

BOUNDARY OF CANADA AND THE UNITED STATES

FIELD WORK OF LINE IS PRACTICALLY COMPLETED

First Stage of Immense Task is Well Advanced and Thousands of Boundary Marks Have Been Placed by Surveys.

The progress made in the work of locating the 4,150 miles of the International Boundary Line, jointly under the direction of one United States and one British Commissioner, by American and Canadian survey parties, is shown in the following summary of the work of the International Boundary Commissions issued by the Department of the Interior.

It will be seen from the summary that the field work of the undertaking is practically completed and that there remains to be done only the erections of certain range marks, the setting of certain monuments, and other work. The difficulties that had to be overcome in the field, and the extent of the topographical surveys for the purpose of complying with the requirements of the treaty as to mapping, etc., and of the other necessary work, are indicated in the summary.

As shown, the boundary line begins at the Arctic ocean and runs 1,500 miles south. It commences again at the Straits of Fuca, and thence 3,900 miles from the Pacific to the Atlantic coast, 2,280 miles of which are water. The summary is as follows:—

Authorization:

Alaskan Coast Boundary; Convention of 1903.

Boundary from the Arctic ocean to Mount St. Elias; Convention of 1906.

Atlantic to Pacific ocean; Treaty of 1908, Articles I to III and V to VIII.

Requirements of Treaties or Conventions.

1. That the land boundary shall be marked by durable monuments at frequent intervals; that the water boundary shall be referenced by durable monuments on the shore at frequent intervals.

2. That the boundary line shall be drawn by the Commissioners on accurate, modern maps.

3. That a joint report describing the boundary line, monuments, and operations shall be submitted at the close of the work.

"As there were no maps of sufficient accuracy in existence for the laying down of the boundary line, it was necessary to make them, which involved extending a belt of triangulation along the boundary line for determining the geographic positions of the monuments and controlling the topographic work; running of levels for the determination of elevations; and accurately mapping a belt extending from one-half to two miles on either side of the boundary line for its entire length. And it was also necessary in places to make soundings in the water areas traversed by the boundary line.

LENGTH OF BOUNDARY LINE.

"The boundary line between the United States and Canada starts at the Arctic ocean and runs due south 645 miles to Mount St. Elias, then parallels the coast a short distance inland and through the Portland canal for a distance of 862 miles; and beginning again at the entrance of the Straits of Fuca extends 3,900 miles across the continent to the mouth of the Passamaquoddy bay on the Atlantic shore. Of the 1,500 miles of the Alaskan boundary, 180 miles are water; and of the

3,900 miles from the Pacific to the Atlantic ocean, 2,100 miles are water. The portion of the boundary through the St. Lawrence river and the Great Lakes, 1,250 miles in length, was located by the International Joint Commission under Article IV of the Treaty of 1908 during 1908 to 1914. Therefore, the present International Boundary Commissions were charged with the location of 4,150 miles of the boundary line.

CONDITION OF WORK JAN. 1, 1919.

"The field work of the location of the 4,150 miles of boundary, the location of which was entrusted to these commissions, namely, from the Arctic ocean to Mount St. Elias and thence to Cape Muzon, and from the Pacific to the Atlantic ocean excepting through the Great Lakes and the St. Lawrence river, is practically completed, there remaining to be done during the coming field season only:—

"The erection of some range marks in Passamaquoddy bay;

"The setting of some monuments for a short distance on the St. Croix river;

"The examination of part of the located boundary line east of the summit of the Rocky Mountains by United States parties;

"And the survey of 16 miles of boundary line along the Maine Highlands by Canadian parties.

"The work has been done jointly under the direction of one United States and one British commissioner by United States and Canadian survey parties, and one-half of the expense has been borne by each Government.

"On the land portion of the boundary 2,550 metal monuments from three to five feet high, set in concrete foundations, at intervals of from one-half to three miles apart, have been erected, and vista cut along the line; 1,647 metal or concrete marks have been erected on the shores to reference the water boundary, and 3,000 tile marks have been set along the Maine Highlands between the large monuments. A total of 7,215 boundary marks have been set on the 4,150 miles of boundary line located, all of which were set in concrete foundations or in solid rock.

"The geographic positions; that is, the latitude and longitude of each of these marks have been accurately determined and the positions of 8,000 triangulation stations have been marked and determined. Approximately 2,000 miles of levels have been run for the determination of the elevations of the marks and the control of the topography, and accurate topographic maps of the belt of country extending from one-half to two miles on either side of the boundary line have been made; that is, 5,000 square miles of territory have been mapped on each side of the boundary.

"Although the field work of the commissions is practically completed, there necessarily remains much office work to be done in the computation of the triangulation and the preparation of the boundary maps and reports required by the treaty. Before the maps can be published the final computation of the triangulation must be made. Up to the present time the final positions of 3,500 points have been computed and there yet remain to be computed the geographic positions of approximately 9,000 points; in addition to which the geographic positions of 1,500 turning points in the water boundary must be computed.

MATERIALS AND TRANSPORTATION.

