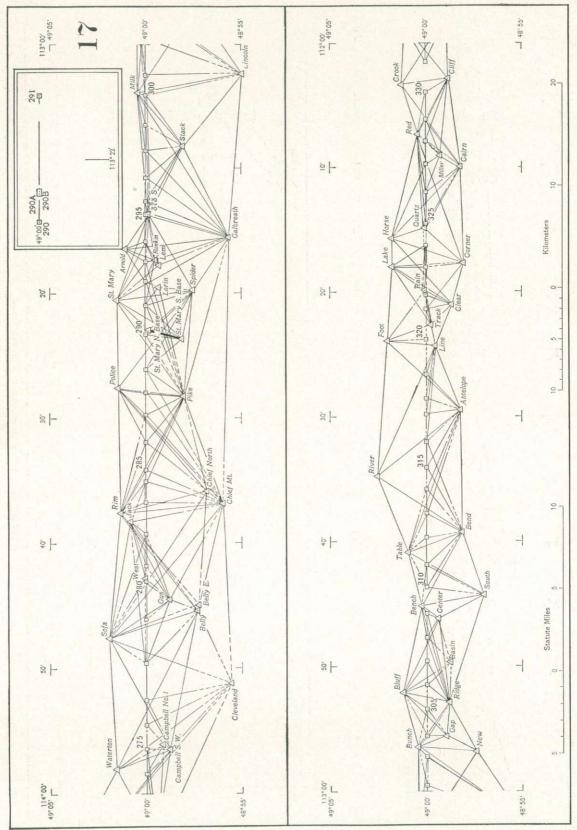
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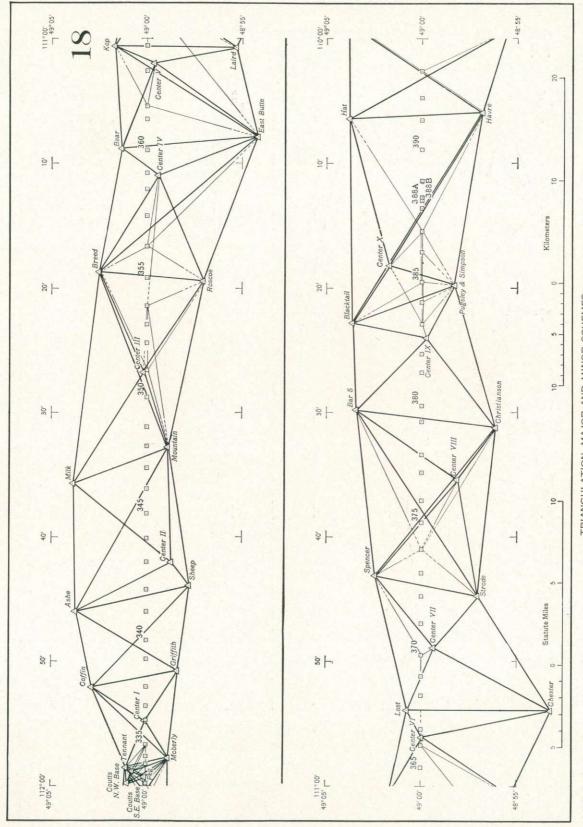
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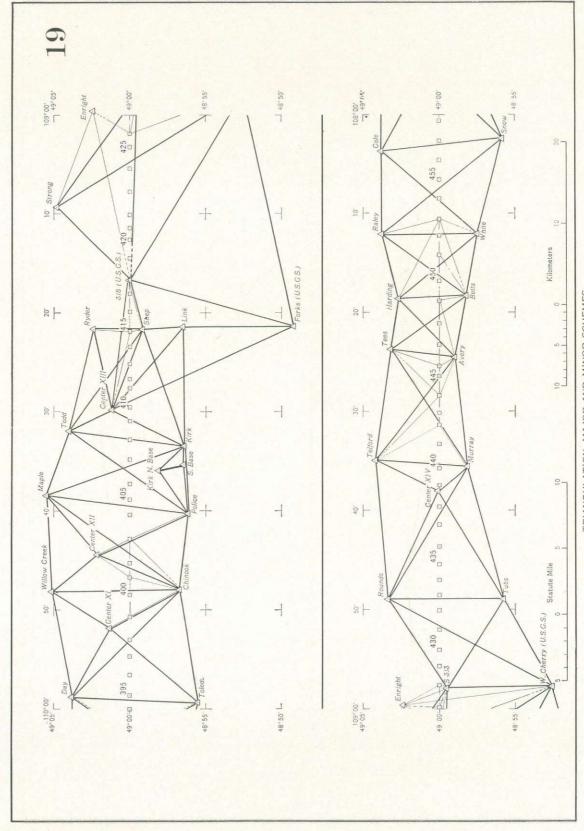
