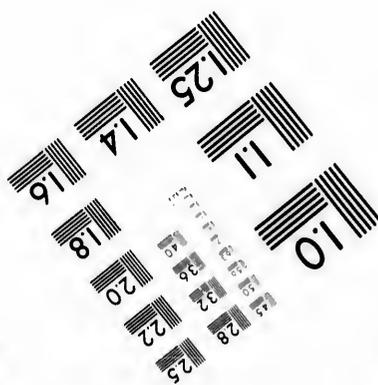
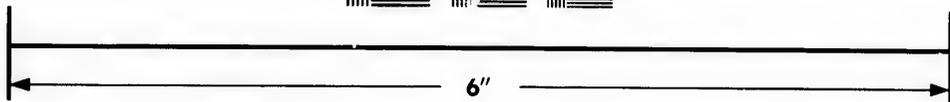
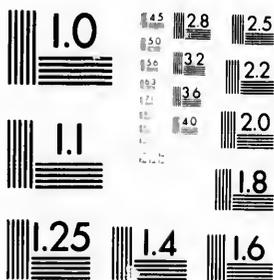


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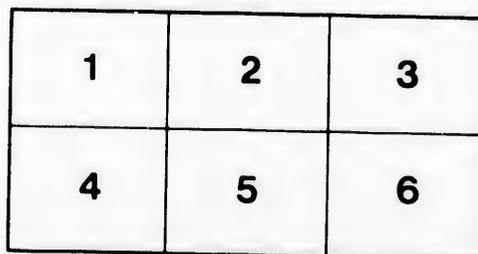
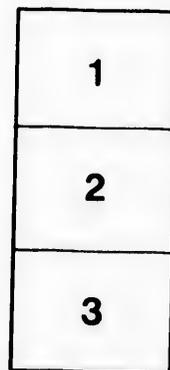
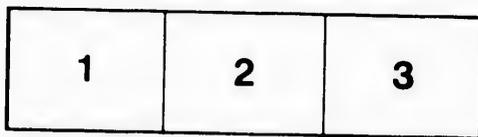
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Arthur Markin

JOINT REPORT

OF THE

UNITED STATES AND BRITISH COMMISSIONERS

ON THE

ALASKAN-CANADIAN BOUNDARY.

DECEMBER 31, 1895.

**WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1898.**

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ALASKAN-CANADIAN BOUNDARY.

The undersigned, William Ward Duffield, on behalf of the United States of America, and William Frederick King, on behalf of Her Britannic Majesty, duly appointed Commissioners under and by virtue of the first article of the Convention of July 22, 1892, between the United States and the United Kingdom of Great Britain and Ireland, have the honor to submit the following joint report of our proceedings and transactions under the said first article of the Convention, which reads as follows:

The High Contracting Parties agree that a coincident or joint survey (as may be found in practice most convenient) shall be made of the territory adjacent to that part of the boundary line of the United States of America and the Dominion of Canada dividing the territory of Alaska from the Province of British Columbia and the Northwest Territory of Canada from the latitude of $54^{\circ} 40'$ North, to the point where the said boundary line encounters the 141st degree of longitude westward from the meridian of Greenwich, by Commissioners to be appointed severally by the High Contracting Parties, with a view to the ascertainment of the facts and data necessary to the permanent delimitation of said boundary line, in accordance with the spirit and intent of the existing treaties in regard to it between Great Britain and Russia and between the United States and Russia.

Application will be made without delay to the respec-

tive legislative bodies for the appropriations necessary for the prosecution of the survey, and the Commissioners to be appointed by the two Governments shall meet at Ottawa within two months after said appropriation shall have been made and shall proceed as soon as practicable thereafter to the active discharge of their duties.

The respective Commissions shall complete the survey and submit their final reports thereof within two years from their first meeting.

The Commissioners shall, so far as they may be able to agree, make a joint report to each of the two Governments, and they shall also report either jointly or severally, to each Government on any points upon which they may be unable to agree.

Each Government shall pay the expenses of the Commission appointed by it.

Each Government engages to facilitate in every possible way any operations which, in pursuance of the plan to be agreed upon by the Commissioners, may be conducted within its territory by the Commission of the other.

The High Contracting Parties agree that, as soon as practicable after the report, or reports, of the Commissioners shall have been received, they will proceed to consider and establish the boundary line in question.

The first meeting of the Commissioners appointed under this article was held in Ottawa on the 28th day of November, 1892. By the supplementary Convention of the 3d February, 1894, the time for the completion of the work and the submission by the Commissioners of their joint or separate reports, which, by the former convention expired two years from the date of the first meeting of the Commissioners—that is to say, on the 28th November, 1894, was extended to the 31st December, 1895.

