THE ASCENT OF MT. LOGAN 1925

19,850 Feet Above the Sea.

Being an account of the activities of expeditions under the auspices of the Alpine Club of Canada - to which two branches of the Federal Government, the Geodetic Survey of Canada, and the Department of Mines, gave assistance - to climb the highest mountain in the Dominion, which is situated in the extreme south west corner of the Yukon Territory.

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LETTER OF TRANSMITTAL

Noel J. Ogilvie, Esq.,
Director, Geodetic Survey of Canada,
Department of the Interior,
Ottawa.

Sir:

Herewith I beg to submit a report of the organization, narrative and work of the Expedition, formed to undertake exclusively the ascent of Mt. Logan in the Yukon Territory.

Although it was a matter of regret that no arrangements were found possible to equip the Expedition with means to extend portions of the topography of the region - of which much still remains unexplored - it is still some solace to feel, that had it not been for the undivided purpose of the Expedition, it is doubtful whether it would have been successful - the magnitude of the task, admittedly being underestimated.

Apart from the mere accomplishment of a difficult task, and the prestige our own country might derive therefrom, we have at least, to the Expedition's credit the meterological observations, our greater knowledge of the country and the wealth of the records in story and photograph.

The part played by the government is largely due to the favourable response given by the Deputy Minister, to the request received from the Director of the Alpine Club in 1923 which, after

being reported on by the Parks Branch, gained some interest with the late Director of Surveys, and eventually materialized in the Department giving aid to the extent of releasing myself for the work and paying expenses.

The Department of Mines sent H. M. Laing of B.C. as biologist and motion picture operator, supplying expenses and 4000 feet of film.

The records of the behaviour of a specially constructed aneroid (Appendix 11) supplied by this Branch and investigated by the Physical Laboratory of the Department of the Interior, I trust, will be of interest.

Of the personnel, five were citizens of the United States, while three were Canadians, Mr. Hall and Morgan falling out, the nationalities on the summit were equally divided.

I am,

Sir,

Your obedient servant.

A.P. Lambart

PREFACE

Although the Alpine Club of Canada is bringing out a special Journal dealing with the Logan Expedition exclusively, and articles are appearing in the publications of the Royal Geographical Society, the National Geographic Society and the Swiss Alpine Journal (French translation), besides what is coming out in print on the other side of the line, it is felt that none of these reach beyond the story or narrative form, and the justification of this final report as a Departmental Publication must rest with the fact that herein has been brought together the details of organization and equipment, narrative, and results of the work of the expedition - in as condensed form as possible - which otherwise would in time become scattered and lose value as a reference.

Mt. Logan, the crowning peak of the Mt. St. Elias cordillera, in the extreme south west corner of the Yukon Territory is the highest mountain of the British Empire, with the exception of the giant peaks of the Himilayas. Of striking character and rising from snow fields 12,000 square miles in extent, the massif is probably the greatest on the globe but which yet remained unknown until 1890 (when I. C. Russell of the U. S. Geological Survey saw it from the foothills), and only first photographed in 1897. A mountain with such eminent physical characteristics remaining in obscurity for so long is in itself an indication of the immensity of its surroundings. It is no wonder, then,

that after the publication of the International Boundary Topographical sheets, as a result of the field work of 1913, when the 141st Meridian finally pierced the range a distance of 21 miles to the west of the Logan massif, that alpinists the world over became attracted by this new virgin field. It is, therefore, with feelings of pride that we find our own Canadian Alpine Club under its veteran and distinguished Director, A. O. Wheeler, accepting the responsibility thus placed upon it of fostering and organizing the first and only expedition launched to scale its summit. Prof. A. P. Coleman of Toronto University first gave expression to this responsibility in 1921, which later received more special consideration at the Club's summer annual camp in 1922 and 1923.

The first special meeting of the Mt. Logan Committee to consider the project was called in November 1923, when the leaders were elected, and the first steps taken to interest the members of the Club in giving financial support. Due to the lack of this support, the Expedition failed in taking the field in 1924 and was, very fortunately, postponed to the next year. The programme gradually worked itself out under three special headings: 1st. The reconnaissance, which was carried out during June and July in 1924; 2nd. The Winter freighting during February, March & April 1925; and thirdly and finally the records of the Climbing Party, which reached the summit on June 23rd, 1925.

Without the support given by two branches of the Federal

Government, namely the Geodetic Surveys and the Department of Mines and sister clubs, notably the American Alpine Club, The Alpine Club (England), the Royal Geographical Society and that of many private subscribers, besides the Canadian Pacific Railway and the Canadian National Railway, the project could not have been launched.

The Alpine Club of Canada having a membership representative of many countries, the Expedition necessarily became international in character, and it must be admitted that without the assistance so generously given by sister organizations on the other side of the line, it is doubtful whether the enterprize, on so short a notice, could have been carried out.

Mt. Logan does not present any special mountaineering difficulties of a technical kind, the chief problems being that of transportation, (the summit being 156 miles from the railway), and the living conditions for such a long period (26 days, June 3rd to 28th), upon the massif itself, enduring the effects of the rarefied air, extreme cold (min. 33° zero) blizzards and fog.

Compared with the problem faced by the Stuck-Karstens expeditions on Mt. Denali (Mt. McKinley, 20,310 ft.) Logan had less of the fatiguing cutting of ice steps as recorded in a long traverse of a dangerous arete, but on the otherhand Logan appears to have a much greater precipitation , with more fog and much colder, no signs of any kind being evident of the snow melting on the brightest of days, when the sun was at its highest (around June 21st.).

MT. LOGAN EXPEDITION 1925

FORMATION OF COMMITTEES. PERSONELL OF EXECUTIVE. MT. LOGAN COMMITTEE. APPOINTED NOV. 14. 1923

At the Annual Meeting of the Club at Larch Valley, 1923, the following were created a Committee to take action in connection with an expedition to Mt. Logan:-

A. O. Wheeler,

Col. W. W. Foster,

H. F. Lambart,

F. C. Bell,

A. A. McCarthy,

the Committee to have power to add to its members.

The Alpine Club (England) and the American Alpine Club, were invited to send members.

ADVISORY COMMITTEE

Professor A.P. Coleman F.R.S. Ph.D. University of Toronto

J.D. Patterson, Woodstock, Ontario, Canada,

Prof. Chas. E. Fay, Litt. D. Tufts College, Mass. U.S.A.

Walter D. Wilcox, F.R.G.S., Washington D.C. U.S.A.

Benj. J.P. Farrar, D.S.O. London, England

A.L. Mumm, F.R.G.S. London, England

Dr. J.W.A. Hickson, as ex-officio member, newly elected president of the Alpine Club of Canada in 1924.

TECHNICAL ADVISORS.

Mjr. E.O.Wheeler M.C. R.E.Surveys of India (first Mt. Everest expedition).

Belmore Browne Banff Alta. (First McKinley Expedition)
(Parker-Browne McKinley Expedition)

MT. LOGAN EXPEDITION

Climbing Party

Leader	A. H. McCarthy	Wilmer, B.C.
Vice-leader	H. F. Lambart	Ottawa
Official Recorder	Lt. Col. W.W. Foster D.S.O.	Vancouver, B.C.
A. A. C. Representative	Allen Carpe	New York, U.S.A.
Trail Guide	A. M. Taylor	Ottawa
#	R. M. Morgan	Dartmouth, U.S.A.
	N. H. Read	New York, U.S.A.
#	H. S. Hall, Jr.	Boston, U.S.A.

Two members of the party leaving June 21st, 1925.

INTERNATIONAL BOUNDARY (SOUTH EASTERN ALASKA SECTION) SURVEYS

TOPOGRAPHICAL SHEET NO. 13.

Scale 4 mi. - 1 inch

Showing relative positions of Logan, St. Elias and the coast line along the Malaspina Glacier and Yakutat Bay.

Summit of Mt. Logan.

King Peak just off edge.

CANADA

BRITISH COLUMBIA

ALASKA

UNITED STATES

PACIFIC OCEAN

Table Mt

COLUMBUS GLACIER

SEWARD GLACIER

Pyramid

MT HUXLEY

THE HUMP

GUYOT GLACIER (Not surveyed)

TYNDALL GLACIER

LIBBEY GLACIER

Haydon Pk

Russell Col

MT NEWTON

MT ST ELIAS

NEWTON GLACIER

AGASSIZ GLACIER

SAMOVAR HILLS

MT JEANETTE

MT BERING

MT BAIRD

MT MALASPINA

MT AUGUSTA

MT EATON

Corwin Cliffs

Crocodile Glacier

Dome Pass

MT OWEN

Ft Glorious

Camp Russell

Pinnacle Pass Hills

Pinnacle Gl.

Pinnacle Pass

Hitchcock Hills

MARINE GLACIER

MT COOK

MT VANCOUVER

MT ALVERSTONE

MT HUBBARD

HUBBARD GLACIER

Brabazon Glacier

MT SEATTLE

CHAIX HILLS

Castani L.

ICY BAY

COURSE OF RIVER UNDER GLACIER

Yahtse River

MALASPINA GLACIER

Yana Str.

Redwich Str.

SITKAGI BLUFFS

Pt Manby

Manby Str.

Osar Str.

Pomeroy Str.

Kane Str.

Hayden Glacier

FLORAL HILLS

Floral Pass

Terrace Pt

ATHETUDA GL.

Galiana Glacier

Baker Str.

Kwik Stream

LUCIA GLACIER

TURNER GLACIER

HANNEE GLACIER

Miller Glacier

DISENCHANTMENT BAY

Osier I

Haenke I.

Pt Latouche

Blizhui Pt

YAKUTAT BAY

RUSSELL FIORD

NUNATAK FIORD

VARIEGATED GL.

ORANGE GLACIER

MT JETTE

C. Enchantment

MT HENDRICKSON

MT DRAPER

MT HOOPER

MT UNANA

MT TEBENKOF

Knight I.

MT RUHAMAH

MT PINTA

HIDDEN GLACIER

BRABAZON RANGE

Black Tit

Crescent Mt

Slate Pk

Lake Redfield

Beasley Cr.

Moser Gl.

Moser Cr.

Krutoi I.

Otmeloi I.

Kriwoi I.

Dolgoi I.

Khantaak I.

Monti Bay

Yakutat

Ocean Cape

Cape Phipps Peninsula

YAKUTAT AND SOUTHERN R R

Lost Creek

Situk River

Miller Cr.

Seal Creek

Antlen River

Scale 1/250000

5 0 5 10 15 20 Miles

5 0 5 10 15 20 Kilometers

Contour interval 250 feet

HISTORY OF THE DISTRICT

BERING 1741. The earliest accounts we have are those of Vitus Bering and Alexei Cherikof in the St. Peter and St. Paul in 1741. Supposedly /the highest peak of the region, visible from the sea, was named Mt. St. Elias (July 20th) after the patron saint of the day.

COOK 1778 The next record we have is of Capt. James Cook, who, in May 1778, sailed by the entrance of Yakutat Bay.

PERUSE 1786 In June 1786 the French Navigator J. F. G. de la Peruse sailed eastward along the coast and was the first to actually enter Yakutat Bay. He mistook Dry Bay as that seen by Bering as Yakutat Bay. He was the first to discover and enter Latuya Bay as now known, calling it Port des Francais.

DIXON 1787 The English Captain George Dixon in May 23rd, 1787, explored the shores of Yakutat Bay and made the first survey ever made of the Bay.

DOUGLAS. 1788 One Capt. Douglas, who left little behind him, visited the coast in 1788.

MALASPINA 1791 An Italian in the service of Spain, Don Alejendro Malaspina, was ordered to sail north from Acapulco and visited the present site of Sitka on the 25th of June 1791. Two days later he sighted "Monte Buen-tiempo" - now known as Mt. Fairweather. Continuing north westward Malaspina entered Yakutat Bay and sailed on up the (Desengano Bay) Disenchantment Bay as far as Haenke Island (after D. Tadeo Haenke, naturalist of the Expedition), where he was blocked to

further progress by ice. His value for the elevation of St. Elias was 17,847.

VANCOUVER 1794 The voyages of Vancouver in 1794 in the Discovery and the Chatham added more to the knowledge of the geography of southern Alaska than any of the previous voyages. Puget in the Chatham anchored in Yakutat Bay, while the Discovery proceeded to Icy Bay.

BELCHER 1837 Forty three years later Sir Edward Belcher in His Majesty's ship "Sulphur" visited the coast in 1837. Reference is made of the veined marble effect of the sea ice in Icy Bay. An illustration was made of the outline of Mt. St. Elias more accurate in form than many subsequent ones, as seen from Icy Bay. The "Sulphur" anchored in Port Mulgrave, but no description of the country is given.

TOPHAM 1838 Topham visited the Coast in 1838 and records the interesting speculation that the highest portions of the system would lie north of Mt. St. Elias.

TEBENKOF 1852 Tebenkof compiled information gleemed from the voyages of Russian traders in 1852, reference being made to a map which showed the coast line from Lituya Bay to Icy Bay. The height of St. Elias was given as 17,000 feet and erroneous references are contained regarding its observed behaviour in 1839 - "began at times to smoke through a crater on its southeastern slope at the time of the earthquake at Sitka (1847) it is said to have emitted flames and ashes". Many other geographic features are mentioned.

U.S.COAST & GEODETIC SURVEYS, 1874 The Coast and Geodetic Survey in the year 1874

under W. H. Dall and M. Baker, carried on extensive surveys in the vicinity of Yakutat Bay and determined the elevation of many of the highest mountains along the coast, besides making observations of the geology and glaciers of the district. They gave the Malaspine glacier its name. Supplementing the results of this survey, as published in the Coast Survey Report of 1875, the "Pacific Coast Pilot " of 1883 in an exhaustive compilation gives all the historical and geographic information known up to that time.

WOODS 1877 Incentive now in this part of the world was centered in attempts to reach the summit of Mt. St. Elias. The first of these expeditions was that of C. E. S. Wood in 1877, who, through difficulties in getting passage along the coast, only got as far as Cape Spencer.

NEW YORK TIMES
EXPEDITION 1886 In command of Lieut. Frederick Schwatka, the New York Times sent an expedition in 1886 to Alaska for the purpose of climbing Mt. St. Elias. In July the expedition sailed from Sitka and reached Yakutat Bay in two days' time. Here the natives refusing to take the party to Icy Bay, where the journey northward was to commence, the U.S. Pinta carried them on and a safe landing was made. Journeying inland 16 miles, they reached a point at an elevation of 7200 feet on the foothills of the main range now known as Karr Hills. This expedition gave the names of Guyot, Agassiz, Tyndall Glaciers and Chaix Hills and Lake Castani (see the Century Magazine for April 1891 for Schwatka's narrative).

W. H. & E.
TOPHAM 1888 The second expedition with the prime object of climbing St. Elias was organized in 1888, personnel being W. H. and Edwin Topham of London, England, George Broka of Brussels and William

Williams of New York. By canoe on July 13th it reached Icy Bay and journeyed inland covering the country traversed by the first Times Expedition, and by their aneroid and boiling point measurements, reached an elevation of 11,460 feet. (See Scribners Magazine April 1889 and for illustration of St. Elias, the Alpine Journal, London, April 1889).

Although Logan rises 1,800 feet higher than anything in the district, it has so far escaped notice. We now come to Russell's explorations, and here, for the first time, have mentioned the existence of this massif, with little doubt the largest on the globe.

I.C. RUSSELL
1890 and 1891 Under the joint auspices of the National Geographic Society and the U.S. Geological Survey, supported by many private individuals, Mr. I. C. Russell set out to study geography, geology and glaciers of the Mt. St. Elias region. Mark B. Kerr, topographer, was assigned as assistant, the total party consisting of nine. Landing on the north shore of Yakutat Bay, the Russell party proceeded inland, skirting the eastern boundary of the Malaspina Glacier and reached finally a point on the Newton Glacier on the 22nd August, only a short distance below the foot of the Col at the head of the Valley, afterwards known as the Russell Col. The story that is told by Russell of the following six days alone in a wilderness of snow, in a terrific snowstorm is one that is seldom found in the records of mountaineering experiences. The expedition finally returned to Yakutat Bay, after 77 days, on September 15th. Though this expedition was timed a month too late, it is surprising to read what periods of good weather they had.

From the summit of the Pinnacle Pass Hills (elevation about 5,000 feet) I. C. Russell records the first sight of Logan.

The following year (1891) Russell again renewed his attempt on St. Elias and continued his glacial studies, landing this time near the mouth of Yahtse River on June 4th. The surf was running high and his first attempt resulted in a disaster in which 6 men were drowned. His northward journey now skirted the Chaix Hills and striking straight for the southwest corner of the Samovar Hills (July 12th) he re-ascended the Agassiz Glacier to the foot of the ice cascade, which terminates the Newton Glacier. On July 20th, at 8,000 feet, he reached the site of his old camp of the previous year, when he had been almost overcome with snow. Six weeks had been consumed in reaching this point from the coast and was now delayed here twelve days by bad weather. On August 24th an attempt was made to reach the summit, starting at two in the morning.

The steep ascent to the Col necessitated the constant cutting of ice steps, finally at noon the top of the Col was reached, and after a short rest, attacked the broad ridge, which heads to the summit. At four in the afternoon they had reached an altitude of 14,500 feet, with the summit far up above them and night coming on. The party was forced to return and finally reached their tents in an exhausted condition.

Russell's two expeditions contributed greatly to the knowledge of this hitherto little known region of the Mt. St. Elias Alps.

INTERNATIONAL BOUNDARY SURVEYS

First of the Southeastern Alaskan work

His Majesty's Boundary COMMISSION

In 1895 Dr. W. F. King, His Majestie's Boundary Commissioner, negotiated a loan of the Government Str. Quadra from the Marine Department to transport A. J. Brabazon's party to Yakutat Bay, for the purpose of making an exploration survey in connection with the Alaska Boundary in that region. They coasted along the shore, and the Malaspina Glacier for half a day, but did not attempt to enter Disenchantment Bay, as the entrance thereto was almost completely choked with icebergs.

A camp was made at Yakutat village (two stores and some Indian shacks) where a base line was measured, from which a triangulation survey was carried to the mouth of Disenchantment Bay. From this survey was located the positions of mountain peaks, which were afterwards climbed, and from which photographs were taken. A survey of Disenchantment Bay was then made, which is about 30 miles long, and as it is about 20 miles from the village to the mouth of the Bay, the survey extended for fifty miles on the water.

Mr. Brabazon proceeds to give an account of his work as follows: "I was on Osier Island one day taking photographs, when a monster mass of ice separated and tumbled from the Hubbard Glacier. Shortly afterwards I saw the water slowly recede from the island; it receded so far that we had plenty of time to run down and carry our canoes to the top of the island; when the water did return, it came in such a wave as to almost cover the island."

"After completing this survey, I surveyed the coast from Yakutat Bay to Dry Bay, a distance of 60 miles. Mt. St. Elias and Mr. Fairweather are visible from any points along this stretch, and as their positions were previously determined, the survey was controlled by observations on these peaks, and as the region is low for some miles inland from the shore, the mountains were photographed from suitable stations."

"I was equipped with a sailboat and three canoes for moving my outfit."

Of this survey, we find the following reference on Page 23 of the report of the U.S. Geological Survey of 1909: "There is an excellent topographic map of Yakutat Bay and vicinity, made from a photographic survey, conducted by A. J. Brabazon in 1895. This map was of great use in geological expeditions, and is employed as the base for the general maps of the region that accompany this volume. The photographs, upon which the survey is based, are of excellent character and have been of much value in the study of the physiography of the region. This survey ranks with the Russell and Gilbert explorations, as one of the most important geographic expeditions of Yakutat Bay."

H.R.H. THE DUKE OF ABRUZZI — Six years after Russell, H.R.H. the Duke of Abruzzi, an Italian of international fame, with a corps of his own guides, landed on the margin of the Malaspina Glacier near point Manby, and took a straight course north across the surface of the

Malaspine to the margin of the Seward Glacier. Crossing this Glacier above Point Glorious, he reached the Newton Glacier by the Dome Pass (first explored by Russell) and reached the summit of St. Elias by the Russell Col on the 31st day of July 1897, thirty days after landing on the Coast.

Little, relative to Mt. Logan's immediate surroundings, had been disclosed so far, but on this ascent, as soon as the expedition reached a point on the northern slopes of St. Elias sufficient to give a clear view to the north, past the Newton-Augusta Range, the whole hitherto unseen hinterland was revealed.

The photographs taken from the summit of Mt. St. Elias by Sella (of the Duc d'Abruzzi's party), showed for the first time the great mass of Logan stretching across the northern horizon, and separated from the St. Elias system itself by the Seward and Columbus Glaciers. These photographs subsequently proved of the greatest value in developing the topography of this section of the International Boundary Sheets, where information in places was entirely lacking. Sella's photographs showed new worlds of mountains, hitherto never seen. Through this expedition many new names were added to our maps and much information of all kinds obtained. Eighty miles to the north westward a high snow plateau was named Mt. Bona (16,420), another Mt. Bear (14,850) sixty eight miles, almost due north, and Mt. Lucania (17,150) fifty three miles to the north east. The sources of the Seward were also

for the first time seen and a great new glacier named - The Columbus - flowing in an opposite direction from the head of the Seward. (From the summit of Mt. St. Elias the Logan mass was referred to in the following way: "But the Logan Chain was the most majestic of all."

H.S.BRIANT 1897 During the same year, the New York Times sent its second expedition under the leadership of H. S. Briant, who unfortunately met with misfortune, but heroically bade the Duke's party God speed, as the successful expeditions passed on their upward trail.

INTERNATIONAL BOUNDARY SURVEYS (SOUTHEASTERN ALASKA SECTION)

In 1911, to primarily determine boundary peak "4830" and to secure photographs to supplement those taken in 1895 by Mr. A. J. Brabazon, two expeditions under Mr. M. J. Ogilvie entered the region by way of Yakutat Bay. One under Mr. Herbert Mussell landed on the north shore of the Bay near Russell's landing of 1890, July 1st, and reached the Seward Glacier, keeping out on the smoother surface of the Malaspina and thereby made it possible to use sleds to advantage, and to naturally cut down the labour of back-packing. Mr. Mussell's party was fortunate in having splendid weather, and besides occupying "4830" near the Dome Pass, occupied camera stations on the east and west sides of the Seward Glacier. The expedition returned to the shore without mishaps, with a splendid lot of material, which made it possible later to plot the topography of this section in a very satisfactory manner.