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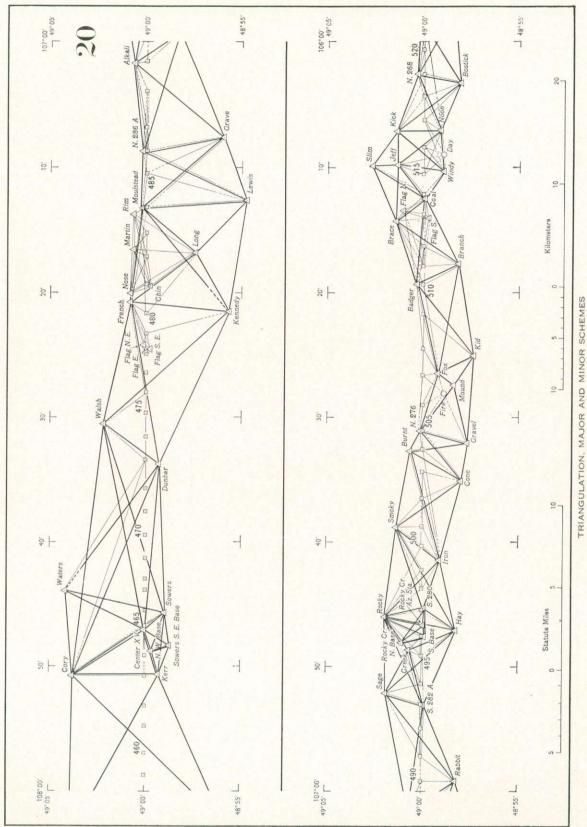
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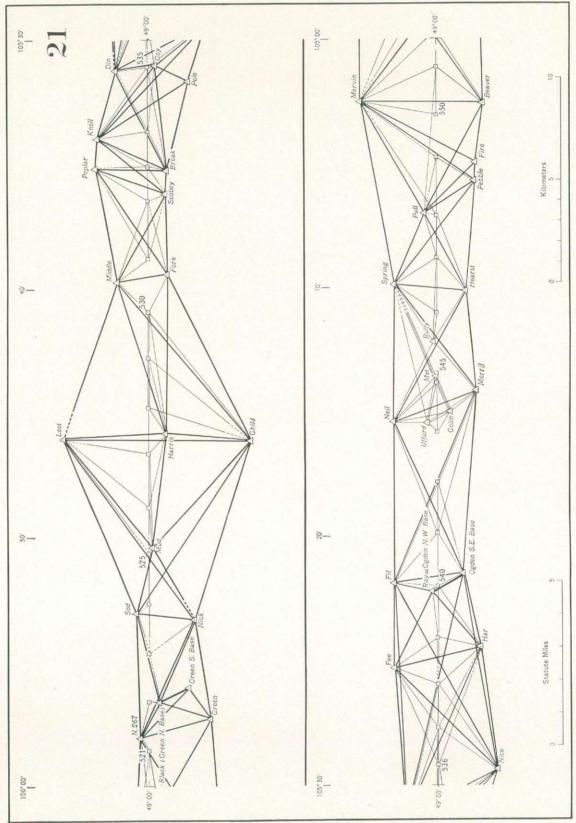
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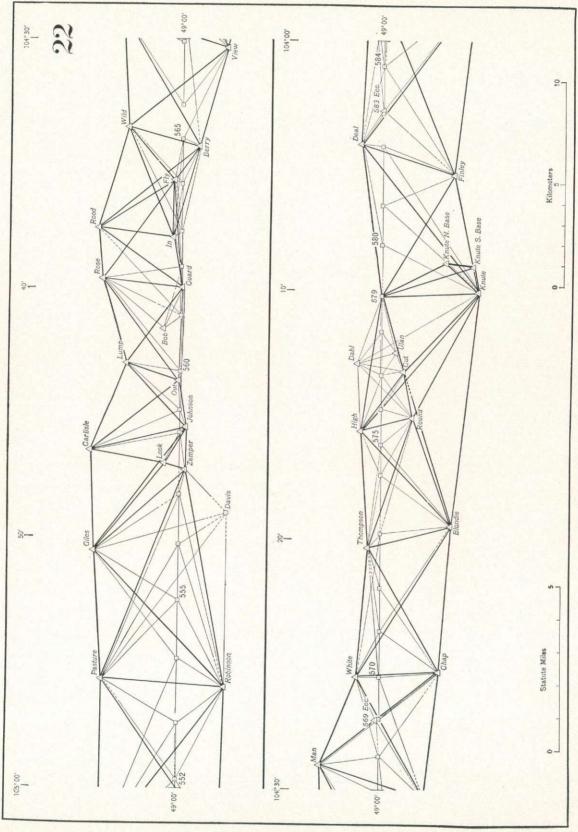