The treaties relating to and defining the international boundary line between Canada and the United States of America in the region in question are the treaty between Great Britain and Russia, dated 28-16 February, 1825, and the treaty between the United States and Russia dated 30th March, 1867.

Our Commission, under said Article 1 of the Convention of 1892, applies only to that portion of the boundary described in these treaties from the southernmost point of Prince of Wales Island to the one hundred and forty-first meridian.

With a view to the performance of the duty imposed upon the Commissioners under the Convention of ascertaining the facts and data necessary to the permanent delimitation of the boundary line, and under the option allowed them of making either a coincident or joint survey, Dr. Thomas C. Mendenhall, at the time Commissioner for the United States (since replaced by the undersigned, William Ward Duffield), together with the undersigned British Commissioner, having considered the large extent of unknown territory involved and the comparatively short time allowed for the survey, determined that it was advisable to make the survey a joint one; that is, to partition among the officers working under them respectively the territory to be surveyed, arranging at the same time that each Commissioner should detail attachés to accompany the several surveying parties of the other, for the purpose of observing and verifying their work.

The United States Commissioner undertook to make surveys of as precise a nature as practicable of

the principal water courses which traverse the coast strip, and the British Commissioner undertook to make a photo-topographical survey of the mountainous regions lying between these various water courses.

A preliminary trigonometrical survey of the principal deep-water passages, including the continental shore line from Portland Canal to Lynn Canal, had already been completed by the United States Coast and Geodetic Survey; and careful determinations of the geographical positions of Mount St. Elias (as hereinafter given) and of various mountain peaks in that region were made by the same organization in 1892, at which time a partial survey of the shore line of Yakutat Bay was also made. This completed work helped to coordinate the detached surveys of the various parties sent out by the two Commissioners.

In pursuance of this plan, during the year 1893, the following gentlemen were given parties on behalf of the United States, namely:

Mr. Dickins, on the Unuk River.

Mr. Tittmann, on the Stikine River.

Mr. McGrath, on the Taku Inlet.

Mr. Ogden, on the Taku River.

Their duties were to make surveys of these water ways, and to procure as much information as possible as to the topography of the adjacent regions. Mr. Driscoll accompanied Mr. Ogden as attaché appointed by the British Commissioner, and Mr. Robertson accompanied Mr. Tittmann in a like capacity. Mr. Dickins' survey of the Unuk River was made in conjunction with Mr. Saint-Cyr, of

the British Commission, who, besides making a traverse of the Unuk River, paid particular attention to the mountainous regions on either side of the river.

On behalf of the British Commission, the following gentlemen were placed under instructions to make topographical surveys as full and complete as their means would allow:

Mr. Saint-Cyr, the Unuk River and the mountainous region on either side of it.

Mr. Klotz, adjoining him to the west and northwest towards Bradfield Canal.

Mr. Talbot, to the south and east of the Stikine.

Mr. Gibbons, to the west of the Stikine.

Mr. Brabazon, at Holkham Bay, on the east side of Stephen's Passage.

Mr. McArthur, at Snettisham Bay, and thence to Taku Inlet and Taku River.

Mr. Ogilvie, to the north and west of Taku Inlet and east of Lynn Canal.

The attachés of the United States Commissioner accompanying them were as follows:

Mr. Flemer with Mr. Talbot.

Mr. Pratt with Mr. Gibbons.

Mr. Ritter with Mr. Brabazon.

Mr. Welker with Mr. McArthur.

Mr. Hodgkins with Mr. Ogilvie.

Mr. Dickins working with Mr. Saint-Cyr as above stated.

In addition to the above, the United States Commissioner stationed Mr. Morse at Sitka to make astronomical observations for the determination of chronometric differences of longitude between Sitka,

as a base station, and the observatories established by Mr. Dickins at Burroughs Bay, with Dr. Edmonds as observer; by Mr. Tittmann at Fort Wrangell, with Mr. Putnam as observer; and by Mr. Ogden at the mouth of the Taku River, with Mr. French as observer. At each of the above stations latitude and longitude were also determined. The United States steamer *Hassler* was employed throughout the season in making the necessary exchanges of time, the chronometers being in charge of Mr. Lord.

The parties were on the ground and the work begun in the middle of May; and the early snow falls rendering mountain work impossible, it was found necessary to retire from the field in September.