The other expedition, under Mr. Dennis, ascended Disenchantment Bay and, landing on the east side of the Russell fjord, worked up the Variagated Glacier and then later the Nunatuck Glacier, occupied camera stations along the crest of the range adjacent to Mt. Seattle.

The results of this survey, taken in conjunction with those of 1895 and the subsequent surveys carried out by Mr. Mussell the following summer at the top of the ice shed on the Nunatuck Glacier, completed the field work necessary to complete the maps now being published by the International Boundary Commission. As far as is known, these are the last surveys made in this district.

INTERNATIONAL BOUNDARY
SURVEYS (141st MERIDIAN
DELIMITATION 1913)

The 141st Meridian, the straight line portion of the International Boundary line was the last to receive attention. In 1906 this work commenced at its crossing of the Yukon River. At the close of these surveys in 1913, the most difficult section of the whole meridian was undertaken at its southern end, where the coastal range is pierced as far as the St. Elias range. The meridian passed within twenty-one miles of the summit of Logan, and the final product of this work, in which both countries played such important parts, was the mapping of upwards of 500 square miles of new country and establishing three monuments, two of which are on the edges of the Valley of the Logan Glacier.

Still blank areas are shown on our maps, of which

Kluane ✓

little is known. Of these, a section between the western watershed of Lake Khrane and eastern slopes of Logan, is of unusual interest; up to last summer (1925) as far as is known, this section had not previously been seen. From the summit of Logan it appeared a chaos of low rocky ridges, apparently made to appear so by the high level of the ice, filling the valleys. These glaciers may form the highest of the region and constitute the very head of the sources of the Logan, as well as the Seward and many other large glaciers.

Photograph taken by the late Wm. Ogilvie in 1894 from Khantaak Island in Yakutat Bay showing the margin of the Malaspina Glacier along a sea coast 60 miles long ,and beyond,Mt.St.Elias over 60 miles distant. Extreme left the Chaix hills . The next photograph shown joins this on the right.

65-D
94

Photograph taken by the late Wm. Ogilvie in 1894 from the shore line of Khantaak Island showing distinctly the outline of the Logan massif ,being 68.26 mi. distant . The nearest point of the margin of the Malaspina glacier is 12 miles.

It seems strange that with this evidence that the Logan massif was visible from the sea,that it should have remained for so long in obscurity.

Photograph taken by Wm. Ogilvie in 1894 of the St. Elias Range , showing Mt. Logan , from the shore line of Khantaak Island . The horizon line being defined by the margin of the Malaspine glacier ,vertical angles to Logan . St. Elias , King Peak and other peaks visible (the camera being at the water line) ,could be worked out and a rough check on the elevations obtained . The Camera taking this picture (Do. Obs. No. 55.) by J.H.Dallmeyer , Optician , London , has a focal length of 5.82".

Ogilvie's old camera used in Dawson (which had silk collapsible sides) had a focal length of 7.25".

HISTORY OF THE MASSIF AND VISIBILITY

FROM THE SEA

The Visibility and History of Mt. Logan is a short story - Visible out to sea from many angles, it must have been seen from very early times, but completely escaped notice, or even mention, while St. Elias as the major peak of the district, remained predominant.

In 1838, however, we have Topham's interesting speculation that the highest point of the system would be found north of St. Elias.

LOGAN RECEIVES ITS NAME — On August 8th, 1880, from the summit of the pinnacle Pass Cliffs, at an elevation of approximately 5,000 feet, I. C. Russell saw and thus describes the mountain:-

> "The clouds parting toward the northwest revealed several giant peaks not before seen, some of which seem to rival in height St. Elias itself. One stranger, rising in three white domes far above the clouds, was especially magnificent. As this was probably the first time its summit was ever seen, we took the liberty of giving it a name. It will appear on our maps as MOUNT LOGAN[x], in honour of Sir William E. Logan, founder and long director of the Geological Survey of Canada."

x I.C. Russell, elevation 19,500 ft.
J.E. McGrath " 19,539 ft.
H.F. Lambart 1913 " 19,850 ft.

From Khantaak Island [illegible] Wm. Ogilvie, in 1885, secured photographs of Logan appearing above the St. Elias range.

It remained for H.R.H. the Duke of Abruzzi, in 1897, however, to secure the first full view of Logan from the summit of St. Elias, as already described.

The Boundary Survey of 1913 engaged primarily in delimitating the boundary and marking the crossing of the 141st Meridian at the Logan Glacier, sent as well topographical survey parties up the Logan Glacier, the Chitina Glacier and a third party crossing the Logan and ascending the Baldwin Glacier, entered the country directly West of the Logan massif, while a fourth party crossed the shed of the Seward and Columbus Glaciers and reached a point 16,000 feet above the sea on the shoulder of St. Elias. The result of these surveys was a map of the region, which was highly satisfactory, and for the first time Logan took its place upon a map.

MT. LOGAN PHYSICAL FEATURES

Logan, lying 26 miles further inland than St. Elias, regarded as the greatest mountain mass of the globe, rises 14,000 feet above its surrounding glaciers in walls of rock along its northern and southern faces and so steep that snow cannot lie upon it, while the east and west extremities of the massif are marked by two subsidiary peaks, one on either side, McArthur peak (14,400 feet) on the east and King Peak (17,130 feet) on the west.

If this mountain were cut through at the ten thousand foot level, it would be found to be over 16 miles long in an east and west direction, and would cover an area of 100 square miles. Superimposed upon an upper plateau, which can be regarded at 17,000 feet above the sea, is built up an amazingly complex system of Glaciers, snow-fields, ridges and peaks rising from 18,000 feet at the extreme western to 19,850 feet on the eastern.

GEOLOGY The Logan massif would appear to be much older in the geological scale than the St. Elias range, which is separated from it by the great valleys of the Seward and Columbus Glaciers lying immediately to the south.

At the 10,000 foot level at "Observation Point" shattered rock in great slabs is exposed; these appear of igneous origin, while just across the King Glacier the rock is more crumbly, and of sand stones and schists.

Unlike the roof-like rugged angularity, showing

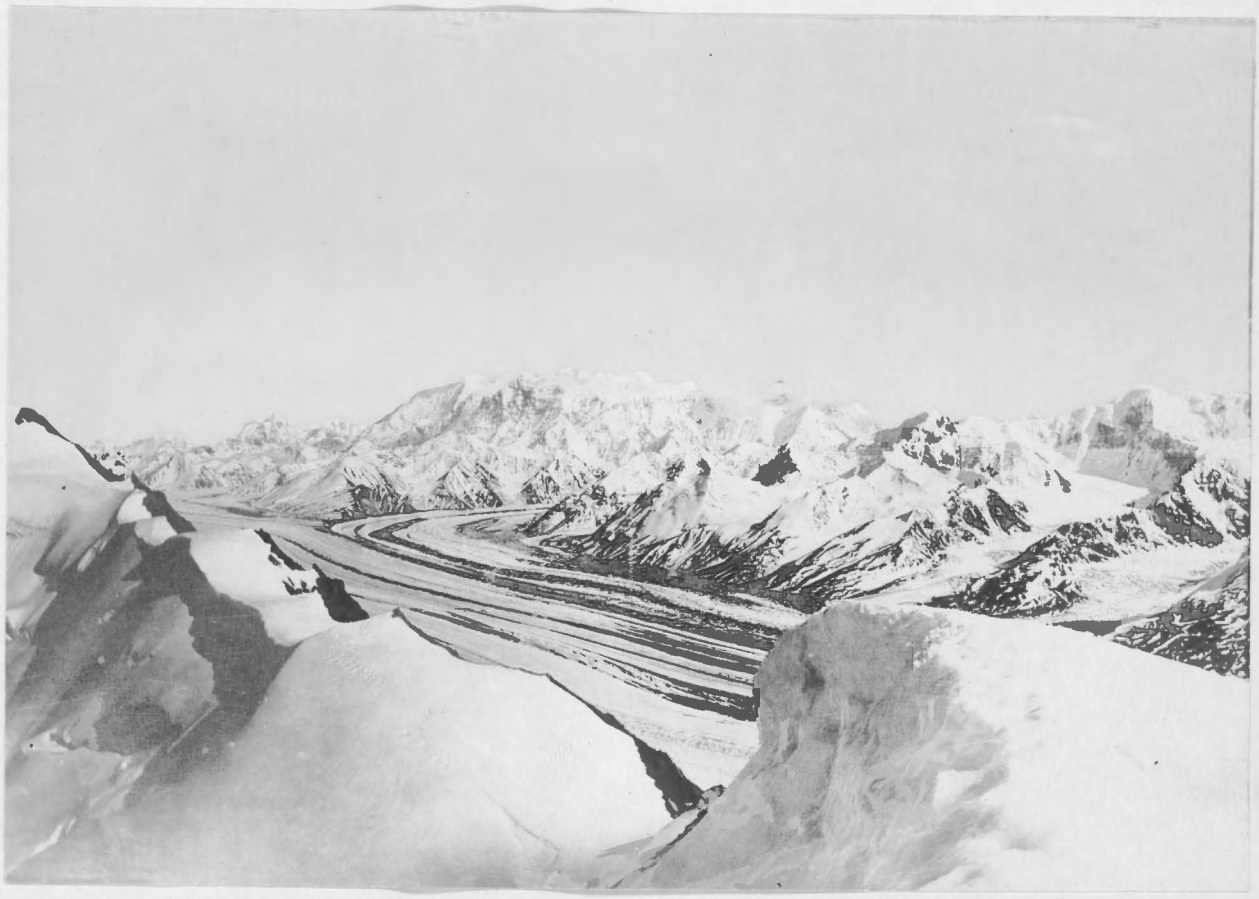
little signs of disintegration of the St. Elias range, the Logan massif is rounded and shows more signs of erosion, or if not this a distinct difference in the form of its upheaval, as little of the massif is exposed. One exception to this general formation is that of King Peak, which has a sharp summit ridge. With the strata dipping toward the south, the Seward and Columbus Glaciers appear in the trough of a Synclinal, running east & West.

The trend of the blanket of ice, which covers the top of the massif, is towards the North. The domes rising from these snow fields are mostly clustered along the south edge of the escarpment, which breaks straight away to the surface of the Seward Glacier in cliffs 10,000 feet in height.

The ice blankets or snow fields are remarkably smooth and rounded and little creviced, the snow consolidating quickly. The party did not sink more than 18 inches anywhere in traversing the top on June 21st to 26th.

The final dome, being the steepest part touched while on the climb and being constantly wind-swept, was found very hard crusted.

A general discussion of the geology of the district, but confined chiefly to the upper part of the Chitina Valley, is to be found in Bulletin 675, of the U.S. Geological Survey.



Boundary Survey photograph by T.C.Dennis in 1913 showing in the distance the massif of Mt. Logan and McArthur and King Peaks and below the Logan glacier and the junction of the Ogilvie with it . The point of land formed by the junction was the site of the old Boundary Survey's "Turn", the Mt. Logan Expedition's "Turn" was placed out on the ice 2 miles west on a large central morain.

GLACIERS AND DESCRIPTION OF ENVIRONMENT

GLACIERS — The speed at which the expedition entered and left the country made it impossible to make any glacial studies. Especially is it regrettable that no new information was obtained regarding the motion of the glaciers traversed.

The ablation of the surface of the Ogilvie Glacier, however, was very apparent by the formation of glacier tables during our absence. This would indicate that at the 6,000 feet elevation the lowering of its surface was at the rate of about two inches per day while at its head (Elev. 7800 feet) the amount of the daily drop would appear to be about half that amount.

Apart from the south Polar Ice Cap and the continent of Greenland, this region, of which Mt. Logan is the predominating feature, presents probably the most intensely glaciated district of the globe. Of the total area of Alaska about 4% is glaciated ice covered terrain, which amounts to something of the order of 15,000 to 20,000 square miles.

DISTRIBUTION OF GLACIERS — The existing glaciers are chiefly confined to the mountain regions and extend more or less continuously through 1100 miles, along the coast, and throughout the Mt. St. Elias ranges. These snow fields and glacier belts average from 40 to 120 miles in width. There are also scattered glaciers and volcanoes through a distance of 500 miles along the Alaska Peninsula and Aleutian Islands.

LOCAL CONDITIONS RESPONSIBLE — It is the combination of lofty mountains facing a

sea coast where warm, humid, onshore winds bring abundant moisture, in a northerly latitude, that gives the Pacific Mountains of Alaska from 80 to 200 inches of precipitation yearly. It is the height of these mountains, and the northerly latitude, that causes a large proportion of this precipitation to fall in the form of snow. Therefore much more snow falls in a winter than can melt during a summer, causing permanent snowfields and great glaciers. The variations in altitude, in precipitation, and in direction of slope cause the principle variations in the present size and condition of the glaciers.

In glacial epochs snow and ice accumulated in the high mountains and gradually crept down into the smaller valleys and out into the larger ones till they filled them completely leaving only the tops of the high mountains uncovered. It is doubtless correct to assume that when the glacial epoch began nearly all the main drainage lines had been established in essentially their present position. The great trunk streams of ice were then doubtless as they are today. Named in the order of their magnitude, are:-

1st. The Seward, directly to the south of the great mass of Logan, takes its source at the western end of the great defile between the steep southern face of Logan and the Mt. St. Elias - Mt. Augusta ranges, join another and larger trunk descending from the north east and flowing between the narrow passage of the Corwin Cliffs and a spur of Mt. Cook, joins, as one of its main arteries, the mighty body of ice constituting the Malaspina Glacier,

2nd. The Columbus Glacier taking its source in the great

tributaries of the west face of Logan - constituting the Quintino Sella Glacier system - and receiving the tributary glaciers flowing from the northern face of the Mt. St. Elias range west of the International Boundary, flows out westward and finds its way eventually to the sea.

3rd. The Logan Glacier immediately to the north of the Logan Massif carrying its width of 3 to 4 miles for a distance of fifty miles and being joined by the two large parallel systems of the Walsh and Chitina Glaciers, constitutes the main drainage of the Chitina river valley. Of the upper neves of these three great trunk streams little is known as they are still blanks upon our maps. The summit of the drainage of the Walsh and the Logan may at least be vaguely defined as lying to the north east of the Logan Massif; and that of the Chitina Glacier as lying immediately on the Canadian side of the International Boundary and bounded by a mighty cirque created by the group of the highest peaks rising north of Logan, namely Mt. Bear (14,850'), Mt. Craig (13,250'), Mt. Wood (15,880') and Mt. Lucania (17,150').

4th. The great nameless and unknown chaos of mountain ranges and ice, stretching for sixty miles towards the north east of Mt. Logan Massif. A small fraction of this area was seen by Mr. Dennis and his party when in 1913, the Boundary Surveys were operating in the upper reaches of the Logan Glacier and had penetraded to distances hitherto untrodden. Mr. Carpe's photographs from near the summit of Mt. Logan on the northern and north eastern slope of the Massif this year, gave

for the first time some conception of the complexity of this system. Photographs taken at a distance of twenty miles revealed the high elevation of the vast snow fields but the direction of their flow could not be gauged; it appeared possible, however, that these might be at an altitude much higher than has hitherto been recorded for the district. The eastern drainage of this area is the Kalkawulsh Glacier and the Kluane Lake district. Also the Donjek River is fed by glaciers which border the north eastern side of this same area.

Of the exact rate of the movement of these immense ice fields, little is known; certainly there has been no recent movement of the Chitina Glacier. Some idea of the movement or the lack of movement can be furnished by the timber that grows on the debris overlying the foot of the Chitina Glacier. Mr. D. W. Eaton of the Boundary Surveys has given the information that he cut a spruce on the end of the Chitina that showed 193 rings of growth. The overlying debris and loam accumulation is now very thick and the ice underneath evidently has moved but very little in many years.

Glaciation in these vast fields of upwards of 12,000 square miles in extent, it is said, is still effective in the higher parts of the district but may be regarded as the last great event in the geological history. The withdrawal of the ice, hoever, merely, allows weathering to commence a new cycle of events that will eventually destroy all signs of the work of the ice. Few of the glaciers of Alaska are advancing and these great systemsare gradually becoming smaller. The following reference to glacier action in Glacier Bay 175 miles

distant to the south east may prove of interest although their reliability cannot be vouched for. In 1886 it is said that the Muir Glacier discharged over a cross sectional area of 5,000,000 sq. feet, 200,000,000 cubic feet of ice per day.

Of the 646.5 miles of International Boundary line from Mt. St. Elias to the shores of the Artic Ocean only this portion of the southern end crosses snow clad mountains.

EXPEDITION MOOTED, FORMATION AND PREPARATORY WORK

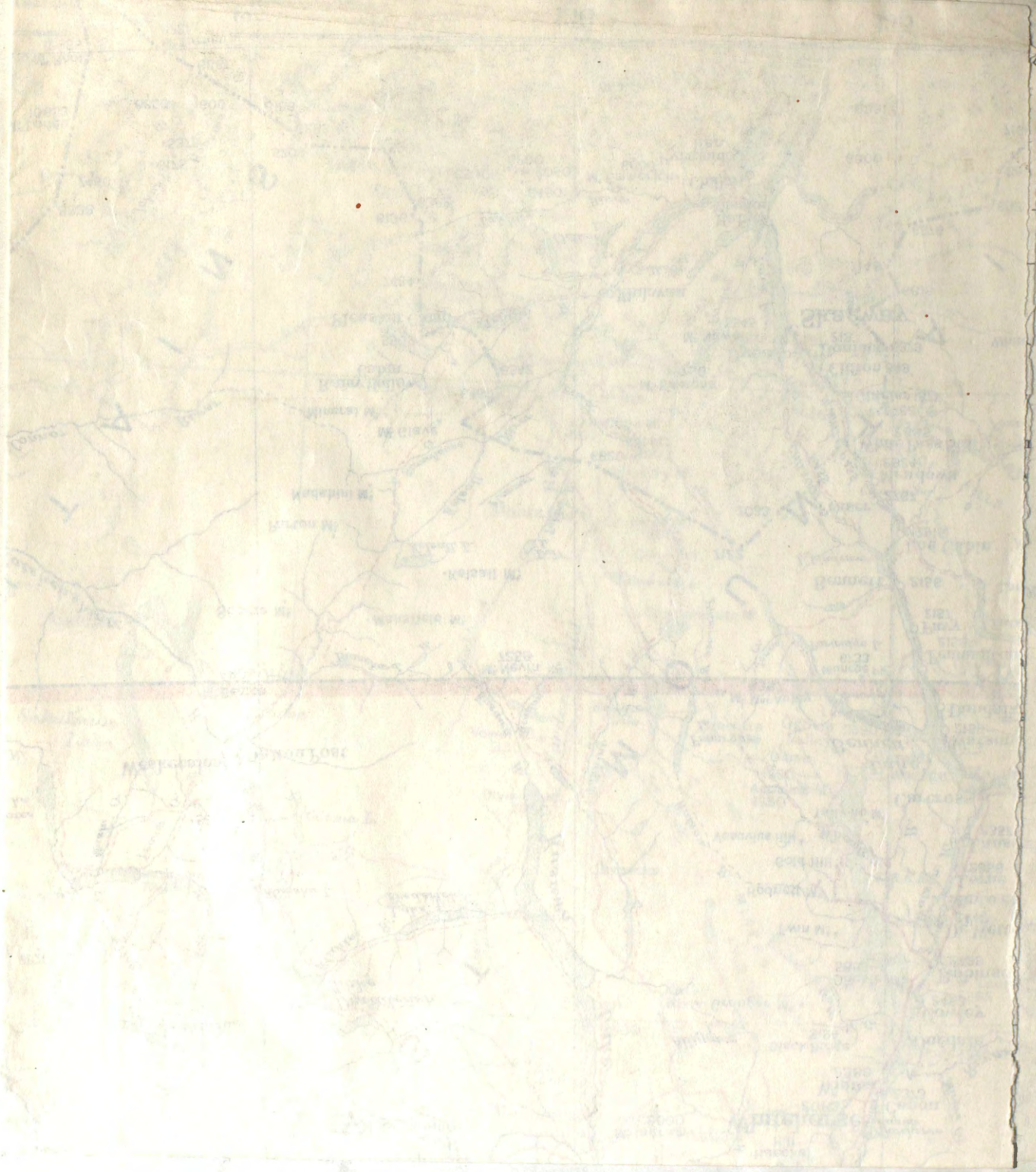
In the year 1922, professor A. P. Coleman of Toronto University, the veteran geologist and mountain climber, made the suggestion to the Alpine Club of Canada that a serious attempt should be made on the mountain. In 1923 at the Larch Valley summer camp of the Club, the first committee was formed to take action in connection with an expedition to Mt. Logan.

This committee met in Vancouver in November and dealt with the formation of an expedition and chosing of its personnel, which proved most difficult.

Expectations to send the expedition forth in the spring of 1924 failed due to the lack of adequate response to the appeal for support and also upon the shortness of the time available to make the necessary preparations.

The delay of one year that followed gave the leader an opportunity to look the ground over, his great interest in the undertaking taking him to Alaska.

Before leaving, the two leaders met in Ottawa in February and traced out on the International Boundary plans a route to the summit which later proved its value, as it was followed with little diversion all the way.



SECTION OF MAP (SCALE 16mi = 1") SHOWING YAKUTAT BAY AND KLUANE LAKE ROUTES.

1 - The alternative routes under consideration, to reach the Logan Massif are shown.

2 - Shows the route over the Malaspina Glacier from the shores of the Yakutat Bay to the Seward Glacier past the southern face of the massif to the western end.

3 - Shows the proposed route in from Kluane Lake, abandoned on account of the unknown stretch of country between the Slims River and the eastern base of Logan.