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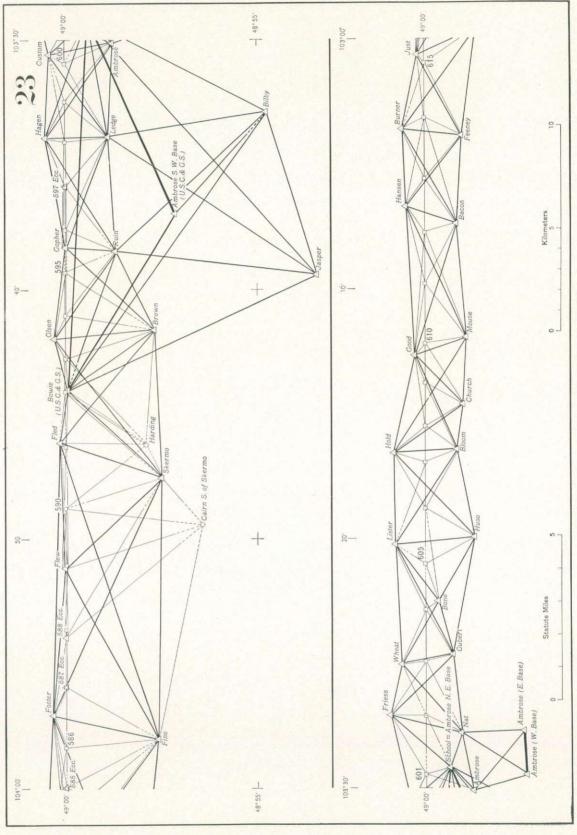
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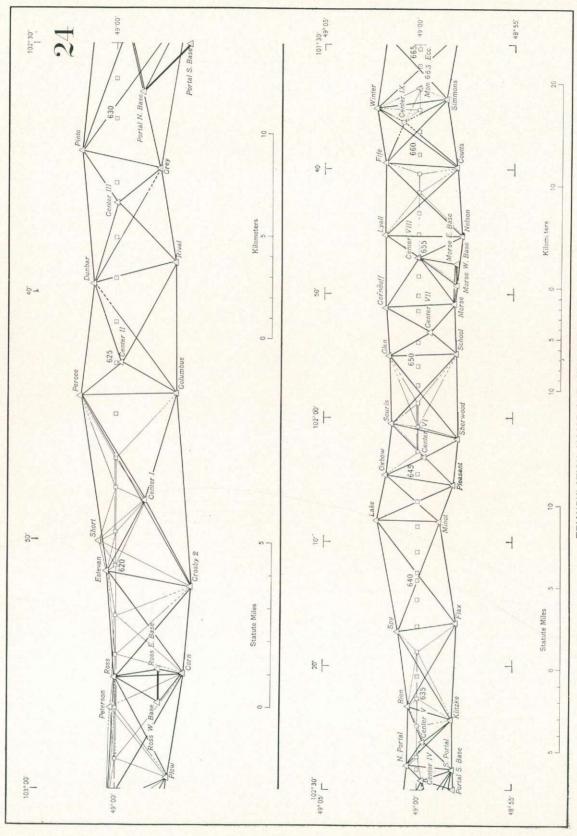
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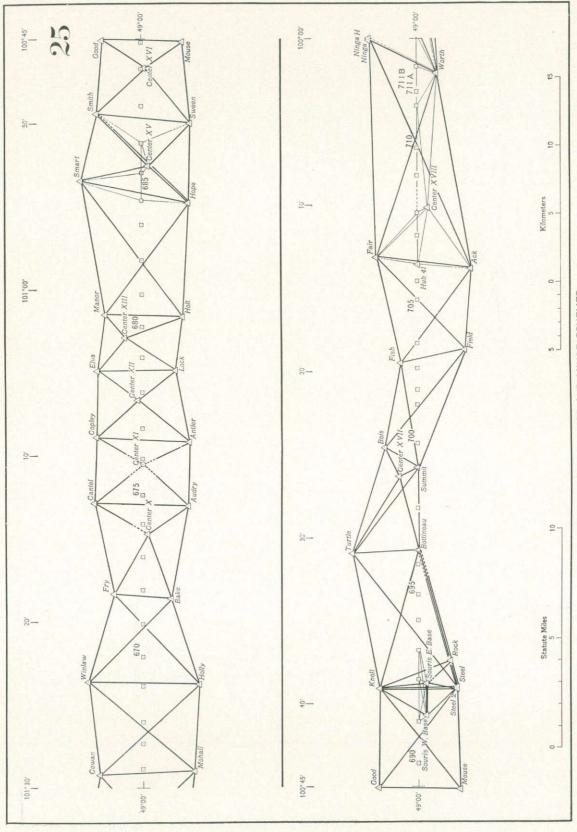