During the following year, 1894, the following parties were placed in the field:

On behalf of the United States Commission—

Mr. Pratt, on the Chilkat Inlet and River and on Chilkoot and Taiya Inlets and Taiya River, he being engaged chiefly in triangulation.

Mr. Dickins, on Unuk River and Chilkat Inlet.

Mr. Flemer, on Chilkoot and Taiya Inlets.

Mr. Ritter, on Chilkat Inlet and River.

Mr. McGrath, on the coast westward from Yakutat Bay and at Lituya Bay.

Mr. Morse, at the Sitka longitude station.

Latitude and longitude were determined at the observatory at Anchorage Point, Pyramid Harbor, the steamer *Hassler* making the necessary chronometer trips as before.

Mr. Hayford made the observations at Pyramid Harbor, and Mr. Page had charge of the chronometers on the *Hassler*.

On behalf of the British Commission—

Mr. Saint-Cyr, at the head of the Portland Canal and thence to the Chickamin River.

Mr. Klotz, around Bradfield Canal.

Mr. Gibbons, on the north of Frederick Sound from Horn Cliffs to Port Houghton.

Mr. Ogilvie, on the east coast of Lynn Canal, also on the outer coast beyond Capé Spencer.

Mr. McArthur, at the north end of Lynn Canal and later on the outer coast at Lituya Bay.

Mr. Talbot, on the west side of Lynn Canal toward Glacier Bay.

Mr. Robertson accompanied Mr. Pratt's party as attaché for the British Commissioner. Except in this instance, the system of attachés was discontinued by mutual consent of the Commissioners.

During the winter of 1894-95, a party under Mr. Ogilvie ascended the Taku River for the purpose of gaining additional information as to the region extending thence to the vicinity of White and Taiya Passes, which lead from Lynn Canal to the interior; but, on account of tempestuous weather, the expedition was obliged to return, having accomplished nothing beyond a traverse survey of part of Taku River.

During the season of 1895, Mr. Brabazon was detailed by the British Commissioner to the region lying between the mouth of the Alsek River and Yakutat Bay.

Mr. Welker and Mr. Dickins were sent by the United States Commissioner to connect the surveys made in former years by the United States Coast and Geodetic Survey in Portland Canal with those

in Revillagigedo Channel, and to determine more accurately the longitude of the stations along the Canal.

Mr. Dickins and Mr. Welker were placed in charge of parties in Alaska, and Mr. Morse was stationed at Seattle as astronomer for the redetermination of the differences of longitude between that point and the observatories at Port Simpson, B. C., at Mary Island, Alaska, and at a station at the head of Portland Canal. The observations for latitude and longitude were made by Mr. French at Port Simpson, by Mr. Dickens at Mary Island, and by Mr. Welker at Lion Point, Portland Canal.

Mr. Young was in charge of the chronometers carried by the steamer *City of Topeka* between Seattle and the stations at Port Simpson and Mary Island.

Comparisons between Port Simpson and Lion Point were effected by the United States launch *Fuca*.

The results of all these surveys are exhibited in the accompanying maps, namely, sheets Nos. 1 to 24, made on a scale of $\frac{1}{160000}$ with contour lines of elevations 250 feet apart, from the surveys of the British Commission; and in maps Nos. 1 to 12 of the United States Commission, made on the same scale.

These maps have been agreed to by us, subject to the limitations hereinafter set forth, as correct representations of the topographical features, and have been signed by us to testify thereto. In submitting two sets of maps which cover the same ground and which, to a large extent, have been prepared inde-

pendently in the offices of the respective Commissioners at Washington and Ottawa, it is understood that wherever there is a difference between the maps, either from different methods of representing the topography or from discrepancy as to the position of natural features or otherwise, such difference is to be interpreted by reference to the hereinbefore-described scheme of partition of the survey work between the respective Commissions; and where the surveys cover the same, or nearly the same ground, the maps are to be taken as mutually explanatory, having regard to the conditions under which each survey was made. The continental shore line, from latitude $54^{\circ} 40'$, to Point Coverdon, at the southwesterly entrance to Lynn Canal, having been surveyed by the United States Coast and Geodetic Survey, the United States maps shall, in case of discrepancy, govern as to the shore line; so also from Yakutat Bay to the one hundred and forty-first meridian. But from Point Coverdon northwesterly to Yakutat Bay, including Glacier Bay and the other bays which, with the exception to the entrance to Lituya Bay, have not been so surveyed, the maps of the British Commission shall govern. The shore line of the islands of the Alaskan archipelago have been mapped according to the surveys of the United States Coast and Geodetic Survey, wherever such survey has been made; elsewhere the best information available has been used.