"The monuments, reference marks, tile, and cement for the monument foundations weighed 700 tons, all of which had

to be transported in the field from the nearest railroad station or boat landing from 1 to 300 miles to the monument sites, by canoes, wagons, or pack-trains, and occasionally part of the distance by men. Three thousand tons of sand also had to be transported from 1 to 10 miles for use in the construction of the monument foundations.

"In addition to the above, the instruments, camp equipment, food for members of the parties, and feed for the animals had also to be transported long distances.

"As the treaty requires that the boundary line shall be drawn on accurate, modern maps, it will require 295 maps, approximately 24 inches by 36 inches each, for the laying down of the boundary line. Of these maps, 60 sheets have been prepared, engraved, printed and signed; 20 others have been engraved; 190 are ready for engraving as soon as the triangulation is finally computed; and 25 others are yet to be drawn.

REPORTS ARE VALUABLE.

"Of the seven joint reports required by the treaties or conventions, one report, that of the establishment of the boundary line from the Arctic ocean to Mount St. Elias, is now in press, and considerable work has been done on the preparation of the remaining six.

"The maps and reports of the commissions will be of great value to other bureaus of the Government, as they furnish a belt of accurate topography extending along the whole boundary line between the United States and Canada, which will furnish a base for the extension of additional surveys. The triangulation executed will furnish a base for the extension of triangulation in the future, and the elevations of the bench marks for the extension of future levels. This information is already being made use of, and advance information is frequently called for and furnished to other branches of the Government.

"To complete the work required by the treaties and conventions, that is the final computation of the triangulation, the preparation and printing of the reports, the preparation, engraving, and printing of the maps, will probably take from five to seven years."

Public Works Expenditure.

As shown by the report of the Minister of Public Works for the year ended March 31, 1917, the appropriations granted by Parliament to the Department in the year war was declared, amounted to \$47,154,196.60. The Parliamentary grant was reduced in 1915-16 to \$34,599,183.99; in 1916-17, to \$30,823,281.99, and in 1917-18, to \$20,822,663.75, or considerably less than one-half the sum voted only three years before.

Cost of Dredging.

The Department of Public Works expended during the fiscal year 1917 for dredging \$2,410,413.24, a decrease of \$1,465,300.97 from the expenditure of the preceding year for dredging, according to the report of the Minister of Public Works for the year ended March 31, 1917.

ANNUAL REPORT ON WORK OF GEODETIC SURVEY IS ISSUED

Amount of Precise Levelling by Provinces is Shown with Ontario in the Lead and Quebec Second.

USEFUL TOPOGRAPHICAL DATA

The annual report of the Superintendent of the Geodetic Survey of Canada for the fiscal year ending March 31, 1918, which has recently been issued by the Department of the Interior, shows that the number of miles of precise levelling since the inception of the work in 1906 up to and including the 1917 operations is distributed among the provinces as follows:—

	Miles.
Ontario.....	3,282
Quebec.....	1,437
British Columbia.....	1,385
Alberta.....	1,185
Saskatchewan.....	928
New Brunswick.....	864
Nova Scotia.....	705
Manitoba.....	684
Minnesota.....	89

This amounts to a mileage of 10,559, and is exclusive of 491 miles of precise levelling in the Yukon in connection with the International Boundary surveys.

The total number of standard benchmarks established since the beginning of the survey is 3,041, which number does not include those bench-marks of other organizations whose elevations have been determined by the Geodetic Survey, as shown in the report.

Very important topographic work carried on by the survey, observations and reconnaissance surveys carried on with a view to extending the triangulation system, base lines measured, and other work of great commercial and economic value is reviewed in the report. It is explained that the Geodetic Survey of Canada is the outcome of a realization of the necessity and economic value of a geodetic survey in laying the foundations for topographic and hydrographic surveys and to co-ordinate the results of older surveys, and also for obtaining the geographical position of points scattered over the country, together with its coast-lines and large waterways. Such a survey, it is stated, is the foundation of the work of producing accurate maps of the country.

Maple Trees Yield.

A matured maple tree releases about twelve gallons of sap, 3 per cent of which is sugar. The average tree will yield over 60 cents in sugar or syrup, and will continue to do so for 125 years.

—Canada Food Board.

Back the W.S.S. campaign.

SHOWS FOODSTUFF WHICH CANADA SENT TO EUROPE

The following table of exports from Canada for three typical periods, one pre-war and two war periods, show how the value of exports increased. They are taken from the report of the Canada Food Board.

Article.	1913.	1916.	9 months, April-Dec., 1918.
Butter.....	\$ 828,323	\$ 3,441,183	\$ 9,844,721
Cheese.....	155,216,392	168,961,583	148,732,418
Lard.....	46,638	24,998	136,727
Bacon.....	36,212,190	144,918,867	64,402,615
Beef.....	1,570,979	47,422,564	103,411,057
Canned meats.....	254,937	11,031,893	8,108,129
Ham.....	2,476,654	8,732,857	1,792,548
Pork.....	521,533	13,142,196	35,408,276
Milk and cream (canned, etc.) ..	335,849	13,247,834	42,476,726