TRIANGULATION, MAJOR AND MINOR SCHEMES



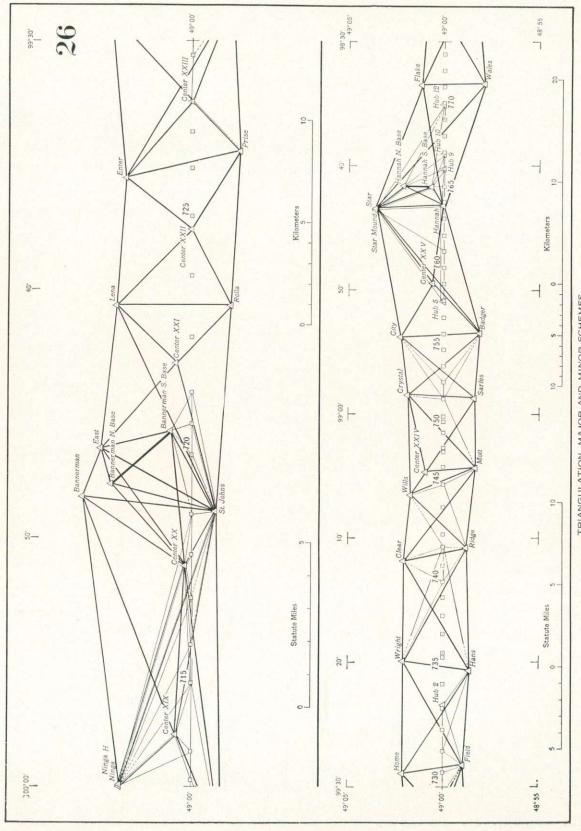
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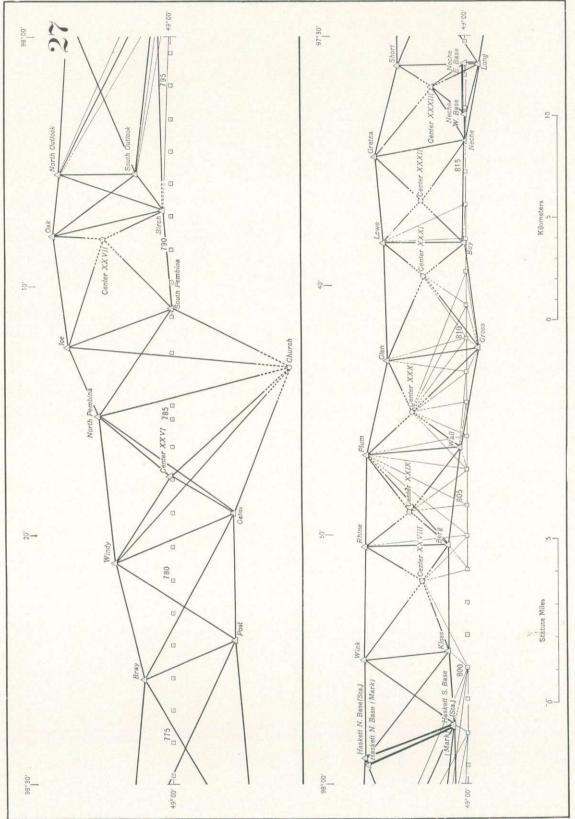
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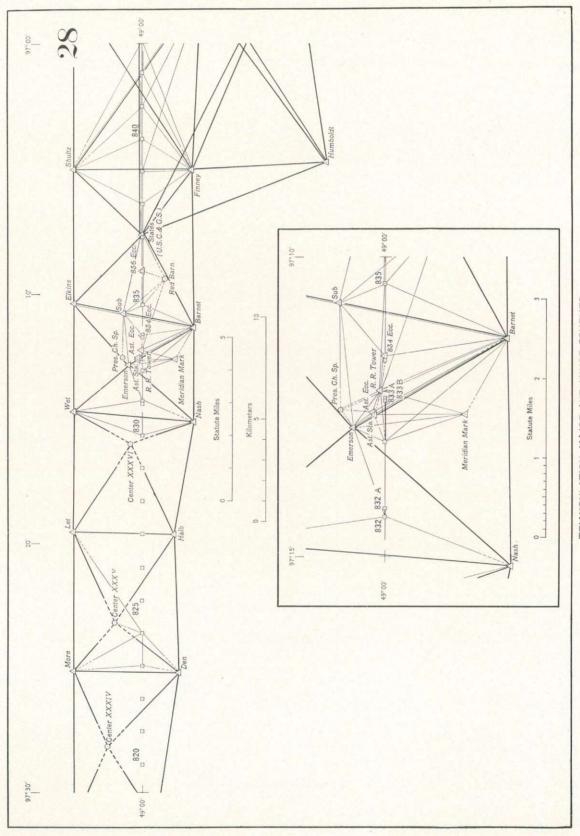