Snag
Wellesley L.
Canyon City
Mt Natazhat
Mt Constantine
Mt Bear 14850
Mt Craig 13250
Mt Wood
Mt Steele 16439
Mt Walsh 14498
Mt Logan 19539
Mt St Elias 17975
Mt Augusta 14067
Mt Vancouver 15696
Mt Cook 13754
Mt Alverstone 14493
Mt Hubbard 14950
Mt Seattle 10082
Mt Jotte
Mt Aylesworth
Mt Hendrickson
Mt Tebenkof
Mt Unana
Malaspina Glacier
YAKUTAT BAY
Pt Manby
Ocean Cape
Yakutat
NORTH PACIFIC OCEAN
ST ELIAS MOUNTAINS
COAST MOUNTAINS
DAWSON RANGE
Donjek
Nisling
Klaza
Kluane Lake
Kluane Hills
Kluane
Burwash Landing
Ruby Range
Ruby Camp
Aishihik
Aishihik Lake
Sekulmun Lake
Dezadeash River
Canyon
Champagne
Dezadeash Lake
Kathleen L.
Dalton Post
Wesketahin
Alsek River
Tatshenshini
Mt Fairweather 15399
Mt Root 12955
Mt Lodge 10653
Mt Turner 8721
Yukon Crossing
Hutshiku
Carmacks
Wayside Inn
Montague
Braeburn
Little Salmon
Big Salmon
LEWES RIVER
Minto
Tatlmain Lake
LAKE LABERGE
Lower Laberge
Upper Laberge
Richthofen I.
MINERS RANGE
Little River
Mendenhall Landing
Takhini
Whitehorse
Canon
Wigan
Dugdale
Cowley
Robinson
Carcross
Lake Bennett
Bennett
Log Cabin
White Pass Sta.
Skagway
Dyea
Klukwan
Haines Mission
Chilkat
Pyramid Har.
LYNN CANAL
Pleasant Camp
Rainy Hollow Cabin
Kusawa Lake
Mt Ingram 8000
Mt Beaton 6900
Mt Nevin 7259
Dome Pass
140
139
138
137
136
135
61
60
59

THREE ALTERNATIVE ROUTES CONSIDERED

Logan, as is seen, possesses three general routes of approach all of which were carefully considered.

The all Canadian route - by way of Skagway on the coast leads over the White Pass by the White Pass and Yukon Railway to Whitehorse and from thence by road to Lake Kluane, then from there to the head of the Slims Glacier over sixty miles of absolutely unknown country to the east end of Logan.

Although free transport to the head of Lake Kluane had been offered by the Railway Company, the Committee wisely decided against this route regarding the 60 miles of absolutely unknown territory too much an element of uncertainty.

The route straight over the Malaspine Glacier, north from the shores of the Gulf of Alaska, had its three very bad failings, namely,; that of 1st. An excessive precipitation and periods of very fog laden weather; 2nd. The difficult and dangerous landing on the coast; 3rd, and most serious point; That the south face of Logan gave no promise of success, being steep rock cliffs rising from the surface of the Seward, and in reaching this face, being forced to make a complete traverse of the base to the north face.

The third and only logical course, all things being considered, was that already traversed to the northwest face of the mountain, by the Boundary Surveys in 1913, from McCarthy (191 miles from tide water) on the Copper River and Northwestern Railway, across the Nazina to the entrance to the valley of the Chitina, and by this valley

88 miles in an easterly direction to the timbered toe of the glacier of the same name, which completely crosses the valley at that point, and from thence to a base camp at the head of the Ogilvie Glacier at the extreme west end of the Logan Massif, by travelling 50 miles in succession the Chitina, Walsh, Logan and Ogilvie Glaciers.

MacCarthy's 1924 Reconnaisance

Mr. MacCarthy arriving at McCarthy the last day of May, 1924, started out on the trail up the Chitina River Valley on June 4th, with two companions, Mr. A. M. Taylor and Miles Atkinson - Harry Boyden, packer, who accompanied the little party to a point on the edge of the ice at a point at the foot of a small dead glacier (marked "T" on plan), where he turned back with 8 horses.

On June 11th, Mr. MacCarthy, with his two companions, now commenced (the only summer means of transportation beyond this point) the arduous business of back-packing 700 pounds of food and equipment to the base of the mountain at "Cascades", in a series of first four and laterly two relays and finally established themselves at this camp by the end of the month. Here at an altitude of 7800 feet they remained until July 6th, making frequent trips to a point at 10,000 feet, a rock ~~nunatuck~~ NUNATAK on the King Glacier. So far the travelled route presented no great difficulties, but immediately beyond Cascades the difficulties developed. A route, however, was worked out on the right side of the ice cataract above them. From "Observation Point" they had expected to clear view up the trench of the King Glacier, which they certainly would have had if the weather had been at all favourable. Whether this route was a cul de sac, or gave a clear avenue of ascent, is what they came all this way to find out as this section had not been covered with the photographic information and, if impassable, would have thrown out this means of ascent entirely.

Unfortunately, due to constant fog and bad weather, with frequent snowstorms, not a single opportunity presented itself and the

party with little food left reluctantly was forced to turn back and retrace the long trail back to McCarthy on June 8th.

This trip of 44 days from McCarthy cost them a great deal in time and hard work, with apparently little to show for it, but it can safely be said that much of the success of the handling of the freight during the latter end of the following winter, and indeed to the success of the expedition itself, is due in no small measure to the first hand knowledge gained during this initial reconnaisance trip.

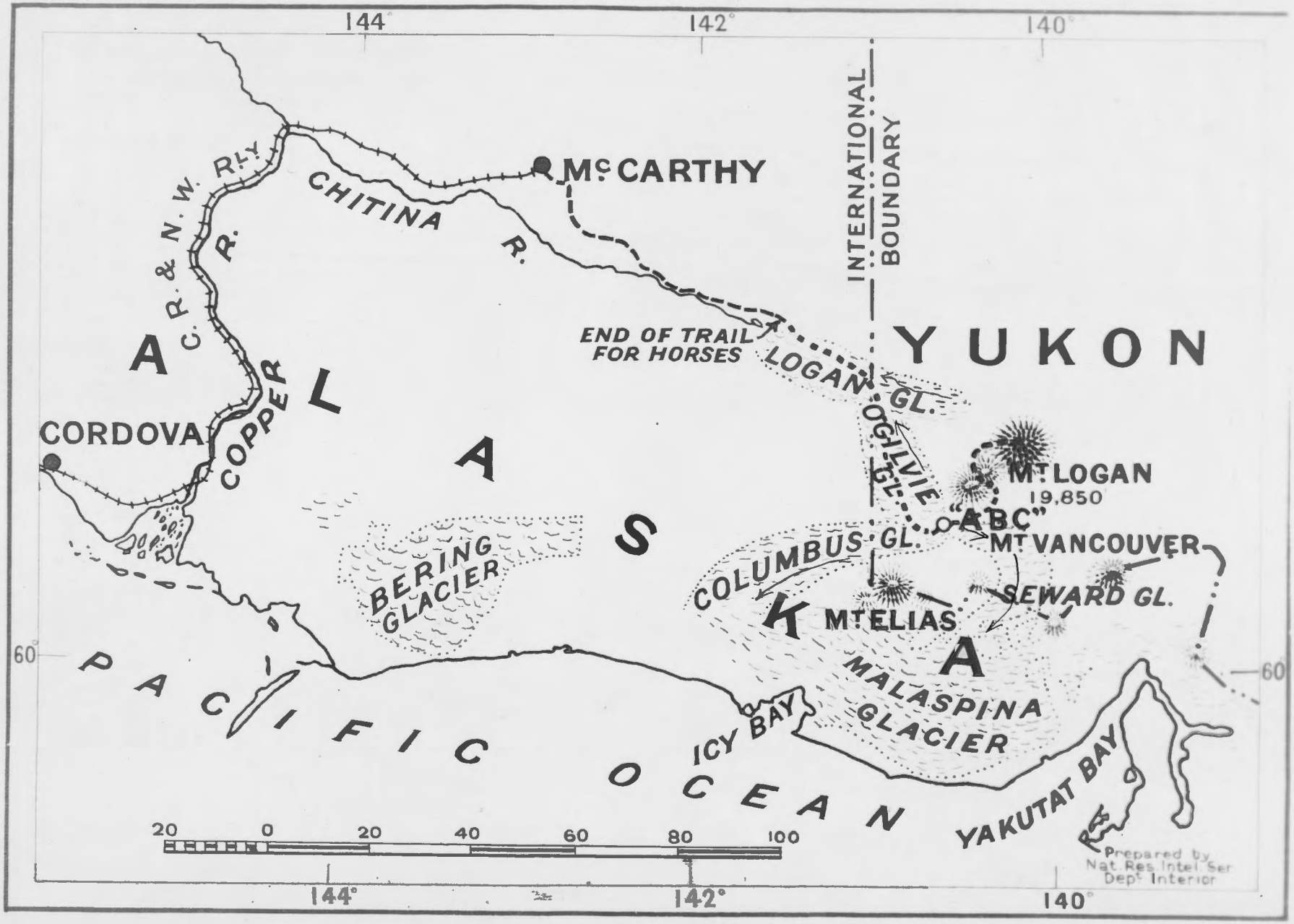
At the annual camp of the Alpine Club at the summit of the Robson Pass at the end of July Mr. Mac McCarthy related his experiences and outlined his views with regard to the best means of carrying out such a venture to success.

It was made plain that no climbing party in itself without previous preparation in laying caches along the line of march, and establishing a base camp, if not well up on the Ogilvie Glacier, at least at "Turn", (at the junction of the Ogilvie and Logan Glaciers), could hope for success.

The immediate outcome of Mr. MacCarthy's disclosures was a renewed interest in the undertaking, in which the American Alpine Club and the New York section of the Club took such an active interest, together with generous considerations from the Alpine Club (England) and the Royal Geographical Society.

Careful plans were worked out and the details of an elaborate equipment brought to an end, which, together with all provisions necessary purchased at Seattle, left for Alaska January 17th, 1925, and a final one on February 7th.

All was on the ground well in advance of the time required for the winter freighting.


144°
142°
140°
INTERNATIONAL BOUNDARY
McCARTHY
C.R.&N.W. Rly.
CHITINA R.
COPPER R.
CORDOVA
END OF TRAIL FOR HORSES
LOGAN GL.
OGILVIE GL.
YUKON
ALASKA
M.t LOGAN
19,850
"ABC"
M.t VANCOUVER
SEWARD GL.
COLUMBUS GL.
M.t ELIAS
BERING GLACIER
MALASPINA GLACIER
ICY BAY
YAKUTAT BAY
PACIFIC OCEAN
60°
20 0 20 40 60 80 100
Prepared by
Nat. Res. Intel. Ser
Dept Interior

Winter Freighting

Anxiety was felt regarding the handling of the freight beyond McCarthy, and knowing that the success of the expedition depended upon whether our caches were properly placed, Mr. MacCarthy decided to return to Alaska and superintend this undertaking also.

Previous to his arrival at McCarthy on Feb. 15th, Andy Taylor with "Trim" with one two-horse team, had made the 60 mile trip through to Bryson's Camp and back in 9 days, taking half (5800 lbs) of the total load thus far.

On the 17th one four-horse team and one two-horse team with three dog teams (21 dogs in all) left McCarthy with 13,500 pounds of provisions, freight and feed, making a total of 18,296 pounds handled out of McCarthy - almost three times the weight that is actually to be delivered at the end.

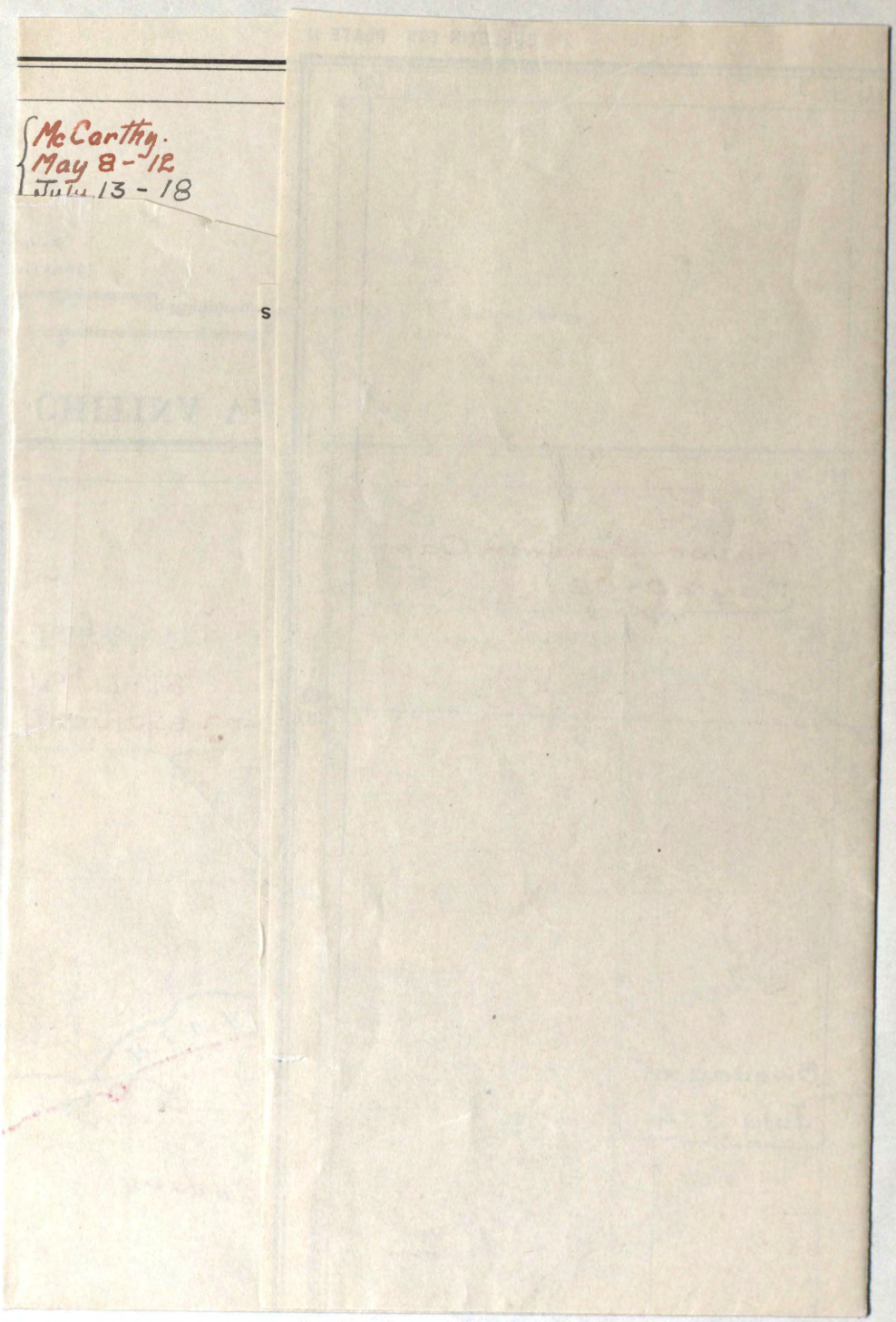
In 11 days (Feb. 27th) the foot of the Chitina Glacier, 88 miles distant, was successfully reached. Difficulties of abnormally bad weather, with temperatures 35 degrees below zero with open water running over bare gravel bars, was experienced.

With 6000 pounds of freight to handle over the rough glaciers an effort, now, before starting on, was made to shorten and better, if possible, the trail used heretofore, by trying the south margin of the Chitina, which was condemned by Reaburn and Dennis in 1913. This scouting resulted in a discovery of a 7 or 8 mile gorge between the glacier and the ~~south,~~ south wall of the valley, which they called the "Gorge of Fate" and up which a passage was forced on a precarious rim of ice, marking a previous water lever of the stream now running its course some feet below. One cannot help feeling that this was a very good piece of good fortune, without which

it is difficult now to see how the freight would have ever been handled in the time required.

On March 6th all had been safely cached 4½ miles up the gorge and the teams (one two-horse and one four-horse) left on their return journey to McCarthy. From this point now the dog teams had to bear the brunt of the hard work and with constant and arduous sledding with many relays. Mr. MacCarthy, with his two men, successfully laid the four intermediate caches required and the main cache of 4700 pounds 45 miles to a point on the Ogilvie Glacier 7 miles above its junction with the Logan. This work is admittedly one of the finest pieces of freighting ever carried out in this country, where transportation is the one and abiding great problem.

Unfortunately, it took longer than was expected and in consequence Mr. MacCarthy's return journey south to Vancouver had to be cancelled and, therefore, met the incoming expedition at Cordova on May 7th.



U. S. GEOLOGICAL SURVEY SHEET FROM BULLETIN NO. 675 ON THE UPPER CHITINA VALLEY
Scale 4 mi. - 1 in.

Showing trails going and returning from McCarthy, Alaska, to the ice of the Chitina, Walsh and Logan Glaciers.

U. S. GI

Showing trai

of the Chiti

McCarthy.
May 8-12
July 13-18

Martin-Harris Cabbin
May 12-13

Undercliffe Camp
May 13-14

Fraser-Baldwin Camp
May 20-22.

Rush Pond
July 11-12.

Flat Camp
May 14-15

Rafts left
July 11.

Bivouac of
July 3-4.

Chitina Point Camp
(Walsh Camp)
May 19-20.
July 4-5.

"T"

Bryson's Camp
May 15-16

Short River Camp
May 16-17

Hubricks Camp
May 17-18
July 6-11

Trail End
May 18-19
July 5-6

Alfred H. Brooks, Geologist in charge of division.
Topography by International Boundary Commission,
F. H. Moffit, D. C. Witherspoon, and T. G. Gerdine.
Control by International Boundary Commission
Surveyed in 1900, 1908, 1913, and 1915.

RECONNAISSANCE MAP OF UPPER CHITINA VALLEY, ALASKA

Scale 1/250000

5 0 5 10 Miles

5 0 5 10 Kilometers

Contour interval 200 feet.

Datum is mean sea level.

PRINTED AND PUBLISHED BY THE U.S. GEOLOGICAL SURVEY

House Doc. No. ; 65th Cong.,

GENERAL MAP OF THE INTERNATIONAL BOUNDARY(141ST MERIDIAN) SURVEYS

Showing the trail (in and out) of the expedition from the edge of the ice to the summit.

GENERAL MAP
OF THE REGION TRAVERSED
BY THE INTERNATIONAL BOUNDARY LINE
ALONG THE 141ST. MERIDIAN
BETWEEN WHITE RIVER AND MT. ST. ELIAS

PREPARED UNDER THE DIRECTION OF

UNITED STATES COMMISSIONER
E.C. BARNARD

HIS BRITANNIC MAJESTY'S COMMISSIONER
J.J. McARTHUR

Short River Camp
May 16-17.

Hubricks Camp
May 17-18, July 6-11.

Trail End
May 18-19 July 5-6

Chitina Point
(Walsh Camp)
May 19-20 July 4-5

Fraser-Baldwin Camp
May 20-22.

Ice Bivouac
July 3-4

Boundary Camp
May 22-23

Advance Base Cache
May 25-31

Cascade Camp
May 26-June 3
June 28-July 1

Observation Camp
June 3-9

Turn Cache
May 23-25
July 1-2.

Hurricane Ridge June 26

Bivouac in Open
June 23-24

Camp "18.5"
June 21-22

SUMMIT
OF MT.
LOGAN
June 23 8-8.25 P.M.

First Summit
June 23-4.30 P.M.

Plateau Camp
June 22-23 June 24-26

Windy Camp
June 16-21

Ice Cliffe Camp
June 14-16

King Col Camp
June 8-14
June 26-28

Scale 1/250000

4 0 4 8 12 Miles

4 0 4 8 12 16 Kilometers

Contour interval 250 feet.

BOUNDARY LINE ——— — — ———

ROUTES TRAVELED ----------

PANORAMIC STATIONS ⊙

COMPILED BY RAYMOND L. ROSS

FROM SURVEYS BY BOUNDARY PARTIES IN CHARGE OF

FOR THE UNITED STATES	FOR HIS MAJESTY
D.W. EATON	H.F.J. LAMBART D.L.S.
A.C. BALDWIN	T.C. DENNIS D.L.S.
W.C. GUERIN	D.J. FRASER D.L.S.
THOMAS RIGGS, JR.	H.S. MUSSELL
	J.D. CRAIG D.L.S.

AND U.S. GEOLOGICAL SURVEY MAPS

Mt Bear 14850
Mt Craig 13250
Mt Wood 15880
Mt Anderson
Mt Tittmann 11000
Mt George
Mt Chitina
Mt Lucania 17150
Mt McArthur Peak 14400
King Peak
MT LOGAN
Table Mt 9360
Mt Huxley 12560
The Hump
MT ST ELIAS
Mt Jeanette 12075
Mt Baird
Mt Malaspina 12150
Mt Augusta
Corwin Cliffs

Brabazon Glacier
Hawkins Glacier
Barnard Glacier
Short R.
CHITINA RIVER
Anderson Glacier
Titmann Gl.
Baldwin Glacier
Fraser Glacier
Barton Glacier
Mussell Glacier
Quintino Sella Glacier
Newton Glacier
Agassiz Gl.
Augusta Gl.
Seward Glacier
Harvard Glacier
California Glacier
Bennett's Glacier
CHITINA GLACIER
WALSH GLACIER
LOGAN GLACIER
COLUMBUS GLACIER
SEWARD GLACIER

61°20′ 61°00′ 60°40′ 60°20′
142°00′ 141°40′ 141°20′ 141°00′ 140°40′ 140°20′

The Expedition as it left McCarthy Alaska on the 12th day of May 1925 . L to R. Read, Carpe, Foster, MacCarthy,Hall,Taylor, Morgan , Lambart.

THE NARRATIVE

THE CORDOVA, COPPER RIVER and NORTHWESTERN RAILWAY - CHITINA VALLEY ROUTE

After the reconnaisance of 1924 and with the subsequent information obtained, it was clear that this route, in preference to either of the other two, was undoubtedly the best.