To show the topographical features of the country in another way, we herewith submit photographic views, being contact prints from the photographic negatives of the officers of the British

Commission, whose work was largely executed as to the detail, or "filling in" by means of these views, according to the method known as photo-topography, the framework being laid out by triangulations which are shown in sheets Nos. 25, 26, 27, and 28 of the British Commission. These views will also serve as a permanent record of the field work. Plans of the triangulation executed by the officers of the United States Commission are submitted herewith on sheet No. 13 of the United States Commission.

Besides the information contained in the maps, we have to report as to the point of commencement named in the Treaty of 1825, that the latitudes of Capes Muzon and Chacon as determined by the British observers are as follows:

Cape Muzon, $54^{\circ} 39' 50''$.

Cape Chacon, $54^{\circ} 41' 25''$.

As determined by the United States observers these latitudes are:

Cape Muzon, $54^{\circ} 39' 48''$.

Cape Chacon, $54^{\circ} 41' 22''$.

These results are so nearly alike that there is no practical discrepancy between them.

Also, the summit of Mount St. Elias is by the best determination in latitude $60^{\circ} 17' 35.10''$ and longitude $140^{\circ} 55' 47.32''$, being 28.830 nautical miles from the line of coast west of Yakutat Bay and 2.41 statute miles east of the one hundred and forty-first meridian.

We conceive it unnecessary for us, having prepared maps showing so much detail, to enter into a lengthy description of the topography. It may be well, however, to add some remarks upon the mode

of occurrence of timber, since this is not shown on the maps.

Speaking broadly, we may say that the average altitude of the timber line between Burrough's Bay and Lynn Canal is 2,500 feet, being a little higher in the south and a little lower in the north. Timber line is primarily a matter of heat, so that altitude and latitude have similar effect. However, in a country of which so much has but recently been uncovered from glaciers, timber line is affected by another factor, and that is the presence of soil for trees to take root. As the foot of a mountain is first exposed, the forest starts there and in time, as exposure and consequent disintegration take place, creeps upward. Now, there are many points in the area above referred to where this process of forest creeping has not yet reached the limit set by climatic conditions, and hence we find timber lines near each other, but varying in altitude by hundreds of feet. This is most noticeable on the west side of Lynn Canal. Naturally, we would expect the timber line in the south to be higher than in the north; but, as a matter of fact, it is the reverse there, being scarcely 2,000 feet for the former and nearly 3,000 feet for the latter. In general, the timber line on the east side of Lynn Canal is somewhat higher than on the west side. Around Juneau, the timber line does not reach the 2,000 feet limit. Between the entrance of Glacier Bay, across Dundas and Taylor Bays and Cape Spencer, the timber line may be put at 2,000 feet above the sea. In Glacier Bay, northward from the entrance, the timber line rapidly descends, and in the northern part the forest practically disappears

altogether. In fact, along many of the smaller bays there, no wood whatever is found. This phenomenon is plainly indicative of the recent recession of the vast complex of glaciers. On the outside, between Lituya Bay and Cape Spencer, the line is barely 2,000 feet, while in Yakutat Bay it is 1,500 feet. Most of the mountains between Yakutat Bay and Lituya Bay are not timbered at all; but this is probably due—up to 2,000 feet—to the fact already stated, *i. e.*, that the recession of the glaciers is too recent to admit of the necessary disintegration for vegetation to spring up, as well as to the effect upon the temperature of the nearness of the existing glaciers.

The altitude of the timber line at various points is as follows:

	Maximum.	Average.
Portland Canal	2,600	2,500
Unuk River.....	2,900	2,600
Burrough's Bay.....	2,800	2,500
Bradfield's Canal.....	2,700	2,500
South of Stikine.....	2,700	2,500
North of Stikine.....		2,500
Thomas Bay.....		2,500
Endicott Arm.....	2,500	2,300
Snettisham Bay.....	2,700	2,400
Taku Inlet.....		2,200
East side Lynn Canal.....	2,900	2,500
Head of Lynn Canal.....	3,000	2,500
West side of Lynn Canal.....	2,400	2,000
Outside, west of Cape Spencer	1,500

It is understood and agreed that in signing this joint report and signing and accepting the maps they have submitted, it is not therefore affirmed or

admitted by the Commissioners that there is authority for the application of the names used to designate the various places, mountains, bays, channels, islands, etc.

In witness whereof we have hereunto set our hands at Albany, New York, this 31st day of December, 1895.

W. W. DUFFIELD,
United States Commissioner.

W. F. KING,
Her Majesty's Commissioner.