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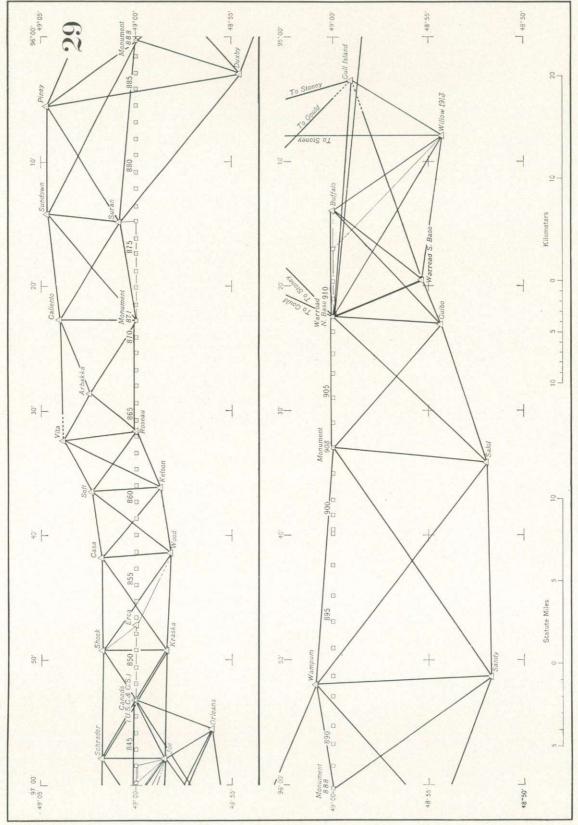
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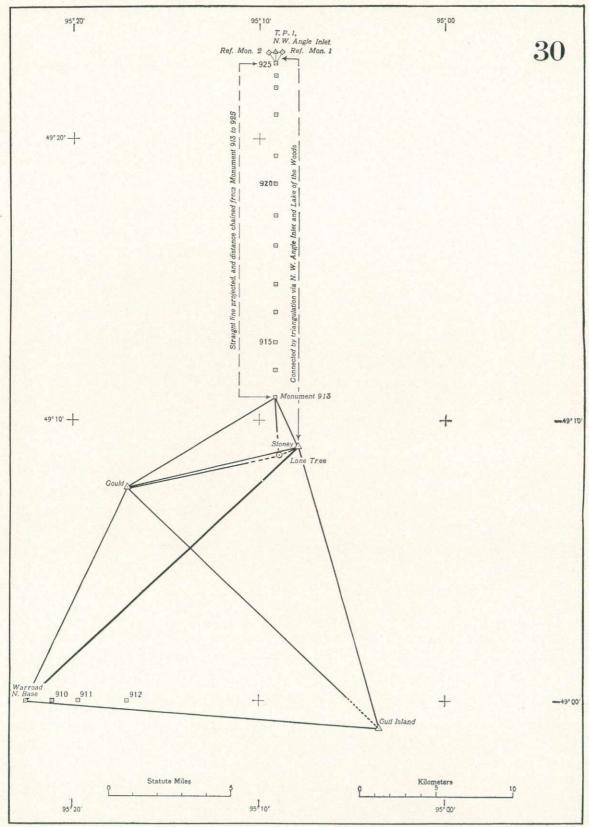