In reading Russell and Abruzzi, and later the experience of our own men, we were more convinced than ever that the weather conditions on the coast side of the range presented infinitely more difficulties in this regard. Russell, on one occasion, refers to a possible snow fall for the year of 150 feet, while his own experience on the Newton Glacier in August would seem to bare this out when he relates how he was well nigh burried, and fleeing from his tent, which had collapsed, lived the rest of the time in a snow dugout.

A further examination of Selles photographs of the south face of the Logan Massif made it all the more convincing that any attempt of this face gave but very little promise, and also that the detours either around by the east side of the Massif (which was practically unknown), or by the west side, would consume a great deal of time and lengthen materially the distance of the heavy freight haulage, so the ~~adjustment~~ justification for the route chosen remained sound from the start.

Steamship companies from the Puget Sound running to the south western Alaska ports start from Seattle and not from any of the Canadian Ports.

The best season of the year in which to make the climb had been most carefully under consideration for a long time, and wishing to be on the ground as early as possible, and in reality in advance of the time considered advisable, we find the members of the expedition gathering together with the last details of arrangements completed at the little hotel at Seattle near the dock of our Steamer "S.S. Alaska" at the beginning of May.

Looking down the valley of the Chitina River May 15. Taken when the party was on its way in , about 40 miles below the tongue of the glacier.

The valley of the Chitina River . Left the tree covered terminal moraines of the Chitina glacier and beyond the faint outlines of the foot hills of the Logan range. The centre of the photograph points south . Extreme right is down stream up which the Expedition has come.

Similar to the picture shown above taken from a point near Hubricks Camp with the toe of the glacier immediately opposite . The winters snow still lying in the valley . Around the point of the glacier and against the apposite shore marks about the location of the "Gorge of Fate". Right, a view straight down the valley , Gibralter Rock stands out as an isolated wooded island.

Photographs taken May 17. 1925.

After being kindly entertained by the Mountaineering Club of Seattle and receiving valuable counsel from members of the Parker, Brown, McKinley Expedition, we sailed north on May 2nd with seven of the expedition on board.

Arriving at Cordova on the 7th after a voyage of 1,600 miles along the coast, we left the next day by the C.R. and N.W. railway for a 191 mile rail journey inland to MacCarthy, where we arrived late in the evening.

As the railway crosses the Copper River at Chitina and gradually ascends the Chitina and Kennecott river valleys, the whole of the valley of the former river opens up ahead in a broad expanse and the two days journey of the pack train yet to come from MacCarthy, is clearly visible where it crosses to the top of Sourdough Hill, then descends to the valley of the Nizina, crosses this to the south side to Young Creek, then following around the point of the intervening range, enters the broad open valley of the Chitina river beyond. The view is remarkable in a country hemmed in with snow-capped ranges.

Joined at MacCarthy by Mr. A.M. Taylor the expedition was at last complete and made ready for the long trail. Consisting of a climbing party of eight, with Mr. Hamilton, M. Laing, as Department of Mines' Biologist, together with two packers, Harry Boyden and Peter Bremwick, who were to return with the horses, made up a total of eleven.

McCARTHY 88 MILES TO BUBRICKS CAMP. 6 DAYS. (MAY 12-17)

Leaving MacCarthy on the morning of the 12th with eleven horses carrying supplies and fodder for the trail, as well as extra supplies for Mr. Laing, we started over about the only stretch of road in the district which runs 11 miles to the Nizina River crossing. Here the new Government bridge lands us safely on the other side where, heretofore a difficult ford had to be made.

Old base signal of the Boundary Surveys of 1913 at the foot of the terminal morains of the Chitina glacier still standing in 1925. Boundary mountain in distance and below it the bed of the glacier stream between the main wall of the valley and the tree covered morains of the glacier. It was up this trough the expedition travelled from Hubricks camp to "Trail End".

May 18. From a high point on the surface of the terminal morains of the Chitina Glacier looking westward down the valley of the Chitina river, up which the expedition travelled for 88 miles from McCarthy. Hubrick's Camp is situated at the first distant point seen on the right . Bed of glacier stream traversed seen on right.

So the journey is continued for six days without mishap. We are using horses earlier than usual and come at night to well placed fodder caches left during the winter freighting, as it would be impossible to find grazing. The members of the Expedition are all walking and only the two packers mounted.

The first night was spent 5 miles up Young Creek at the "Martin Harris Cabin", the second at "Underfliff Camp", the third at "Flat Camp" out on the bars of the Chitina and the fourth at "Brysons", an old boundary camp at the foot of the high trail leading over to the head of Young Creek. On the fifth day we have, coming into view of the great toe of the Chitina Glacier completely timbered, stretching across the wide valley with "Gibraltar Rock" in the foreground, and camp for the night just across Short River, the discharge of the Barnard Glacier. Finally on the sixth day, we arrive at the tent marking the old mining camp of "Cap Hubrick's".

HUBRICK'S 50 MILES TO CASCADE, 9 DAYS (MAY 18-26)

This point has been chosen at the lower base camp. It is in the timber just opposite the toe of the glacier and here Laing takes up his stand for the summer to carry on his biological work, as it would not be to his advantage to go much further beyond the limits of vegetation, Here much of our load carried to date is cached and we move on the next day 8 miles further up the valley following the trench between the glacier and the valley rim on the north side to "Trailend". Here the pack trains and two packers turn immediately back, spending the night at Hubtick's Camp, and next morning start back to McCarthy.

The morning of the 19th, though storming, we manage to get away in the early afternoon, commencing the long and heart-breaking back-packing. This day proved one of the hardest of the season, crossing, as our initial effort in this regard, the piled up morains of the Chitina Glacier to Chitina

May 23, just one month from the date of reaching the summit. Lunch on the Logan glacier below the junction of the Ogilvie glacier shown beyond distant bend. The western end of the Logan Massif is seen faintly in the distance.

T No. 45

"Turn Camp" shortly after the arrival of the expedition on the evening of May 23. Looking up the Ogilvie glacier . Morains almost completely covered as yet with the past winters snow. Large cache tent shown,remained at this point during the absence of the expedition . On our return to this point on July 1st. this tent taken out by A.M.Taylor. The cache left here of robes etc was salvaged, or part of it , in March 1926 by A.M.Taylor who made a dog team journey into this country for that purpose

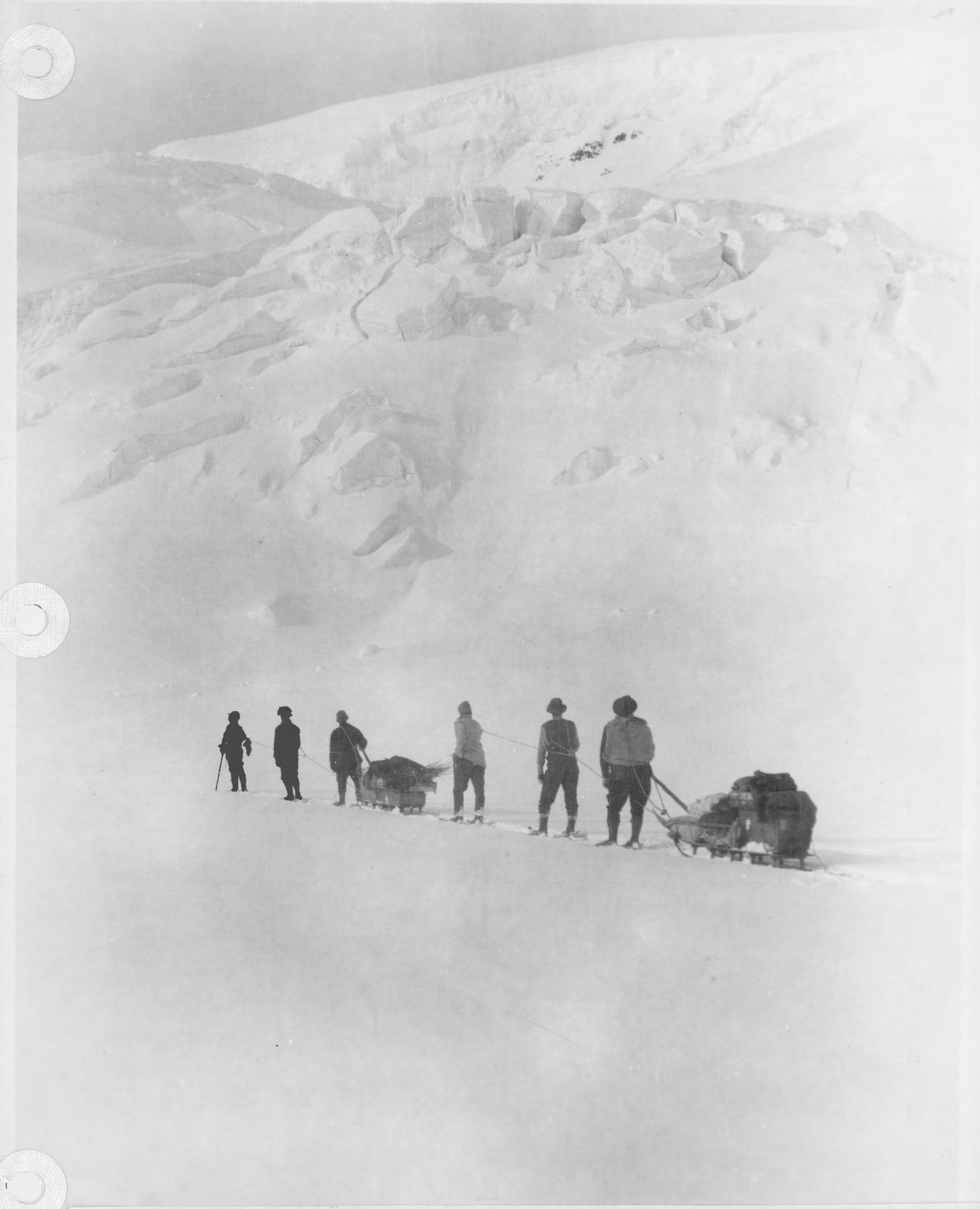
Point Camp. Following the margin of the Walsh Glacier the next day, we come to the old boundary Survey camp known as the "Fraser-Baldwin" Camp - an important base camp of the surveys of 1913. Here the next day we halt our forward march for a day, marking out a trail across the moraines of the Walsh Glacier to the white ice of the Logan, these two glaciers coming together here. At the end of a 12 mile march the following day, we come to a stand for the night on the open moraines of the Logan just before crossing the International Boundary line. Here the winter freighters had wisely left the sleighs (two Yukon 7 bent sleds), all the snow shoes, stoves and oil, together with the usual two day rations, The day was the first of 44 such that were to be spent on the snow and ice of the region before again placing our feet on terra firma.

The night was sinfully short, with a large part of it spent in melting snow to fill the thermos bottles for an early breakfast.

The morning of the 23rd of May the Expedition crossed the International Boundary line into Canadian territory. The day commenced under entirely new conditions at one in the morning, pulling sleds and shod with our newly acquired snow shoes. A race for the crust, before the sun got a chance to soften it now was the order of the day, until we finally got all our cache safely landed at the final base camp at the head of the Ogilvie Glacier.

At "Turn", out on the glacier, at the junction of the Logan and Ogilvie Glaciers, we finally ended a hard day's work, laterly breaking through the crust for interminable hours. Our direction now changes from one almost east to almost due south, following the Ogilvie Glacier, first on

The ice fall and the end of the Ogilvie glacier , showing the location of Cascade camp, the trail to the Quartz ridge and beyond leading to Observation Camp. The trail is shown on the surface of the snow covered ice and the sleds, one resting,while the other showing some action.



Sledding on the upper reaches of the Ogilvie Glacier just below the site of Cascade Camp.

the 25th. to the "Advance Base Camp" 7 miles up, and then finally to the head of the glacier the following day with the first relay load to "Cascade", the base camp where the climb for the summit commences.

At the "Advance Base Camp" a new lease of life was experienced in coming into possession of all the advantages a well equipped expedition gives, with a total weight of 4700 pounds which provided for a full equipment and stores for a party of ten for 60 working days. The mattresses, robes and tents, seemed supreme luxury and we were temporarily lulled into a belief that the whole affair was comparatively easy. The delusion, however, did not last long,

Up to the 3rd of June, when the party finally left Cascades behind, for the final effort, the party was often separated, the work being divided into explorations to the top of the Cascade, and relaying everything possible from the "A.B.C." Cache up to the "Cascade" (Elev. 7800') base 5 miles above.

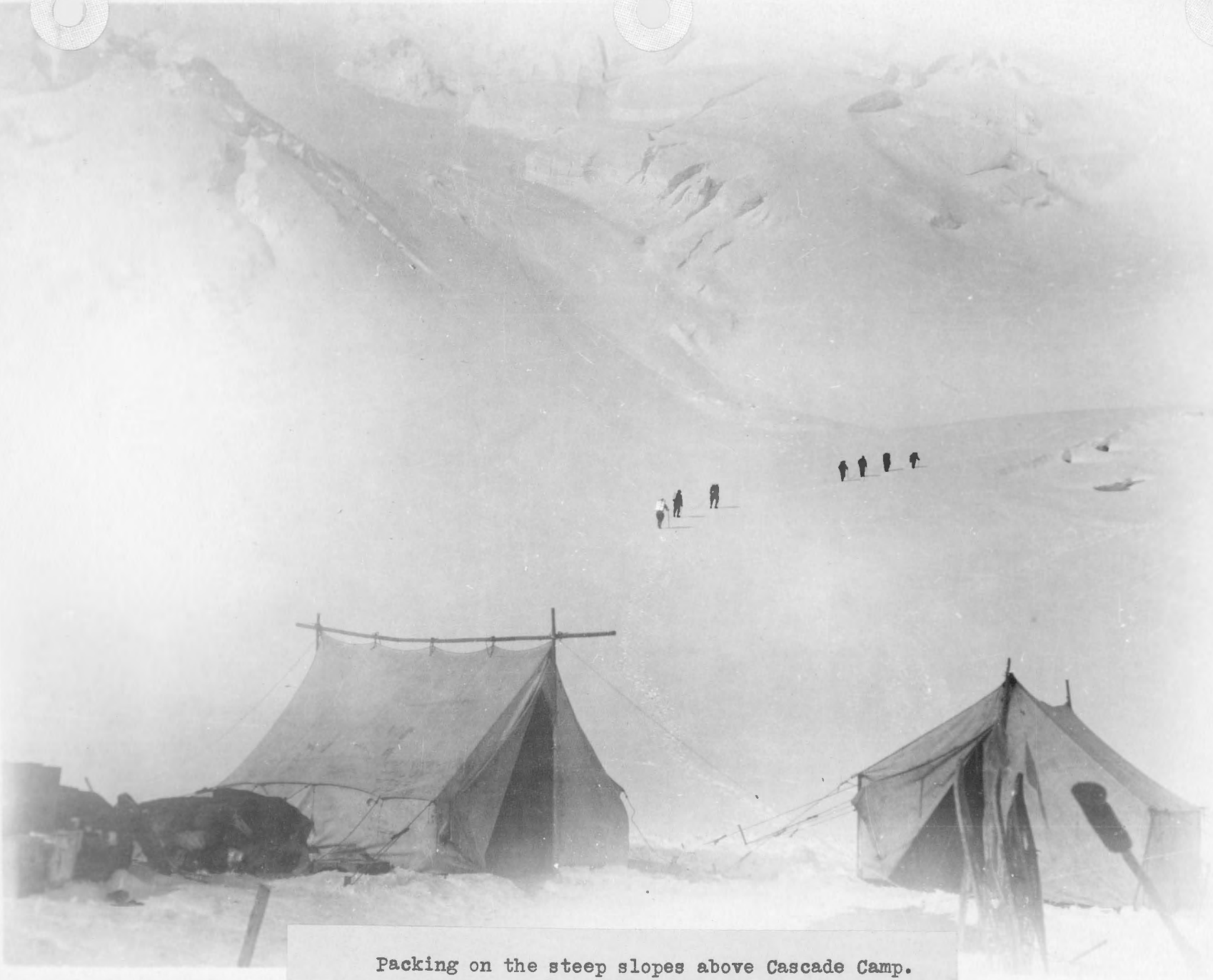
A beautiful bright day crowned our initial efforts in the way of a reconnaisance, when standing on the King Glacier at a point Mr. MacCarthy had called "Observation Point" in 1924, and where he had kept up such a patient vigil without success, a clear view was obtained straight up the King Gorge and to our great joy, the way was clear and no apparent obstructions present themselves. Ever since our first examination of the topographical plan in the early spring of 1924, this one spot on the marked out trail never ceased to be an axiety. The confidence that this new find inspired in our chosen route would be difficult to describe.

On leaving Cascade Camp behind, we had determined on a definite

Avalanche at the base of the ice fall at the Cascades camp. May 26th.

Cascade Camp where the actual climb of Logan commenced. Back of the Camp the ice cascade decending from the King Glacier above. Our elevation here 7800 feet above sea . The last relay left this camp on June 3 , our final return to this camp was on June 28 , that is a period of 26 days actually living on the Logan massif. A dead weight of one ton was lifted from this camp and the summit reached after 20 days making a horizontal distance of about 18 miles and rising 12,000 feet.

One of the early starts from Cascade Camp , relays 1000 feet to Quartz Ridge above L. to R. Hall, Read,Foster, Taylor , Carpe , MacCarthy Morgan.



Packing on the steep slopes above Cascade Camp.

From the summit of "Quartz Ridge" looking down on the surface of the Ogilvie glacier showing the Cascade Camp.

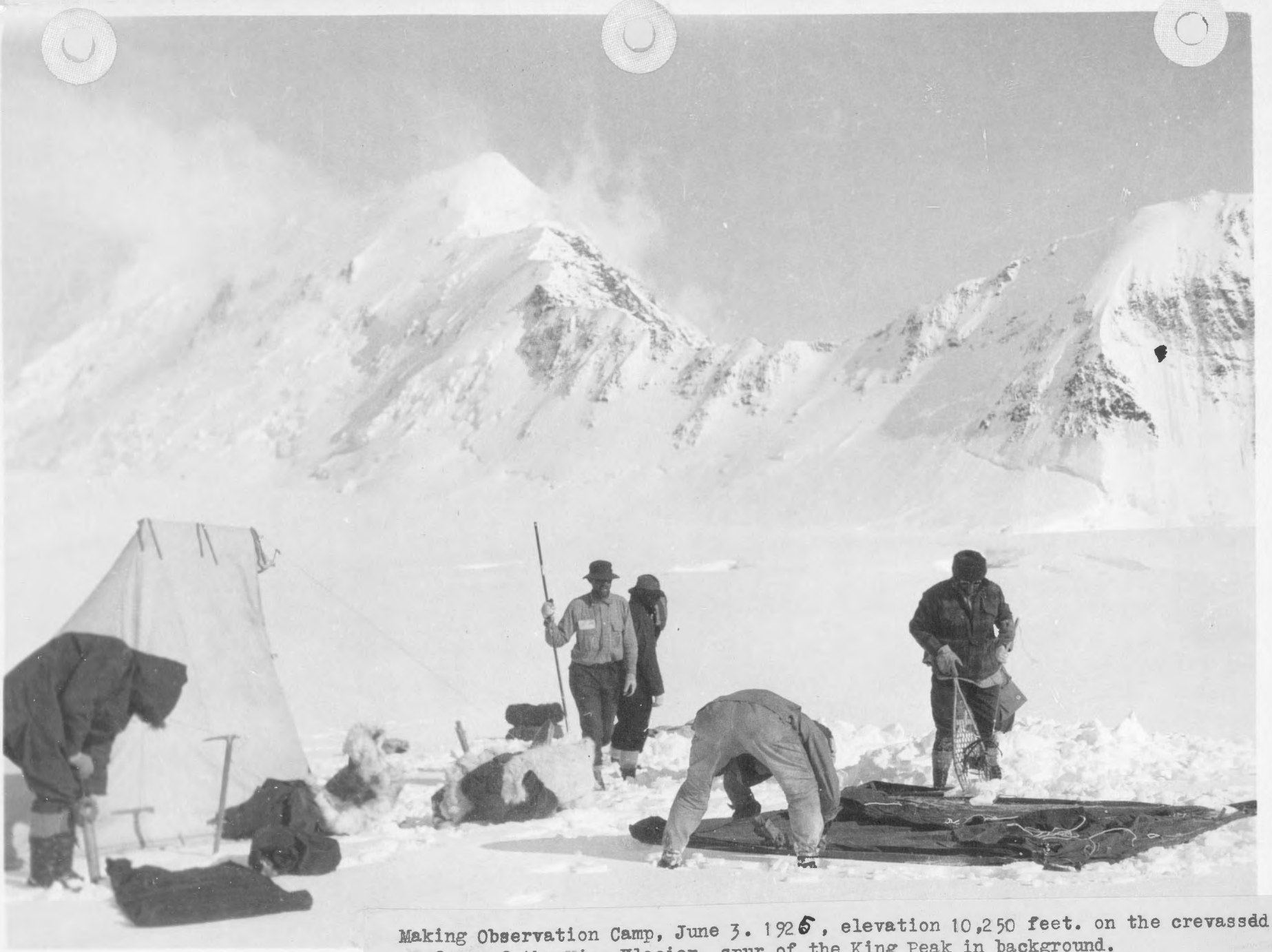
Twenty three hundred feet above the Cascades Camp . A rest on the way to Observation Camp, June 3 rd. The Ogilvie glacier seen below and its junction with the Logan glacier beyond .

ration and equipment allowance which amounted in all to 1875 pounds dead weight, and which had to be taken and consolidated as we went along from camp to camp on our upward journey, by means of a series of back-packing relays. This provided for a hazardous guess of 28 days to take us to the summit and back again, making due allowance for bad weather.

June 6th the King Glacier was explored to within 800 feet of the top, when a stonm drove us back. The next day the try was made again from our now consolidated camp at "Observation Camp" and eminently succeeded, four of the party getting beyond the head of the Glacier, and from an advantage point of 15,000 feet on the summit of a spur descending from King Peak towards the east, and which flanks the border of the trench, they saw for the first time ~~that expansive view of~~ the whole of the St. Elias range, with the great Seward Glacier shimmering at their feet.

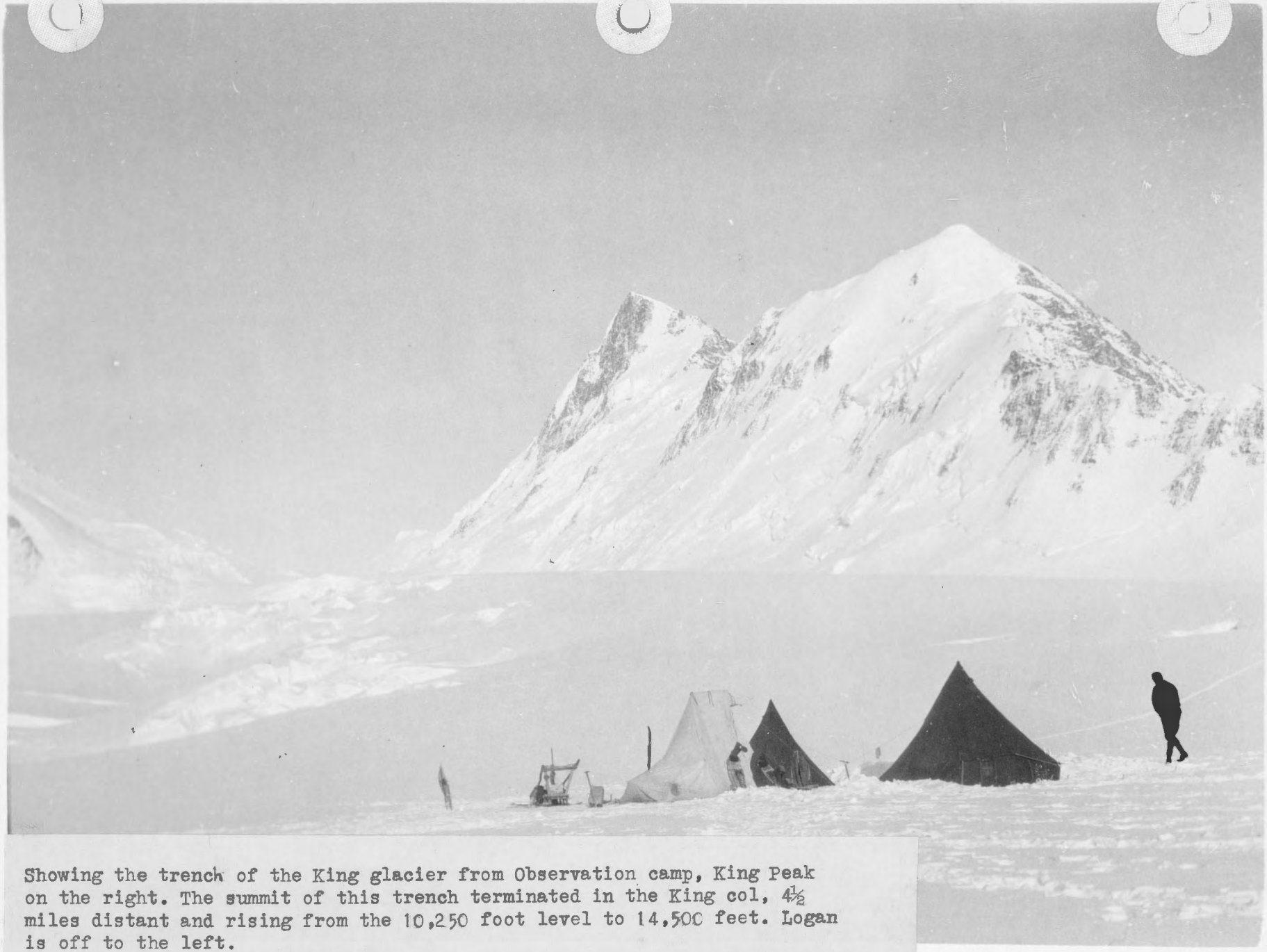
It was the 9th before we were completely consolidated on the summit of the King Col at 14,500 feet, and then our good weather closed down and we were smothered in snow fog and blizzard, until the 14th. Meanwhile, however, we had successfully scouted out our way above, through the ice cataract, which tumbled in a chaotic maze of ice blocks from the upper heights of Logan to the col on its north side, and as well had collected our scattered caches to the site of our camp.

Through the sheer force of a dominating purpose the party forced its way through the deep snow and ice blocks on this morning and got through to "Ice Cliff Camp" some 1700 feet above the col, as the day closed in storm. The 15th the day was impossible and we lay in camp and the next resumed our upward journey with difficulty through worlds of snow, until, finally at 6:30, in the grey dusk, we come to our "Windy Camp" at an elevation of 16,820



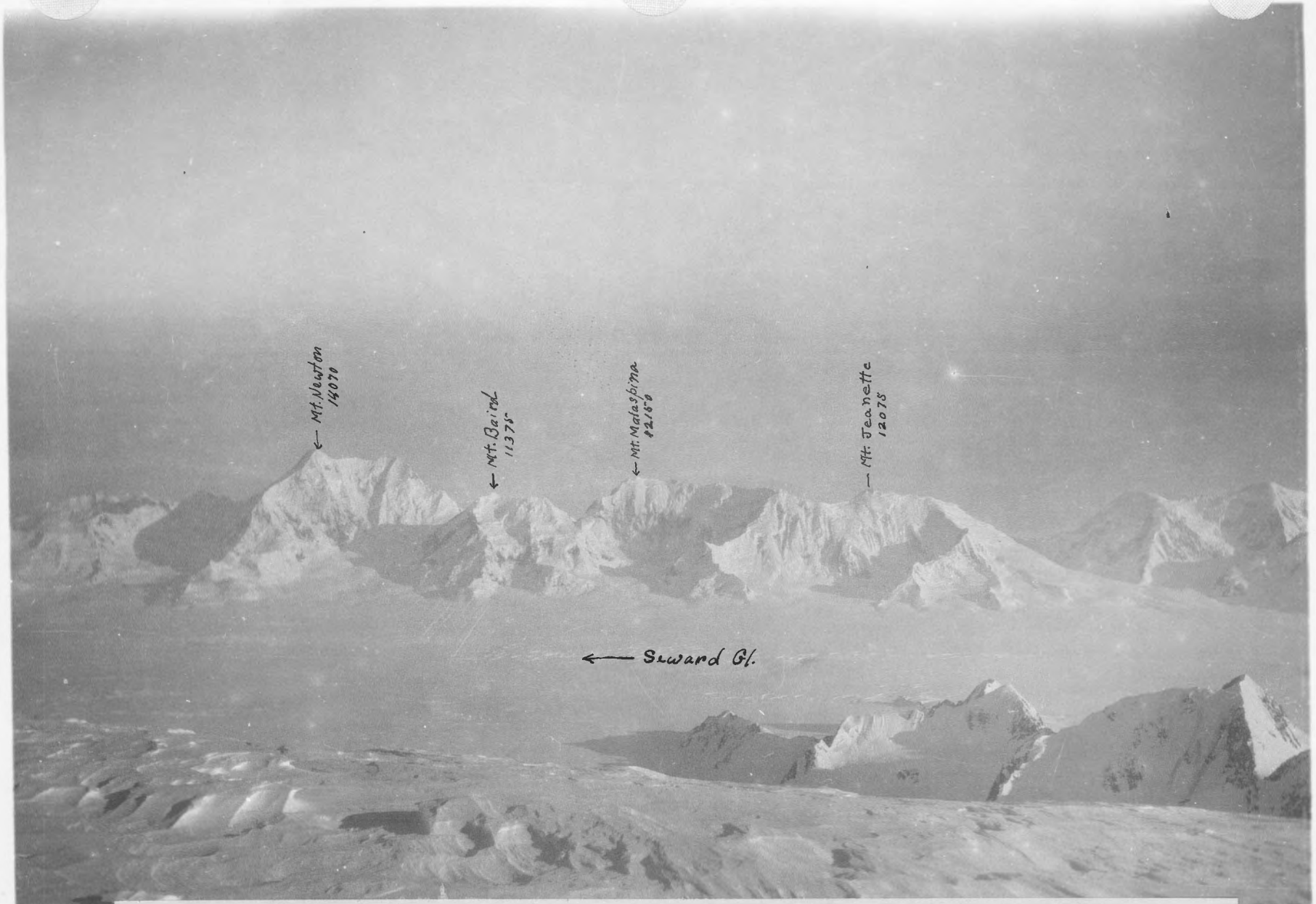
Making Observation Camp, June 3. 1926, elevation 10,250 feet. on the crevassed surface of the King Klacier, spur of the King Peak in background.

Observation Camp at 10,250 feet showing willow trail markers. L.to R. Hall, Read , Foster,Morgan , MacCarthy. Carpe operating motion picture camera.



Showing the trench of the King glacier from Observation camp, King Peak on the right. The summit of this trench terminated in the King col, 4½ miles distant and rising from the 10,250 foot level to 14,500 feet. Logan is off to the left.

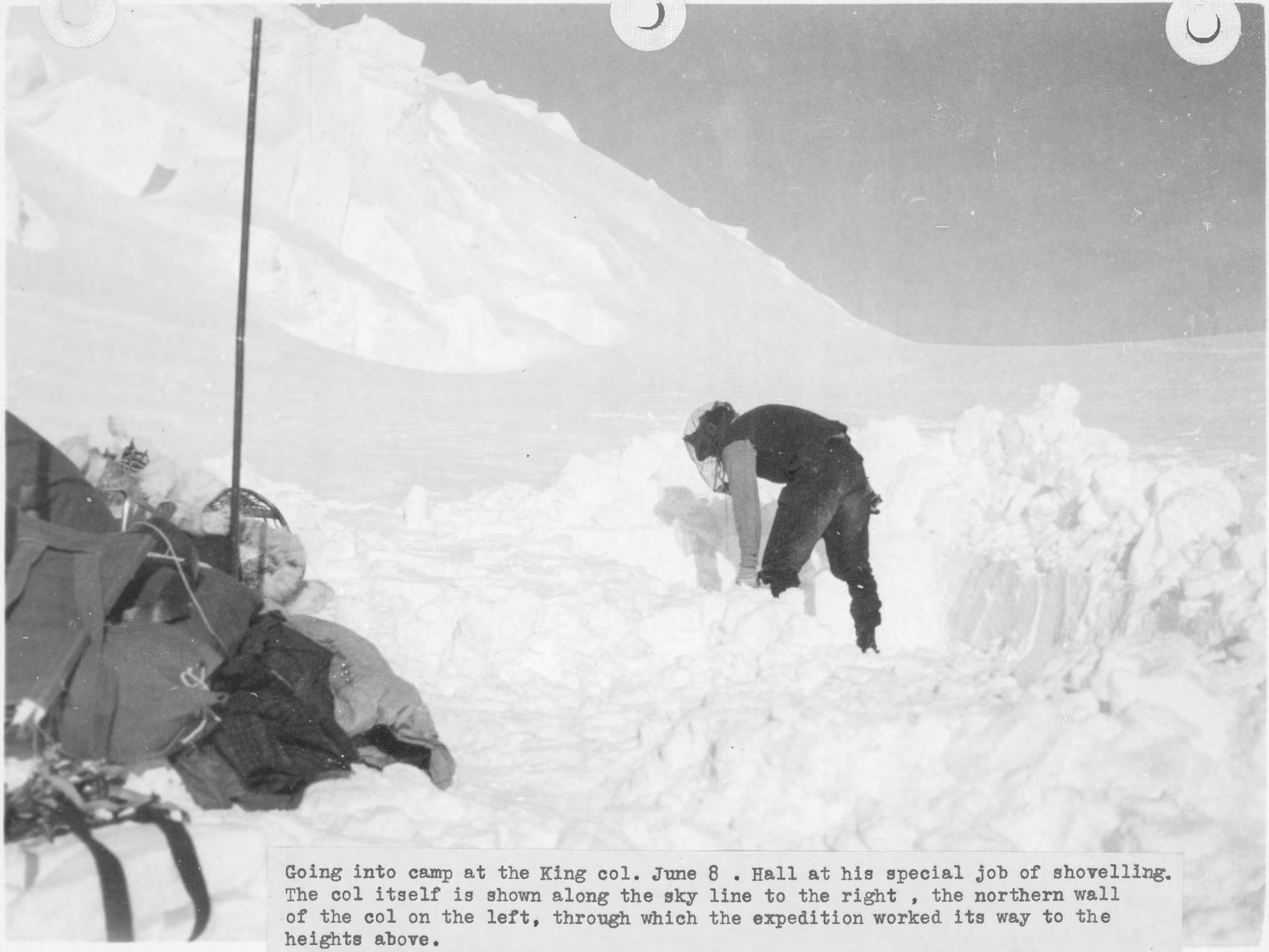
A panprama of King glacier with King Peak rising over 3000 feet above the glacier at this point. The King Col just shows to the extreme left and the long snow ridge above is the outline of the crest of the Eastern Ridge of the King Peak. A view straight down the glacier is seen to the right and on the extreme right the commencement of the ice ramparts of the Logan massif.



A continuation of the last picture . Mt. Augusta left and peaks of this range , terminating in the west by Mt. St. Elias.

Mt. St. Elias as seen from the top of the eastern spur of King Peak at 6 P.M. June 6th. Shows distinctly the Count of the Abruzzi's trail to the summit in 1897 from the Russell Col. The Seward glacier is seen below. In the foreground a spur from King Peak decending to the margin of the Seward glacier. Photograph by R.M.Morgan.

Carpe at the King col. operating the "Filmo" motion picture camera.



Going into camp at the King col. June 8 . Hall at his special job of shovelling. The col itself is shown along the sky line to the right , the northern wall of the col on the left, through which the expedition worked its way to the heights above.

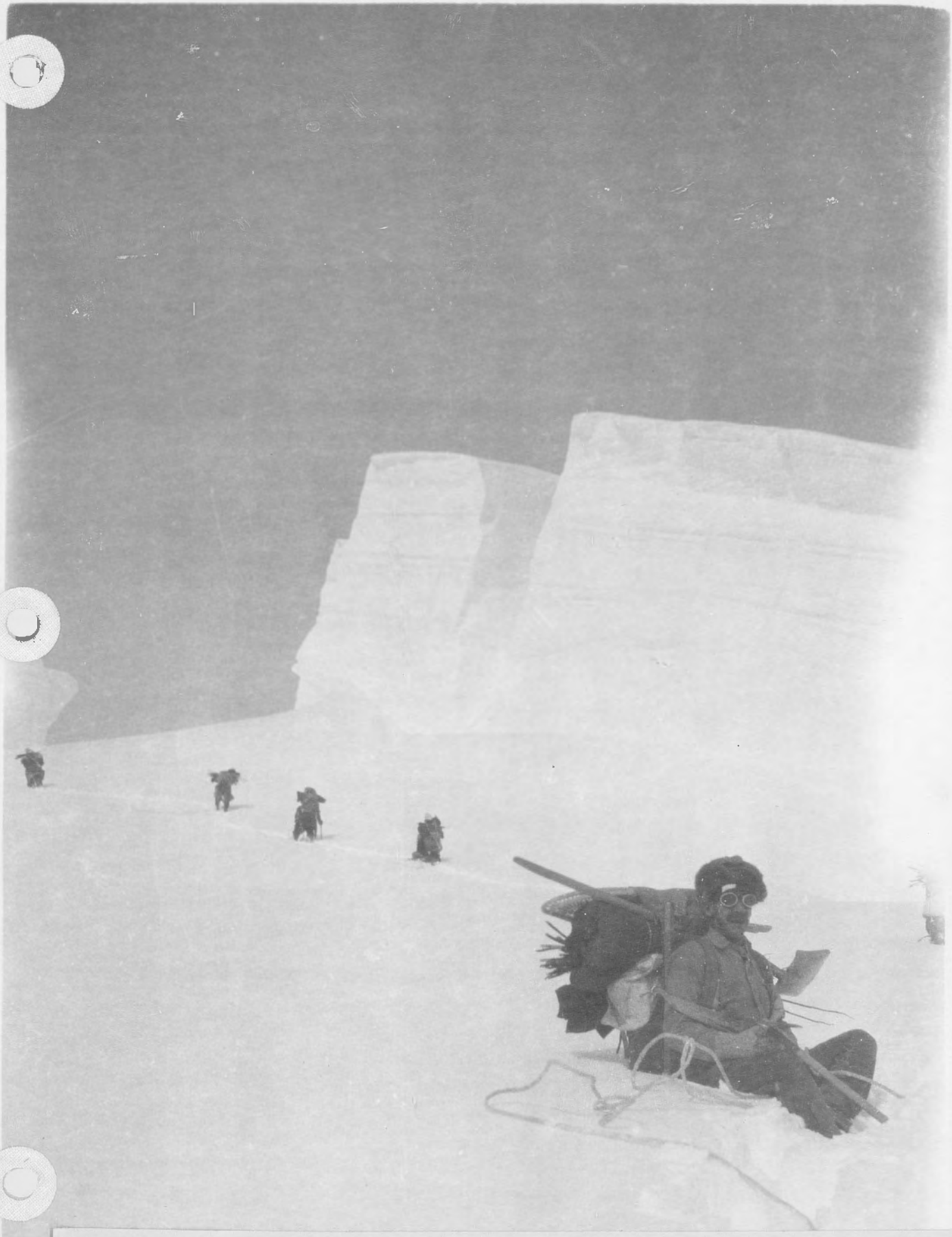
The last relay of provisions and equipment arriving at the King Col camp.
The ice wall leading to the heights above on Logan, in the background.

feet (an altitude obtained by scaled distances and vertical angles on King and St. Elias.

With but a day's supply of food, on the morrow, we all move on up a wide lateral trench, and reach the protruding granite rocks of the summit ramparts. Rest and some food in a wind excavated hollow beneath the cliffs and we are soon again on the move around to the south face of the ramparts, and on a wide snow ridge, blown hard with the wind, we sit in a row in the enveloping fog unable to get a view of a solitary outline of the immensities that surround us. We give up this sort of thing after a long, fruitless wait; some returning to camp, while others still clinging to the hope that the opportunity would be given to see eastward, moved back to our rest hollow, and then beyond, through a gap in the cliffs (later to be our 18,500 foot camp site) to the northern slopes of the summit ice fields, and working out on to a shoulder waited again in vain for some time, hoping for the one glimpse that would have told us everything, as not as yet have we had a single glimpse of our final objective, and are ignorant of what lay between.

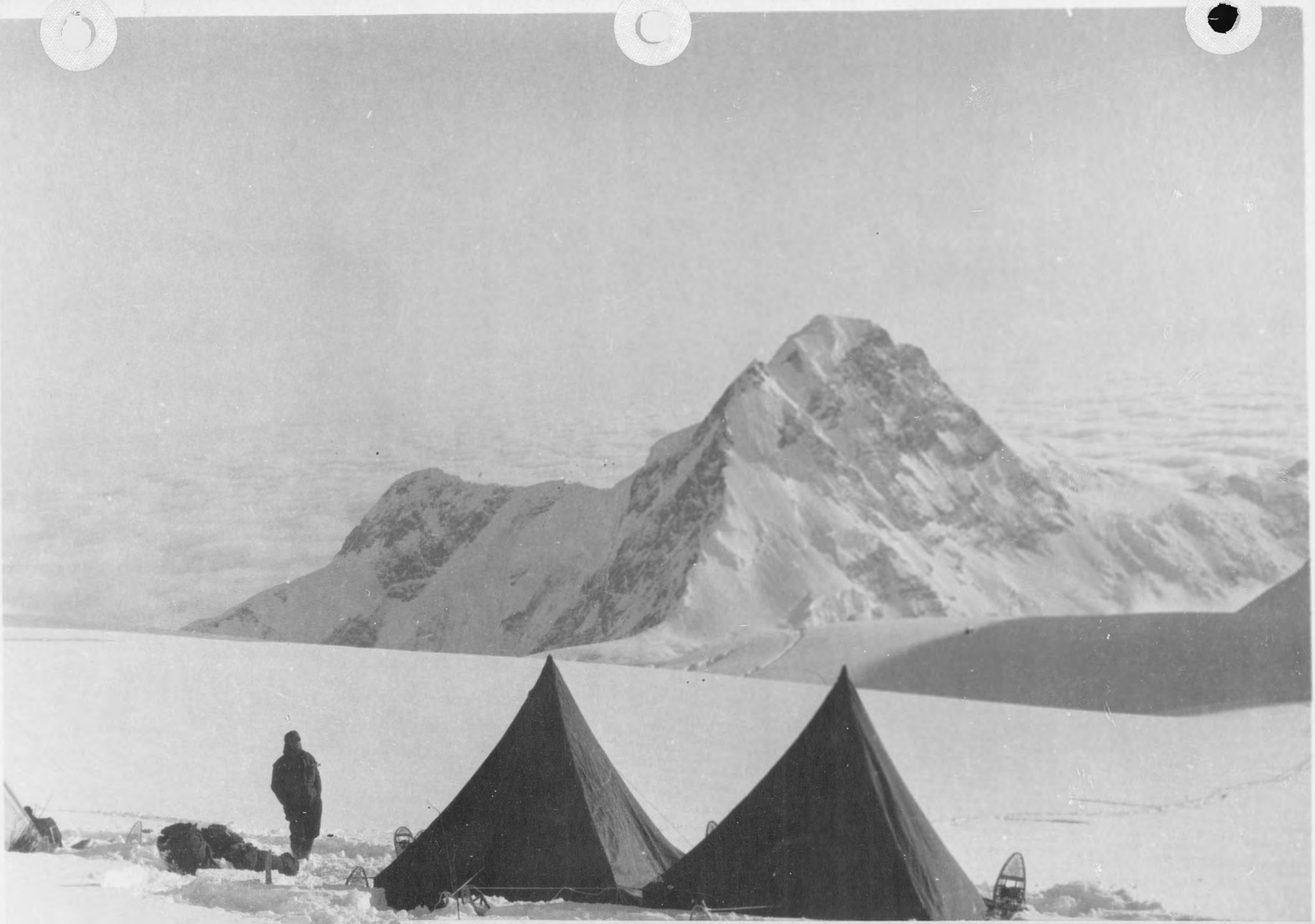
That night at camp a frank discussion makes it clear that the party must be divided on the morrow, five returning to the King Col for food, while three return to the ramparts above and try to determine something of the unknown beyond.