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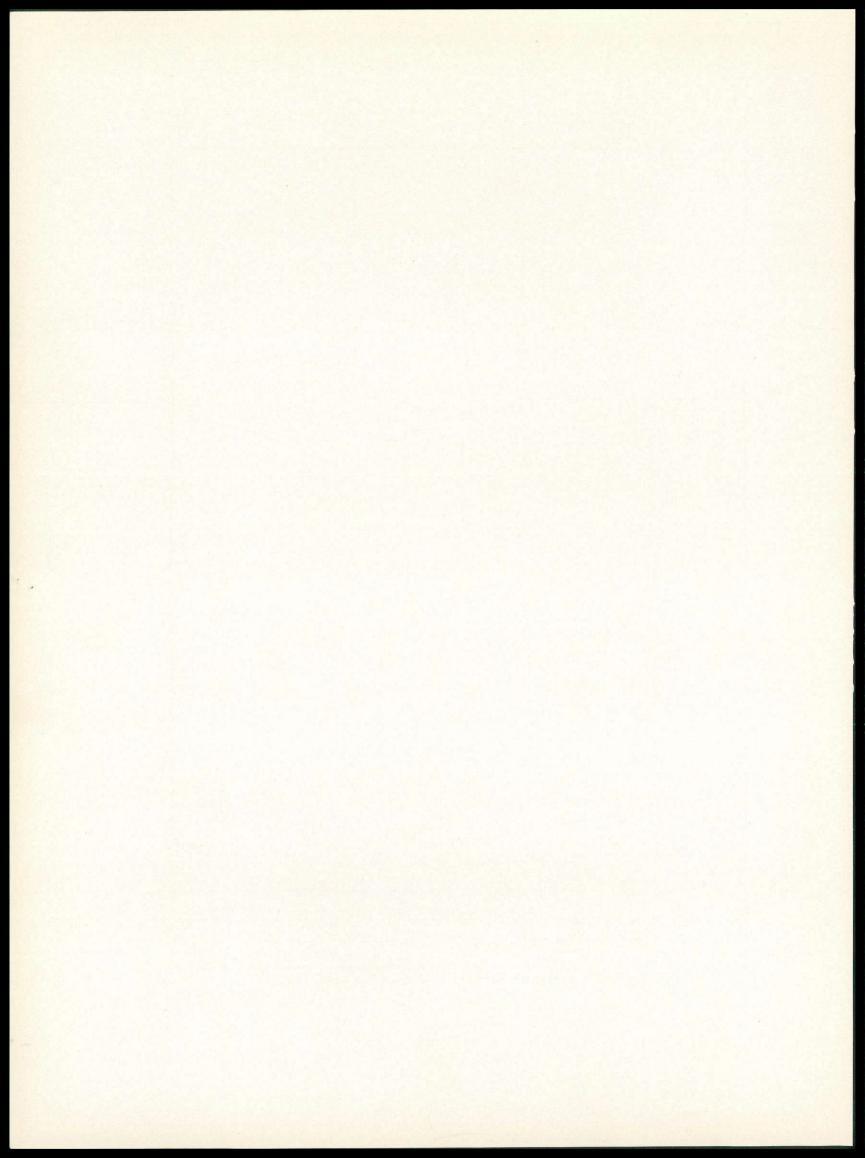
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ead	261	360	437	Sarles (G. S. of C.)	260	357	4
ecord	275	382	442	Sarles school	270	376	4
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