On the 19th the reconnaisance party of the day before meets the party coming up from the King col with the load of supplies, just below the site of the "Ice Cliff Camp" eaven up loads, and start up together. In the storm that was growing in intensity, we, with difficulty, reached "Windy Camp" in the late evening, but not without an episode during the ascent due to frost-bitten feet and a very heavy wind. We were on the point of turning back to



Among the ice blacks on the face of Logan above the king Col. and beyond the MacCarthy Gap. A.M.Taylor.

From the site of "Windy Camp" Elevation above sea 16,800 feet showing Mt. St. Elias (25 miles distant) above the clouds and to the right King Peak (4 miles distant) . The long crest of the eastern ridge is shown projected against the dark background of a northern spur . It was from the eastern end of this ridge that the reconnaisnace party of the 6th of June made its splendid photographs of the whole of the St. Elias range. Valley of the King glacier to right also filled with clouds which constantly roll in from the coast .



A sea of clouds covering the Seward and Columbus glaciers . King Peak and "Windy Camp" in foregrround.

Boundary Survey Photograph of 1913 from "Low[illegible]" by T.C.Dennis , showing the north face of the Logan massif and the trail of the expedition along the summit . Four days and a half were spent on this section of the mountain , it showing only that portion of the trail which is situated on the northern slopes of the massif. Foreground the Logan glacier flowing to the right. The summit of Logan is distant from this point 18 miles.

King Col camp. We now know that if this decision had been made, instead of keeping on, against all odds, it is doubtful if the summit would ever have been made.

On the twentieth, in spite of the storm, a relay of food is taken to the 18,500 foot gorge. The following day we part with Morgan and Hall, who believing it best for all, disappear in a swirl of snow on the back trail following the line of willow markers, back to King Col and finally out. The day actually shows signs of clearing at 3:30 in the afternoon, and with a feeling of uncertainty, yet keeping on about our task, we break up camp and starting on up are very fortunate in reaching the shelter of the granite gorge at 18,500 feet and there finally get up our two tents. Before rolling in that night Andy Taylor actually has a warm meal. The next day, dropping a thousand feet in doing so, we make our way eastward two miles and camp in the open north slopes at the foot of a disappearing ridge, descending from the butte immediately above us.

The following day, the 23rd, being favoured at the start with good weather six finally reach the summit at eight o'clock in the evening, enveloped in fog and just before reaching the top, witnessing that strange phenomenon "The spectre of the Brocken". At 4:30 in the afternoon we had reached the summit of the first peak under bright skies and there had discovered the real summit a mile and a half further (determined by Carpes to be higher) Abney hand level and in order to reach, we had to descend a thousand feet before starting on the final climb.

Twenty-five minutes was spent on the summit and then commenced the retreat and effort to reach camp. Reaching the base of the summit cone, we got to the rocks at the dip between the two peaks and there picked up

Lucania

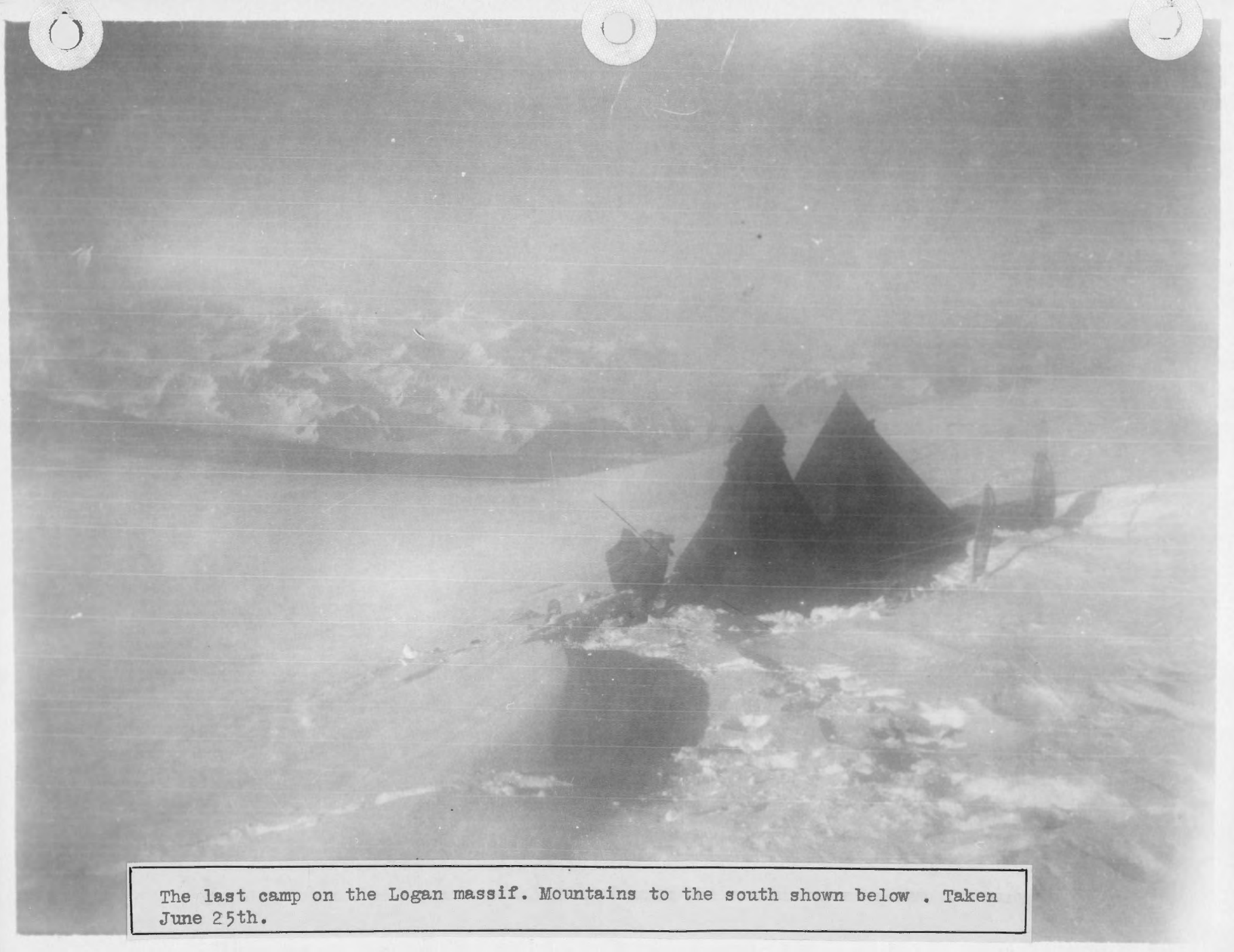
Steel

Walsh

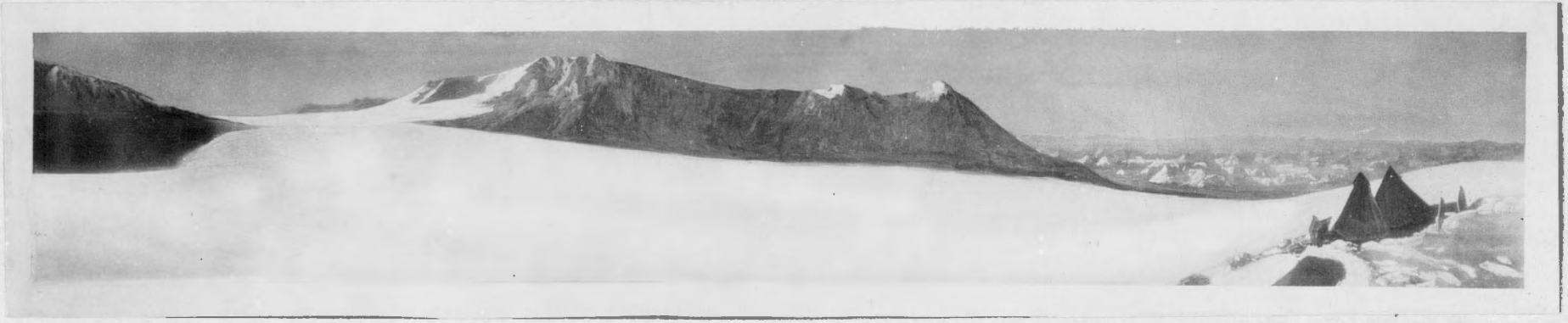
Per W.A. Wood Aug 13/35

From the First Summit (19,800 feet approx.) showing the distant mountains of the Lake Kluane region , entirely unknown and unseen previous to this photograph . The summit of Logan marked . The depression between the two peaks of nearly 1000 feet clearly indicated. Photograph of June 23rd. at 4.30 P.M.

The St.Elias range , Seward and Columbus glaciers , to right the summit of the first peak of Logan. Left the commencement of the slope to the final summit.



The last camp on the Logan massif. Mountains to the south shown below . Taken June 25th.



Panorama at the last camp on the summit of the Logan Massif at 17,500 feet above sea, looking northward. Hurricane ridge is shown to left. Beyond the tents, the distant mountains below, situated just east of the International Boundary line but beyond Lucania . Middle foreground some isolated summits of the Logan massif. Photograph taken June 25 , the second day after the climb . The camp as it stands, was abandoned on the morning of the 26th.

Reaching the summit in storm , the base of the final ascent . The first rope is ahead . The figures showing are Taylor (first) Lambart , and beyond the fear man of the front rope, Foster.

Photograph by Read taken of the party on the actual summit of Mt. Logan at eight O'clock in the evening of the 23rd. of June 1925. Photograph taken looking toward the south . L. to R. Carpe (stooping) Foster , Taylor (front) Lambart , and MacCarthy (front).

what we had left behind. To avoid climbing to the first summit again, to connect up with the old trail, a course was taken as near as could be judged to the right, in an effort to skirt the northern base of this cone and to pick up the trail again on its northwest side. The storm and swirling snow becoming more intense, this we failed to do, and after much floundering above gave up, at about 10:30 P.M. and burrowed into the snow for shelter. A sloping bank facilitated the digging out of kennel like openings, one containing three and one two, and a third Andy had dug for himself. There we spent the night with a low temperature of 12 below zero. The night was calm, however, and snow fell, protecting us in no little way from a worse freezing than we got. The thick weather conditions prevailed all the next day, but realizing that it would be fatal to spend another night in our snow dugouts, we moved out at noon and worked our way first down, and then to the left continuing our general direction, following parallel to the slope, keeping it to our left. Shortly after, Andy Taylor, who was leading, went over an ice edge on to a snow bank and regaining him again, we shortly after picked up a willow. This was a renewed hold on life and with steady progress, we finally made the tents by 6:30 in the evening. Three of the party had lost their way a second time and did not return to camp until 3:30 in the morning.

After a day's rest, one all embracing throught remained uppermost, namely to get off the mountain as speedily as possible. On the 26th we forced ourselves along from early morning until after midnight reaching by then the safety and comfort, so it seemed at the time, of our King Col camp. Climbing to get through the 18,500 foot gap that morning, we all suffered greatly, working our way against a heavy wind and driving snow, suffice it to say that we arrived finally at the protecting lee of the friendly crags.

Back at Cascade Camp, First Aid Station of June 29.Foster,MacCarthy, Lambart.

The return of the Expedition to "Turn" July 1st. Ice column showing ablation or sinking of the whole surface of the glacier during 38 days absence . At this point the ice had been protected by a cache and cover . MacCarthy left , Taylor right.

Two miles below the site of Huhrick's Camp looking up the valley of the Chitina River valley , the glacier terminal moraines showing completely stretching across the valley . Just before the start of the rafts on July 11th . The Chitina River shown in flood running about 8 M.P.H.

On the 28th, another day's hard run until midnight, brought us back and right down to the "Cascades Camp", and there relapsed into several days of unspeakable joys of rest and at intervals giving very needed treatment to our frozen parts.

Our sojourn on the mountain had consisted of 26 days under all possible conditions of storm and cold. Night temperatures were always below freezing and during the day, although the reflection from the sun was great, the snow never was in the state of melting. With the exception of two miles on the summit, the trail was always marked every 100 feet by willow wands of which 1000 were taken.

THE RETURN JOURNEY FROM CASCADES 50 MILES BACK TO HUBRICKS

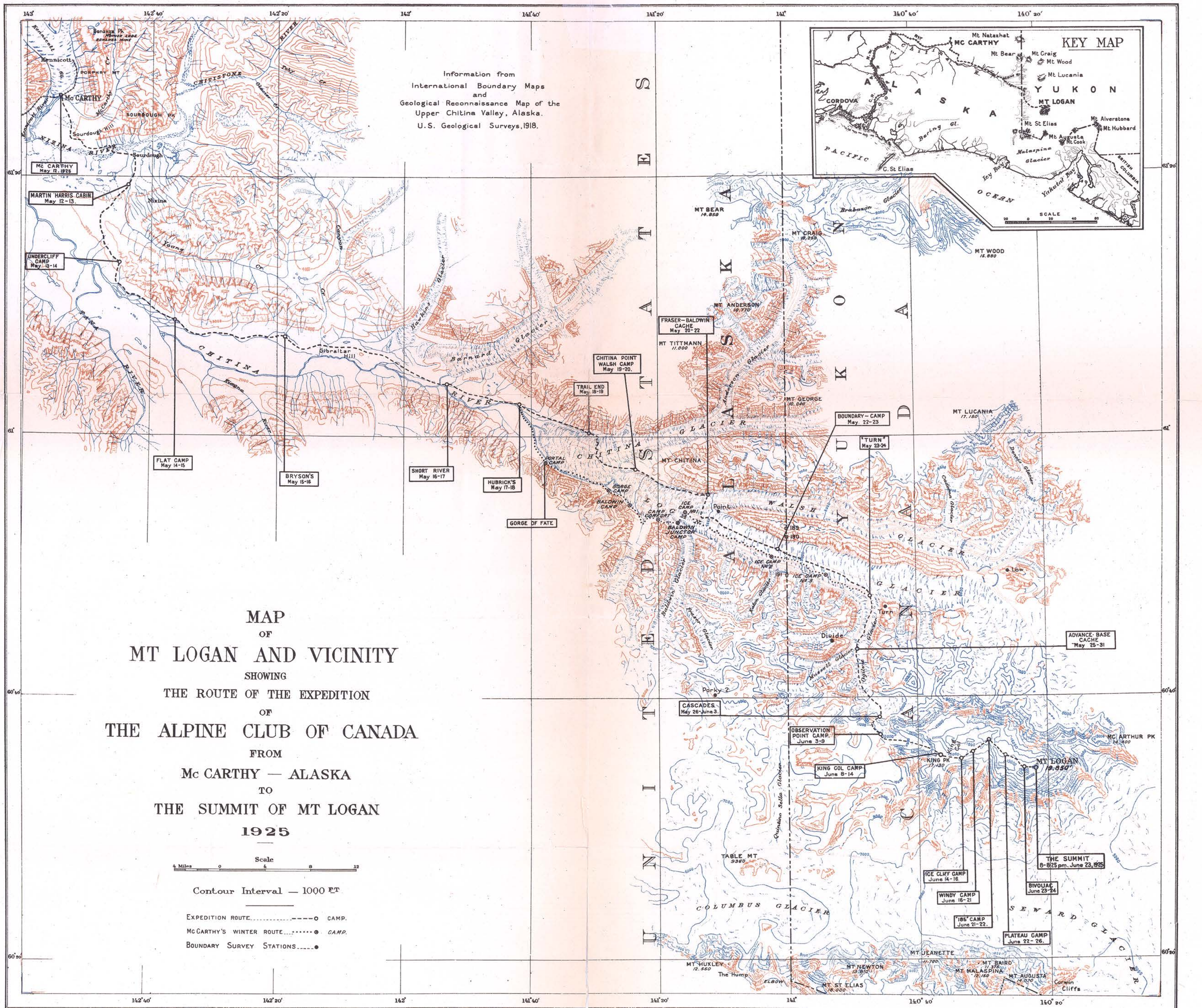
On July 1st we started out on the long 50 mile tramp to Hubrick's, arriving there on the 6th, to find Laing with the news that Hall and Morgan had just left with packs on their backs to walk out the 88 miles to McCarthy.

Abandoning the idea of building boats we resigned our fate to rafts. These were finished on the 10th and on the 11th we started our exciting run down the swift waters of the Chitina River (6 to 9 M. P.H.). At midnight one raft had made 60 miles to "Rush Pond" and its three members the following day walked thirty miles into McCarthy, arriving early on the morning of the 13th. Two days later we got our first news of the other raft when its former three passengers came in. It had capsized 10 miles from the start, and having lost nearly everything, they walked out the entire distance to McCarthy.

The expedition had taken almost to a day two months from McCarthy before its return there again.

END

Map prepared (on a reduced scale of 6 miles to one inch) from the International Boundary Sheet No. 13 and the U. S. Geological Sheet of the Upper Chitina Valley, showing the route taken from McCarthy to the summit . Taken from the Alpine Club of Canada Journal, 1925.


MAP
OF
MT LOGAN AND VICINITY
SHOWING
THE ROUTE OF THE EXPEDITION
OF
THE ALPINE CLUB OF CANADA
FROM
Mc CARTHY — ALASKA
TO
THE SUMMIT OF MT LOGAN
1925
Scale
Contour Interval — 1000 FT
Expedition route ---- CAMP.
McCarthy's winter route ···· CAMP.
Boundary Survey Stations
Information from
International Boundary Maps
and
Geological Reconnaissance Map of the
Upper Chitina Valley, Alaska.
U.S. Geological Surveys, 1918.
KEY MAP
Mt Natazhat
MC CARTHY
Mt Bear
Mt Craig
Mt Wood
Mt Lucania
YUKON
MT LOGAN
ALASKA
CORDOVA
Bering Gl.
Mt St Elias
Mt Alverstone
Mt Hubbard
Mt Augusta
Mt Cook
Malaspina Glacier
PACIFIC
OCEAN
C. St Elias
Icy Bay
Yakutat Bay
BRITISH COLUMBIA
SCALE
Mc CARTHY May 12, 1925
MARTIN HARRIS CABIN May 12-13.
UNDERCLIFF CAMP May 13-14
FLAT CAMP May 14-15
BRYSON'S May 15-16
SHORT RIVER May 16-17
HUBRICK'S May 17-18
GORGE OF FATE
TRAIL END May 18-19
CHITINA POINT WALSH CAMP May 19-20.
FRASER-BALDWIN CACHE May 20-22
BOUNDARY-CAMP May 22-23
"TURN" May 23-24
ADVANCE BASE CACHE May 25-31
CASCADES May 26-June 3.
OBSERVATION POINT CAMP. June 3-9
KING COL CAMP June 8-14
ICE CLIFF CAMP June 14-16.
WINDY CAMP June 16-21
"18⁵" CAMP June 21-22.
PLATEAU CAMP June 22-26.
BIVOUAC June 23-24
THE SUMMIT 8-8.25 pm. June 23, 1925
Kennicott
Bonanza Pk
PORPHYRY MT
CHITISTONE RIVER
SOURDOUGH PK
Sourdough Hill
Sourdough
NIZINA RIVER
Nizina
Young Cr
CHITINA RIVER
Gibraltar Hill
Barnard Glacier
Hawkins Glacier
PORTAL CAMP
GORGE CAMP
BALDWIN CAMP
CAMP COMFORT
ICE CAMP No1
ICE CAMP No2
ICE CAMP No3
BALDWIN JUNCTION CAMP
CHITINA GLACIER
WALSH GLACIER
Point
Turn
Divide
Porky 2
MT BEAR 14,850
MT CRAIG
MT WOOD 15,880
MT ANDERSON 10,770
MT TITTMANN 11,000
MT GEORGE 10,060
MT CHITINA
MT LUCANIA 17,150
Low
KING PK 17,130
MT LOGAN 19,850
MC ARTHUR PK 14,400
TABLE MT 9360
COLUMBUS GLACIER
Quintino Sella Glacier
SEWARD GLACIER
MT JEANETTE
MT HUXLEY 12,560
The Hump
ELBOW
MT NEWTON 13,810
MT ST ELIAS 18,000
MT BAIRD
MT MALASPINA
MT AUGUSTA 14,070
Corwin Cliffs
UNITED STATES
ALASKA
YUKON
CANADA

A P P E N D I C E S

APPENDIX 1.

Preamble

Records of aneroid readings.

METEOROLOGICAL STATIONS.

During the absence of the Expedition from McCarthy , Alaska , (May 12th. to July 13.) daily readings were taken at three points . as follows.

I. At Hubrick's Camp by Mr, Hamilton M.Laing of the Department of Mines Ottawa.

II. At Kennecott (at the Kennecott Copper Mines) by Frank Burnes

III. At McCarthy, Alaska , by Cap. Hubrick .

The readings at the later station being eroneously taken the record at this station has been omitted.

The record of the Short and Mason aneroid now in Washington undergoing tests , under conditions (as nearly as can be reproduced) as they existed on the climb are awaited with interest . Pending these records , the working up of these notes , taken on the climb , have to remain over for inclusion in this report, at a later date.

APPENDIX II.

HUBRICK'S CAMP

BAROMETER AND THERMOMETER READINGS MAY 19 - JULY 6, 1925

Temperature and Barometer (Aneroid) Readings taken at Hubrick's Camp by Hamilton M. Laing

Elevation 2000 feet, 56 miles from the summit of Mt. Logan. Barometer belongs to Mr. Henry S. Hall, Jr. of Boston.

Hubrick's Camp Lat. 61° - 02'
Long. 141° - 40'

1925 Month	Date	Fahren. Temp.	Barometer	Elevation	Time	Weather
May	19	42°	27.5	2600	9.45 A.M.	Rainy
"	"	48	27.2	2550	6;00 P.M.	Cloudy
"	20	40	27.17	2600	7.00 A.M.	Rainy
"	"	48	27.25	2550	7:30 P.M.	Clear
"	21	41	27.4	2375	7:00 A.M.	Cloudy
"	"	44	27.5	2275	8:45 P.M.	Clear
"	22	42	27.62	2175	8:00 A.M.	Cloudy
"	"	44	27.67	2125	9:00 P.M.	Clear
"	23	41	27.72	2075	8:00 A.M.	"
"	"	44	27.7	2075	9:30 P.M.	"
"	24	41	27.72	2075	7:00 A.M.	"
"	"	53	27.65	2150	3:00 P.M.	Hazy
"	"	48	27.6	2200	9:00 P.M.	"
"	25	42	27.6	2200	8:00 A.M.	Rainy
"	"	49	27.55	2225	8:00 P.M.	"
"	26	43	27.6	2200	8:00 A.M.	Light Clouds
"	"	50	27.5	2275	8:45 P.M.	Clear (watch stopped)
"	27	42	27.47	2325	7:00 A.M.	Hazy
"	"	60	27.25	2525	6:30 P.M.	Clear
"	"	53	27.23	2525	9:00 P.M.	"
"	28	48	27.24	2525	7:30 A.M.	Hazy
"	"	64	27.07	2700	7:30 P.M.	Cloudy
"	29	41	27.19	2600	8:30 A.M.	Rainy
"	"	42	27.2	2575	11:00 A.M.	"
"	"	45	27.22	2550	12:00 A.M.	Clearing
"	"	51	27.27	2500	4:00 P.M.	Hazy, clear
"	"	44	27.32	2440	9:30 P.M.	(Sunset) clear
"	"	40			10:00 P.M.	
"	"	38			11:00 P.M.	
"	30	32½			4:00 A.M.	Clear
"	"	42	26.4	2375	8:30 A.M.	"
"	"	47	27.48	2325	9:00 P.M.	Light clouds
"	"	45			10:00 P.M.	
"	31	44	27;5	2275	8:00 A.M.	Cloudy

Month	Date	Fahren. Temp.	Barometer	Elevation	Time	Weather
May	31	52	27.5	2275	12:00 A.M.	Light Clouds
"	"	52	27.47	2325	8:15 P.M.	Light Clouds
"	"	53			10:00 P.M.	Rainy
June	1	48	27,75	2325	7:45 A.M.	Rainy
"	"	60	27.4	2375	6:00 P.M.	Hazy
"	2	48	27.41	2360	8:00 A.M.	Cloudy
"	"	58	27.42	2375	12:45 P.M.	Clear
"	"	53	27.48	2325	10:10 P.M.	(Sunset)
"	3	44	27.5	2275	7:30 A.M.	Clear
"	"	54	27.54	2250	7:00 P.M.	Cloudy
"	4	40	27.5	2275	7:30 A.M.	Hazy, clear
"	"	52	27.45	2340	8:30 P.M.	" "
"	5	42	27.61	2175	6:00 A.M.	Clear
"	"	56	27.60	2190	5:30 P.M.	"
"	"	46	27.61	2180	10:00 P.M.	"
"	6	35	27.69	2125	8:00 A.M.	"
"	"	53	27,65	2140	12.45 P.M.	"
"	"	64	27.60	2190	6:00 P.M.	"
"	"	52	27.58	2200	10.00 P.M.	(Sunset) clear
"	7	38	27,64	2150	6:30 A.M.	Clear
"	"	59	27.60	2190	9:00 P.M.	"
"	8	44	27,62	2175	8:00 A.M.	"
"	"	70	27.55	2240	3:30 P.M.	"
"	"	56			10:00 P.M.	"
"	9	42	27,52	2230	5:00 P.M.	"
"	"	44			7 :00 A.M.	"
"	"	70	27.48	2300	6:00 P.M.	"
"	10	51	27.49	2300	7:00 A.M.	Light Clouds
"	"	66	27.44	2340	12:00 A.M.	"
"	"	72	27.37	2525	3:45 P.M.	Clear
"	"	67	27.33	2450	7:45 P.M.	Light Clouds
"	11	53	27,36	2430	4:45 A.M.	"
"	"	64	27.37	2400	1:30 P.M.	"
"	"	62	27.39	2390	6:00 P.M.	"
"	12	58			4:00 A.M.	Cloudy
"	"	59	27.55	2240	7:00 A.M.	"
"	"	49	27.60	2180	12:45 P.M.	Rainy
"	"	48	27.67	2130	10:00 P.M.	"
"	13	45	27,75	2040	8:00 A M.	"
"	"	55	27,75	2040	1:45 P.M.	Clearing
"	"	57	27.62	2160	9:15 P.M.	Clear
"	14	44	27.60	2180	4:45 A.M.	"
"	"	68	27.45	2340	3:00 P.M.	"
"	"	60	27.37	2425	6:45 P.M.	Light Clouds
"	"	57	27.33	2430	9:15 P.M.	"
"	15	47	27.30	2460	6:30 A.M.	Cloudy
"	"	61	27.30	2460	3:30 P.M.	Clear
"	"	57	27.32	2450	8:45 P.M.	"

Month	Date	Fahren. Temp.	Barometer	Elevation	Time	Weather
June	16	46	27,46	2330	7:00 A.M.	Cloudy
"	"	56	27.50	2290	3:30 P.M.	Light Clouds
"	"	54	27.50	2290	7:00 P.M.	"
"	"	48	27.50	2290	10:00 P.M.	"
"	17	39	27,47	2425	6:30 A.M.	"
"	"	58	27,37	2400	1:30 P.M.	"
"	"	48			10:00 P.M.	"
"	18	43			4:00 A.M.	Rainy
"	"	41	27,45	2340	7:30 A.M.	"
"	"	49	27.53	2240	1:30 P.M.	Clearing, windy
"	"	56	27.55	2230	5:00 P.M.	Light clouds and Sun
"	"	49	27.60	2190	10:15 P.M.	(Sunset) Light clouds
"	19	40	27.66	2140	6:30 A.M.	Light clouds
"	"	56	27.66	2140	1:00 P.M.	Clear
"	"	55	27.60	2190	10:00 P.M.	Cloudy (Light)
"	20	47	27.73	2060	6:30 A.M.	Cloudy
"	"	52	27.83	1975	4:00 P.M.	"
"	21	46	27.87	1940	6:00 A.M.	"
"	"	62	27,76	2040	4:15 P.M.	Clear
"	"	57	27.73	2090	10:30 P.M.	(Sunset) Clear
"	22	43	27,74	2080	7:30 A.M.	Clear
"	"	68	27.70	2100	3:00 P.M.	"
"	"	63	27.70	2100	10:00 P.M.	"
"	23	45	27.77	2040	7:00 A.M.	"
"	"	61	27.79	2025	5:30 P.M.	Rainy
"	24	47	27.90	1900	6:30 A.M.	Cloudy
"	"	58	27.96	1850	3:00 P.M.	"
"	25	47	28.20	1790	7:00 A.M.	"
"	"	59	27.96	1850	12:00 A.M.	Clear
"	26	45	27,62	2160	5:00 A.M.	"
"	"	68	27.40	2390	6:00 P.M.	Cloudy
"	"	55	27.43	2350	9:15 P.M.	Raining
"	27	45	27.36	2425	7:00 A.M.	Cloudy (rained all night
"	"	50	27.33	2440	12:00 A.M.	Cloudy
"	"	53	27.40	2460	7:00 A.M.	"
"	28	45	27.30	2470	6;45 A.M.	"
"	"	55	27.30	2470	6:00 P.M.	Light clouds
"	29	46	27.25	2525	7:30 A.M.	Cloudy, time 1½ hours back
"	"	59	27.30	2470	1:45 P.M.	Light clouds
"	"	51	27.41	2360	8:30 P.M.	Cloudy
"	30	47	27.50	2260	6:00 A.M.	"
"	"	53	27.64	2150	3:45 P.M.	"

Month	Date	Fahren. Temp.	Barometer	Elevation	Time	Weather
July	1	45	27.77	2030	8:30 A.M.	Raining
"	"	52	27.78	2000	8:00 P.M.	Clear
"	2	44	27.77	2040	6:30 A.M.	" Few light clouds
"	"	64	27.63	2160	6:00 P.M.	Clear
"	"	49	27.60	2200	10:00 P.M.	"
"	3	44	27.66	2130	4:00 A.M.	"
"	"	50	27.66	2130	7:00 A.M.	"
"	"	66	27.62	2175	2:00 P.M.	"
"	"	58	27.64	2150	8:30 P.M.	"
"	4	44			4:00 A.M.	Light Clouds
"	"	51	27,75	2050	6:45 A.M.	"
"	"	65	27.70	2100	6:00P M.	Clear
"	"	58	27.70	2100	9:30 P.M.	"
"	5	48	27.78	2030	4:00 A.M.	"
"	"	68	27.78	2030	1:45 P.M.	"
"	"	65	27.75	2025	8:30 P.M.	"
"	6	47	27184	1975	5:00 A.M.	"
"	"	51	27.84	1975	6:30 A.M.	Hazy, clear
"	"	75			3:00 P.M.	Clear
"	"	58			10:00 P.M.	Clear

Aneroid belonging to H. S. Hall and taken with him when he and Morgan left A.M. of July 6th, 1925.

APPENDIX II.

KENNECOTT, ALASKA

Log of Barometer and Thermometer Readings, May 12th to July 13, 1925.

Taken by Frank Burns of the Kennecott Copper Mines.

This station 125 miles from the Summit of Mount Logan in a straight line.

Elevation 2003 feet
Lat. 61° - 29'
Long. 142° - 53'

(Barometer belongs to H. J. Lambart, calliberted by the Physical Testing Laboratory at Ottawa)

1925 Date	Time	Mercury	Feet	Temp.	Temperature Maximum	Minimum
May 12	8.00 A.M.	27.84	29.11	42		
	Noon	27.80	2960	49	50	40
	8.00 P.M.	27.79	2970	42		
May 13	8.00 A.M.	27.85	2910	44		
	Noon	27.84	2900	49½	51	36
	8.00 P.M.	27.90	2870	41		
May 14	8.00 A.M.	27.94	2820	43		
	Noon	27.92	2850	50	54	37
	8.00 P.M.	27.97	2800	42		
May 15	8.00 A.M.	28.09	2680	43		
	Noon	28.11	2660	49	57	38
	8.00 P.M.	28.10	2660	46		
May 16	8.00 A.M.	28.05	2720	41		
	Noon	28.01	2750	41	52	38
	8.00 P.M.	27.95	2820	40		
May 17	8.00 A.M.	27.90	2860	47		
	Noon	27.88	2880	52	54	34
	8.00 P.M.	27.84	2910	45		
May 18	8.00 A.M.	27.81	2955	39		
	Noon	27.70	3060	52	55	35
	8.00 P.M.	27.50	3260	42		
May 19	8.00 A.M.	27.49	3270	38		
	Noon	27.51	3230	41	54	36
	8.00 P.M.	27.55	3210	41		
May 20	8.00 A.M.	27.51	3240	39		
	Noon	27.54	3230	54	56	34
	8.00 P.M.	27.60	3160	45		
May 21	8.00 A.M.	27.77	3000	44		
	Noon	27.80	2970	46	51	36
	8.00 P.M.	27.84	2930	48		
May 22	8.00 A.M.	27.94	2830	43		
	Noon	27.95	2819	47	54	34
	8.00 P.M.	27.96	2800	40		

1925 Date	Time	Mercury	Feet	Temp.	Temperature Maximum	Minimum
May 23	8.00 A.M.	28.20	2750	41		
	Noon	28.00	2770	52	55	30
	8.00 P.M.	27.98	2780	45		
May 24	8.00 A.M.	28.03	2740	42		
	Noon	27.98	2780	45	53	31
	8.00 P.M.	27.82	2850	40		
May 25	8.00 A.M.	27.89	2880	45		
	Noon	27.87	2895	51	53	36
	8.00 P.M.	27.85	2920	42		
May 26	8.00 A.M.	27.87	2895	44		
	Noon	27.85	2920	51	54	36
	8.00 P.M.	27.85	2920	51		
May 27	8.00 A.M.	27.78	2998	46		
	Noon	27.70	3060	55	63	33
	8.00 P.M.	27.56	3200	56		
May 28	8.00 A.M.	27.53	3225	50		
	Noon	27.47	3280	62	68	43
	8.00 P.M.	27.40	3350	58		
May 29	8.00 A.M.	27.52	3250	34		
	Noon	27.62	3116	41	64	34
	8.00 P.M.	27.645	3120	40		
May 30	8.00 A.M.	27.20	3020	44		
	Noon	27.50	3010	50	51	35
	8.00 P.M.	27.77	3000	43		
May 31	8.00 A.M.	27.79	2980	48		
	noon	27.77	3000	49	53	37
	8.00 P.M.	27,75	3005	43		
June 1	8.00 A.M.	27.74	3005	50		
	Noon	27.70	3060	53	58	39(range 19)
	8.00 P.M.	27.66	3100	54		
June 2	8.00 A.M.	27.74	3030	43		
	Noon	27.76	3000	52	54	39
	8.00 P.M.	27.77	3000	44		
June 3	8.00 A.M.	27.80	2960	48		
	Noon	27.76	3000	60	61	36
	8.00 P.M.	27.85	2915	41		
June 4	8.00 A.M.	27.79	2980	48		
	Noon	27.80	2950	48	64	35
	8.00 P.M.	27.82	2950	44		
June 5	8.00 A.M.	27.94	2825	43		
	Noon	27.92	2860	51	58	38
	8.00 P.M.	27.92	2860	44		
June 6	8.00 A.M.	27.97	2795	42		
	Noon	27.94	2830	52	60	33
	8.00 P.M.	27.88	2895	50		
June 7	8.00 A.M.	27.89	2865	48		
	Noon	27.89	2865	60	63	35
	8.00 P.M.	27.88	2880	53		

1925

Date	Time	Mercury	Feet	temp.	Temperature Maximum	Minimum
June 8	8.00 A.M.	27.86	2900	48		
	Noon	27.84	2930	66	66	37
	8.00 P.M.	27.82	2950	51		
June 9	8.00 A.M.	27.83	2935	52		
	Noon	27.80	2965	68	69	45
	8.00 P.M.	27.80	2965	50		
June 10	8.00 A.M.	27.77	2999	50		
	Noon	27.70	2960	60	69	48
	8.00 P.M.	27.64	3110	54		
June 11	8.00 A.M.	27.70	3060	52		
	Noon	27.69	3065	61	68	43
	8.00 P.M.	27.81	2960	45		
June 12	8.00 A.M.	27.90	2860	45		
	Noon	27.94	2835	46	60	41
	8.00 P.M.	27.97	2800	43		
June 13	8.00 A.M.	28.05	2720	44		
	Noon	27.94	2800	53	60	44
	8.00 P.M.	27.94	2800	48		
June 14	8.00 A.M.	27.85	2920	46		
	Noon	27.76	3010	62	66	38
	8.00 P.M.	27.65	3110	53		
June 15	8.00 A.M.	27.64	3130	40		
	Noon	27.65	3110	45	65	40
	8.00 P.M.	27.66	3100	45		
June 16	8.00 A.M.	27.78	2970	47		
	Noon	27.80	2955	53	53	43
	8.00 P.M.	27.82	2940	43		
June 17	8.00 A.M.	27.75	3010	42		
	Noon	27.70	3080	52	57	33
	8.00 P.M.	27.69	3090	49		
June 18	8.00 A.M.	27.80	2960	46		
	Noon	27.88	2880	42	55	36
	8.00 P.M.	27.90	2870	45		
June 19	8.00 A.M.	27.85	2810	44		
	Noon	27.85	2810	56	59	34
	8.00 P.M.	27.85	2810	48		
June 20	8.00 A.M.	28.07	2700	39		
	Noon	28.12	2660	49	55	40
	8.00 P.M.	28.14	2630	41		
June 21	8.00 A.M.	28.13	2650	45		
	Noon	28.08	2700	52	55	39
	8.00 P.M.	28.02	2760	47		
June 22	8.00 A.M.	28.02	2760	50		
	Noon	28.02	2760	59	68	40
	8.00 P.M.	28.97	2800	53		
June 23	8.00 A.M.	28.05	2710	57		
	Noon	28.03	2730	59	63	39
	8.00 P.M.	28.09	2690	49		

1925 Date	Time	Mercury	Feet	Temp.	Temperature Maximum	Minimum
June 24	8.00 A.M.	28.21	2570	50		
	Noon	28.22	2560	57	58	43
	8.00 P.M.	28.26	2510	45		
June 25	8.00 A.M.	28.26	2510	45		
	Noon	28.20	2580	57	67	40
	8.00 P.M.	28.50	2620	46		
June 26	8.00 A.M.	27.86	2820	54		
	Noon	27.72	3050	68	79	41
	8.00 P.M.	27.69	3085	57		
June 27	8.00 A.M.	27.69	3080	41		
	Noon	27.67	3100	47	72	37
	8.00 P.M.	27.65	3110	43		
June 28	8.00 A.M.	27.65	3110	43		
	Noon	27.62	3120	48	49	41
	8.00 P.M.	27.64	3115	44		
June 29	8.00 A.M.	27.58	3200	42	58	35
	Noon	27.58	3200	51		
	8.00 P.M.	27.73	3015	45		
June 30	8.00 A.M.	27.87	2905	45	56	40
	Noon	27.89	2880	53		
	8.00 P.M.	27.84	2810	43		
July 1	8.00 A.M.	28.05	2620	41	53	41
	Noon	28.06	2705	53		
	8.00 P.M.	28.06	2705	48		
July 2	8.00 A.M.	28.03	2740	44	63	42
	Noon	27.98	2800	60		
	8.00 P.M.	27.92	2850	49		
July 3	8.00 A.M.	27.96	2800	48	69	37
	Noon	27.94	2840	61		
	8.00 P.M.	27.92	2865	55		
July 4	8.00 A.M.	28.03	2740	47	69	39
	Noon	27.98	2800	67		
	8.00 P.M.					
July 5	8.00 A.M.				68	39
	Noon	28.05	2715	64		
	8.00 P.M.	28.03	2720	52		
July 6	8.00 A.M.	28.08	2700	53	67	41
	Noon	28.05	2715	61		
	8.00 P.M.	27.99	2780	50		
July 7	8.00 A.M.	27,85	2905	53	61	44
	Noon	27.75	3010	46		
	8.00 P.M.	27.63	3130	44		
July 8	8.00 A.M.	27.47	3295	42		
	Noon	27.46	3300	46	49	40
	8.00 P.M.	27.48	3280	42		

1925

Date	Time	Mercury	Feet	Temp.	Temperature Maximum	Temperature Minimum
July 9	8.00 A.M.	27.55	3210	42		
	Noon	27.58	3180	39	56	39
	8.00 P.M.	27.62	3140	45		
July 10	8.00 A.M.	27.65	3110	42		
	Noon	27.63	3130	48	53	39
	8.00 P.M.	27.63	3130	44		
July 11	8.00 A.M.	2764½	3120	39		
	Noon	27.66	3100	48	59	39
	8.00 P.M.	27.70	3060	46		
July 12	8.00 A.M.	27.64	3120	48		
	Noon	27.64	3120	63	66	38
	8.00 P.M.	27.68	3080	45		
July 13	8.00 A.M.	27.75	3005	48		
	Noon					
	8.00P.M.					

COPY-MED

TOPOGRAPHICAL SURVEY OF CANADA

OTTAWA

March 21, 1928.

Noel J. Ogilvie, Esq.,
Director, Geodetic Survey of Canada,
Ottawa.

Sir:

I am in receipt of your letter of the 14th inst. asking for copies of the records taken in conjunction with the Mt. Logan Expedition of 1925. In compliance therewith I beg to enclose two copies of these records, which are complete.

If there is not a complete record in the Logan Report at the Geodetic Survey building, there should be, and I will ask you to file with the report one of these copies.

I am,

Your obedient servant,

(sign.) H. F. Lambart

P.S. I have read the review of the Glamour of British Columbia, Mrs. Howard's book. I had nothing to be ashamed of or afraid of in connection with this person. You cant avoid always such monstrocities. If you would like to have a conformation of this, call up Mr. Butler of the C.N.R. of Mr. Thompson, Chief Publicity agent of the Railway.

H.F.L.

A.

Kennecott Alaska

Elevation above Sea 2003'
Latitude 61° 29'
Longitude 142° 53'
Distance in a straight line from the summit of Mt. Logan 125 miles
Aneroid (belonging to H.P.L.) Stanley, London No. 1455
Physical Testing Laboratory, Ottawa, calibrations April 27,1925 (No.8416) this before the ascent of Mt. Logan. The Aneroid was again calibrated in 1926 showing no appreciable change in performance.

The following records taken by Frank Burns of the Kennecott Mines Co.

1925 Date	Time	Mercury	feet	Temp.	Temperature Maximum	Minimum
May 12	8.00 A.M.	27.84	2911	42		
	Noon	27.80	2960	49	50	40
	8.00 P.M.	27.79	2970	42		
May 13	8.00 A.M.	27.85	2910	44		
	Noon	27.84	2900	49½	51	36
	8.00 P.M.	27.90	2870	41		
May 14	8.00 A.M.	27.94	2820	43		
	Noon	27.92	2850	50	54	37
	8.00 P.M.	27.97	2800	42		
May 15	8.00 A.M.	28.09	2680	43		
	Noon	28.11	2660	49	57	38
	8.00 P.M.	28.10	2660	46		
May 16	8.00 A.M.	28.05	2720	41		
	Noon	28.01	2750	41	52	38
	8.00 P.M.	27.95	2820	40		
May 17	8.00 A.M.	27.90	2860	47		
	Noon	27.88	2880	52	54	34
	8.00 P.M.	27.84	2910	45		
May 18	8.00 A.M.	27.81	2955	39		
	Noon	27.70	3060	52	55	35
	8.00 P.M.	27.50	3260	42		
May 19	8.00 A.M.	27.49	3270	38		
	Noon	27.51	3230	41	54	36
	8.00 P.M.	27.55	3210	41		
May 20	8.00 A.M.	27.51	3240	39		
	Noon	27.54	3230	54	56	34
	8.00 P.M.	27.60	3160	45		
May 21	8.00 A.M.	27.77	3000	44		
	Noon	27.80	2970	46	51	36
	8.00 P.M.	27.84	2930	48		

Date	Time	Mercury	Feet	Temp.	Temperature Maximum	Temperature Minimum
May 22	8.00 A.M.	27.94	2830	43		
	Noon	27.95	2819	47	54	34
	8.00 P.M.	27.96	2800	40		
May 23	8.00 A.M.	28.20	2750	41		
	Noon	28.00	2770	52	55	30
	8.00 P.M.	27.98	2780	45		
May 24	8.00 A.M.	28.03	2740	42		
	Noon	27.98	2780	45	53	31
	8.00 P.M.	27.82	2850	40		
May 25	8.00 A.M.	27.89	2880	45		
	Noon	27.87	2895	51	53	36
	8.00 P.M.	27.85	2920	42		
May 26	8.00 A.M.	27.87	2895	44		
	Noon	27.85	2920	51	54	36
	8.00 P.M.	27.85	2920	51		
May 27	8.00 A.M.	27.78	2998	46		
	Noon	27.70	3060	55	63	33
	8.00 P.M.	27.56	3200	56		
May 28	8.00 A.M.	27.53	3225	50		
	Noon	27.47	3280	62	68	43
	8.00 P.M.	27.40	3350	58		
May 29	8.00 A.M.	27.52	3250	34		
	Noon	27.62	3116	41	64	34
	8.00 P.M.	27.645	3120	40		
May 30	8.00 A.M.	27.20	3020	44		
	Noon	27.50	3010	50	51	35
	8.00 P.M.	27.77	3000	43		
May 31	8.00 A.M.	27.79	2980	48		
	Noon	27.77	3000	49	53	37
	8.00 P.M.	27.75	3005	43		
June 1	8.00 A.M.	27.74	3005	50		
	Noon	27.70	3060	53	58	39
	8.00 P.M.	27.66	3100	54		(range 19)
June 2	8.00 A.M.	27.74	3030	43		
	Noon	27.76	3000	52	54	39
	8.00 P.M.	27.77	3000	44		
June 3	8.00 A.M.	27.80	2960	48		
	Noon	27.76	3000	60	61	36
	8.00 P.M.	27.85	2915	41		

1925 Date	Time	Mercury	Feet	Temp.	Temperature Maximum	Minimum
June 4	8.00 A.M.	27.79	2980	48		
	Noon	27.80	2950	48	64	35
	8.00 P.M.	27.82	2950	44		
June 5	8.00 A.M.	27.94	2825	43		
	Noon	27.92	2860	51	58	37
	8.00 P.M.	27.92	2860	44		
June 6	8.00 A.M.	27.97	2795	42		
	Noon	27.94	2830	52	60	33
	8.00 P.M.	27.88	2895	50		
June 7	8.00 A.M.	27.89	2865	48		
	Noon	27.89	2865	60	63	35
	8.00 P.M.	27.88	2880	53		
June 8	8.00 A.M.	27.86	2900	48		
	Noon	27.84	2930	66	66	37
	8.00 P.M.	27.82	2950	51		
June 9	8.00 A.M.	27.83	2935	52		
	Noon	27.80	2965	68	69	45
	8.00 P.M.	27.80	2965	50		
June 10	8.00 A.M.	27.77	2999	50		
	Noon	27.70	2960	60	69	48
	8.00 P.M.	27.64	3110	54		
June 11	8.00 A.M.	27.70	3060	52		
	Noon	27.69	3065	61	68	43
	8.00 P.M.	27.81	2960	45		
June 12	8.00 A.M.	27.90	2860	45		
	Noon	27.94	2835	46	60	41
	8.00 P.M.	27.97	2800	43		
June 13	8.00 A.M.	28.05	2720	44		
	Noon	27.94	2800	53	60	44
	8.00 P.M.	27.94	2800	48		
June 14	8.00 A.M.	27.85	2920	46		
	Noon	27.76	3010	62	66	38
	8.00 P.M.	27.65	3110	53		
June 15	8.00 A.M.	27.64	3120	40		
	Noon	27.65	3110	45	65	40
	8.00 P.M.	27.66	3100	45		
June 16	8.00 A.M.	27.78	2970	47		
	Noon	27.80	2955	53	53	43
	8.00 P.M.	27.82	2940	43		
June 17	8.00 A.M.	27.75	3010	42		
	Noon	27.70	3080	52	57	33
	8.00 P.M.	27.69	3090	49		

1925 Date	Time	Mercury	Feet	Temp.	Temperature Maximum	Minimum
June 18	8.00 A.M.	27.80	2960	46		
	Noon	27.88	2880	42	55	36
	8.00 P.M.	27.90	2870	45		
June 19	8.00 A.M.	27.85	2810	44		
	Noon	27.85	2810	56	59	34
	8.00 P.M.	27.85	2810	48		
June 20	8.00 A.M.	28.07	2700	39		
	Noon	28.12	2660	49	55	40
	8.00 P.M.	28.14	2630	41		
June 21	8.00 A.M.	28.13	2650	45		
	Noon	28.08	2700	52	55	39
	8.00 P.M.	28.02	2760	47		
June 22	8.00 A.M.	28.02	2760	50		
	Noon	28.02	2760	59	68	40
	8.00 P.M.	27.97	2800	53		
June 23	8.00 A.M.	28.05	2710	57		
	Noon	28.03	2730	59	63	39
	8.00 P.M.	28.09	2690	49		
June 24	8.00 A.M.	28.21	2570	50		
	Noon	28.22	2560	57	58	43
	8.00 P.M.	28.26	2510	45		
June 25	8.00 A.M.	28.26	2510	45		
	Noon	28.20	2560	57	67	40
	8.00 P.M.	28.50	2620	46		
June 26	8.00 A.M.	27.86	2820	54		
	Noon	27.72	3050	68	79	41
	8.00 P.M.	27.69	3085	57		
June 27	8.00 A.M.	27.69	3080	41		
	Noon	27.67	3100	47	72	37
	8.00 P.M.	27.65	3110	43		
June 28	8.00 A.M.	27.65	3110	43		
	Noon	27.62	3120	48	49	41
	8.00 P.M.	27.64	3115	44		
June 29	8.00 A.M.	27.58	3200	42		
	Noon	27.58	3200	51	58	35
	8.00 P.M.	27.73	3015	45		
June 30	8.00 A.M.	27.87	2905	45		
	Noon	27.89	2880	53	56	40
	8.00 P.M.	27.84	2810	43		

1925 Date	Time	Mercury	Feet	Temp.	Temperature Maximum	Minimum
July 1	8.00 A.M.	28.05	2620	41		
	Noon	28.06	2705	53	53	41
	8.00 P.M.	28.06	2705	48		
July 2	8.00 A.M.	28.03	2740	44		
	Noon	27.98	2800	60	63	42
	8.00 P.M.	27.92	2850	49		
July 3	8.00 A.M.	27.96	2800	48		
	Noon	27.94	2840	61	69	37
	8.00 P.M.	27.92	2865	55		
July 4	8.00 A.M.	28.03	2740	47		
	Noon	27.98	2800	67	69	39
	P.M.					
July 5	8.00 A.M.					
	Noon	28.05	2715	64	68	39
	8.00 P.M.	28.03	2720	52		
July 6	8.00 A.M.	28.08	2700	53		
	Noon	28.05	2715	61	67	41
	8.00 P.M.	27.99	2780	50		
July 7	8.00 A.M.	27.85	2905	53		
	Noon	27.75	3010	46	61	44
	8.00 P.M.	27.63	3130	44		
July 8	8.00 A.M.	27.47	3295	42		
	Noon	27.46	3300	46	49	40
	8.00 P.M.	27.48	3280	42		
July 9	8.00 A.M.	27.55	3210	42		
	Noon	27.58	3180	39	56	39
	8.00 P.M.	27.62	3140	45		
July 10	8.00 A.M.	27.65	3110	42		
	Noon	27.63	3130	48	53	39
	8.00 P.M.	27.63	3130	44		
July 11	8.00 A.M.	27.64½	3120	39		
	Noon	27.66	3100	48	59	39
	8.00 P.M.	27.70	3060	46		
July 12	8.00 A.M.	27.64	3120	48		
	Noon	27.64	3120	63	66	38
	8.00 P.M.	27.68	3080	45		
July 13	8.00 A.M.	27.75	3005	48		

B

MCCARTHY ALASKA

Elevation above sea about 1500 feet
Latitude 61° - 26'
Longitude 142° - 56'
Distance in a straight line from the summit of Mt. Logan about 125 m.
This station seven miles from Kennecott.
Barometer the property of Mr. Allen Carpe of New York, its performance unknown.
The following records by Captain J. P. Hubrick of McCarthy.
Cannot be entirely relied upon.

1925 Date	Time	Aneroid inches of mercury	Barometer feet	Temp.	Fahrenheit Maximum	Thermomet Minimum
May 10	8.45 A.M.	28.54	2240	53		
	Noon	28.46	2320	72	73	32
	9.15 P.M.	28.44	2340	53		
May 11	8.00 A.M.	28.42	2375	50		
	Noon	28.36	2420	74	75	39
	9.05 P.M.					
May 12	A.M.		2360	48		
	Noon	28.38	75	75	72	42
	P.M.			60		
May 13	9.45 A.M.	28.50	2344	68		
	Noon			69	74	42
	5.10 P.M.	28.37	2260	60		
May 14	9.15 A.M.	28.42	2300	63		
	Noon			70	73	48
	8.30 P.M.	28.60	2200	43		
May 15	9.00 A.M.	28.70	2100	52		
	Noon	28.70	2100	72	74	54
	9.00 P.M.	28.80	2000	50		
May 16	9.00 A.M.	28.70	2100	45		
	Noon	28.65	2150	55	75	58
	7.00 P.M.	28.55	2250	53		
May 17	8.30 A.M.	28.53	2225	51		
	Noon	27.81	3000	65	72	62
	8.00 P.M.	28.55	2250	48		
May 18	9.00 A.M.	28.40	2400	46		
	Noon	28.30	2500	70	88	26
	8.00 P.M.	28.10	2700	69		
May 19	8.00 A.M.	28.15	2750	46		
	Noon	28.20	2600	60	87	24
	8.00 P.M.	28.25	2650	55		
May 20	9.00 A.M.	28.10	2700	54		
	Noon	28.12	2675	66	72	21
	9.00 P.M.	28.12	2675	53		
May 21	Noon A.P.	28.12 28.25	2675 2650	55 59	84	24

1925 Date	Time	Aneroid inches of mercury	Barometer feet	Temp.	Fahrenheit Thermometer Max.	Min.
May 22	9.00 A.M.	28.52	2250	62		
	Noon	28.55	2250	67	80	24
	8.00 P.M.	28.55	2250	50		
May 23	9.00 A.M.	28.62	2175	55		
	Noon	28.60	2200	69	71	18
	8.00 P.M.	28.60	2200	50		
May 24	A.M.	28.62	2175	50		
	Noon	28.60	2200	59	72	20
	9.00 P.M.	28.52	2275	56		
May 25	8.00 A.M.	28.50	2300	56		
	Noon	28.42	2375	64	73	26
	9.00 P.M.	28.42	2375	49		
May 26	8.00 A.M.	28.50	2220	53		
	Noon	28.42	2375	55	70	23
	7.00 P.M.	28.42	2375	54		
May 27	8.00 A.M.	28.40	2400	59		
	Noon	28.22	2574	75	91	61
	8.00 P.M.	28.26	2550	60		
May 27	8.00 A.M.	28.12	2675	60		
	Noon	28.08	2750	78	96	30
	8.00 P.M.	27.60	2840	64		
May 28	9.00 A.M.	28.10	2700	45		
	Noon	28.20	2600	47	79	27
	9.00 P.M.	28.43	2550	46		
May 29	9.00 A.M.	28.37	2490	53		
	Noon	28.35	2425	57	73	19
	9.00 P.M.	28.40	2400	50		
May 30	8.00 A.M.	28.40	2400	54		
	Noon	28.32	2450	65	76	34
	8.00 P.M.	28.32	2450	46		
May 31	9.00 A.M.	28.32	2450	65		
	Noon	28.27	2535	70	88	27
	9.00 P.M.	28.28	2520	55		
June 1	8.00 A.M.	28.33	2476	53		
	Noon	28.25	2645	68	85	27
	9.00 P.M.	28.30	2600	52		
June 2	8.00 A.M.	28.42	2360	55		
	Noon	28.30	2500	74	91	22
	P.M.	28.42	2375	52		

1925 Date	Time	Aneroid inches of mercury	Barometer feet	Temp.	Fahrenheit Max.	Ther. Min.
June 3	6.00 A.M.	28.40	2400	53		
	Noon	28.30	2500	74	92	22
	P.M.	28.42	2375	58		
June 4	6.00 A.M.	28.20	2600	54		
	Noon	28.30	2500	78	92	20
	P.M.	28.40	2400	52		
June 5	6.00 A.M.	28.50	2300	48		
	Noon	28.50	2300	67	86	27
	P.M.					
June 6	6.00 A.M.	28.53	2225	50		
	Noon	28.50	2300	75	90	20
	P.M.	28.40	2400	54		
June 7	9.00 A.M.	28.50	2300	64		
	Noon	28.50	2300	80	96	22
	9.00 P.M.	28.50	2300	58		
June 8	6.00 A.M.	28.50	2300	58		
	Noon	28.45	2320	77	95	22
	P.M.	28.40	2400	69		
June 9	9.00 A.M.	28.40	2400	73		
	Noon	28.36	2420	84	100	26
	9.00 P.M.	28.36	2420	62		
June 10	9.00 A.M.	28.40	2400	68		
	Noon	28.30	2500	86	98	29
	8.00 P.M.	28.20	2600	69		
June 11	6.00 A.M.	28.22	2573	60		
	Noon	28.32	2480	72	92	34
	8.00 P.M.	28.30	2500	64		
June 12	9.00 A.M.	28.50	2300	56		
	Noon	28.50	2300	59	82	33
	8.00 P.M.	28.52	2275	62		
June 13	6.00 A.M.	28.65	2150	53		
	Noon	28.60	2200	71	88	30
	8.00 P.M.	28.50	2300	58		
June 14	9.00 A.M.	28.50	2300	67		
	Noon	28.32	2430	75	94	26
	8.00 P.M.	28.35	2440	57		
June 15	9.00 A.M.	28.25	2575	50		
	Noon	28.25	2575	56	95	31
	8.00 P.M.	28.28	2525	56		

1925 Date	Time	Aneroid inches of mercury	Barometer feet	Temp.	Fahrenheit Max.	Ther. Min.
June 16	8.00 A.M.	28.40	2400	53		
	Noon	28.40	2400	60	78	26
	8.00 P.M.	28.40	2400	51		
June 17	9.00 A.M.	28.36	2425	63		
	Noon	28.30	2500	67	90	22
	8.00 P.M.	28.30	2500	57		
June 18	9.00 A.M.	28.40	2400	46		
	Noon	28.50	2300	63	83	28
	8.00 P.M.	28.50	2300	58		
June 19	8.00 A.M.	28.40	2200	59		
	Noon	28.60	2250	72	92	20
	8.00 P.M.	28.50	2300	64		
June 20	8.00 A.M.	28.60	2200	48		
	Noon	28.73	2075	59	80	28
	8.00 P.M.	28.73	2075	53		
June 21	9.00 A.M.	28.70	2100	55		
	Noon	28.65	2175	67	93	31
	P.M.					
June 22	9.00 A.M.	28.60	2200	75		
	Noon	28.58	2225	80	97	26
	P.M.					
June 23	9.00 A.M.	28.60	2200	70		
	Noon	28.63	2175	80	98	26
	9.00 P.M.	28.70	2100	68		
June 24	8.00 A.M.	28.80	2000	62	86	32
	Noon	28.80	2000	64		
	8.00 P.M.	28.80	2000	56		
June 25	8.00 A.M.	28.63	2175	54		
	Noon	28.60	2200	70	94	34
	8.00 P.M.	28.60	2200	60		
June 26	8.00 A.M.	28.50	2300	66		
	Noon	28.30	2500	86	100	28
	P.M.	28.30	2500	60		
June 27	8.00 A.M.	28.30	2500	48		
	Noon	28.20	2600	60	78	26
	P.M.	28.20	2600	56		
June 28	9.00 A.M.	28.20	2600	51		
	Noon	28.20	2600	59	80	26
	8.00 P.M.	28.20	2600	52		

1925 Date	Time	Aneroid inches of mercury	Barometer feet	Temp.	Fahrenheit Max.	Ther. Min.
June 29	9.00 A.M.	28.30	2500	48		
	Noon	28.30	2500	58	82	24
	8.00 P.M.	28.30	2500	56		
June 30	8.00 A.M.	28.42	2375	50		
	Noon	28.50	2300	59	82	27
	9.00 P.M.	28.60	2200	53		
July 1	9.00 A.M.	28.60	2200	47		
	Noon	28.60	2200	65	83	32
	9.00 P.M.	28.62	2150	55		
July 2	8.00 A.M.	28.65	2150	48		
	Noon	28.60	2200	79	91	19
	9.00 P.M.	28.50	2300	63		
July 3	8.00 A.M.	28.55	2250	60		
	Noon	28.50	2300	78	94	25
	8.00 P.M.	28.50	2300	59		
July 4	8.00 A.M.	28.60	2200	59		
	Noon	28.60	2200	77	96	26
	P.M.					
July 5	9.00 A.M.	28.75	2125	57		
	Noon	28.60	2200	75	93	30
	8.00 P.M.	28.60	2200	66		
July 6	A.M.	28.75	2125	62		
	Noon	28.60	2200	80	96	29
	9.00 P.M.	28.30	2500	60		
July 7	8.00 A.M.	28.28	2575	60		
	Noon	28.30	2500	58	78	47
	8.00 P.M.	28.30	2500	56		
July 8	8.00 A.M.	28.25	2525	50		
	Noon	28.25	2525	56	78	31
July 9	8.00 A.M.	28.10	2700	51		
	Noon	28.10	2700	55	78	30
	8.00 P.M.	28.20	2600	46		
July 10	8.00 A.M.	28.12	2675	49		
	Noon	28.20	2600	63	82	31
	8.00 P.M.	28.20	2600	46		

1925 Date	Time	Aneroid inches of mercury	Barometer feet	Temp	Fahrenheit Ther. Max.	Min.
July 11	8.00 A.M.	28.20	2600	51		
	Noon	28.20	2600	69	82	29
	8.00 P.M.	28.25	2575	63		
July 12	9.00 A.M.	28.25	2500	64		
	Noon	28.20	2600	78	95	24
	8.00 P.M.	28.20	2600	72		
July 13	9.00 A.M.	28.25	2500	71		
	Noon	28.25	2500	83	99	28
	8.00 P.M.	25.35	2450	67		
July 14	8.00 A.M.	28.50	2300	54		
	Noon	28.60	2200	62	84	30
	8.00 P.M.	28.70	2100	59		
July 15	8.00 A.M.	28.80	2000	48		
	Noon	28.80	2000	67	83	30
	8.00 P.M.	28.70	2100	52		
July 16	8.00 A.M.	28.70	2100	57		
	Noon	28.60	2200	75	92	28
	P.M.					

Aneroid and temperature record kept by Capt. Hubrick at McCarthy May 10, to July 15, 1925.

Aneroid readings not to be relied upon, inches of Hg. read and tenth taken off foot scale.

HUBRICK'S CAMP (TIMBER BASE CAMP AT TOE OF ICE CHITINA GLACIER)

Elevation above sea 2000 feet
Latitude 61° - 02'
Longitude 141° - 40'
Distance in a straight line from the summit of Mt. Logan 56 miles
Barometer the property of Mr. Henry S. Hall of Boston, U.S. its performance unknown
The following records by Hamilton M. Laing, naturalist of the expedition stationed at this point all summer.

1925 Month	Date	Temp	Barometer	Elevation	Time	Weather
May	19	42°	27.5	2600	9.45 A.M.	Rainy
"	"	48	27.2	2550	6.00 P.M.	Cloudy
"	20	40	27.17	2600	7.00 A.M.	Rainy
"	"	48	27.25	2550	7.30 P.M.	Clear
"	21	41	27.4	2375	7.00 A.M.	Cloudy
"	"	44	27.5	2275	8.45 P.M.	Clear
"	22	42	27.62	2175	8.00 A.M.	Cloudy
"	"	44	27.67	2125	9.00 P.M.	Clear
"	23	41	27.72	2075	8.00 A.M.	"
"	"	44	27.7	2075	9.30 P.M.	"
"	24	41	27.72	2075	7.00 A.M.	"
"	"	53	27.65	2150	3.00 P.M.	Hazy
"	"	48	27.6	2200	9.00 P.M.	"
"	25	42	27.6	2200	8.00 A.M.	Rainy
"	"	49	27.55	2225	8.00 P.M.	"
"	26	43	27.6	2200	8.00 A.M.	Light Clouds
"	"	50	27.5	2275	8.45 P.M.	Clear (watch stopped)
"	27	42	27.47	2325	7.00 A.M.	Hazy
"	"	60	27.25	2525	6.30 P.M.	Clear
"	"	53	27.23	2525	9.00 P.M.	"
"	28	48	27.24	2525	7.30 A.M.	Hazy
"	"	54	27.07	2700	7.30 P.M.	Cloudy
"	29	41	27.19	2600	8.30 A.M.	Rainy
"	"	42	27.2	2575	11.00 A.M.	"
"	"	45	27.22	2550	12.00 A.M.	Clearing
"	"	51	27.27	2500	4.00 P.M.	Hazy, clear
"	"	44	27.32	2440	9.30 P.M.	(Sunset) clear
"	"	40			10.00 P.M.	
"	"	38			11.00 P.M.	
"	30	32½			4.00 A.M.	Clear
"	"	42	27.4	2375	8.30 A.M.	"
"	"	47	27.48	2325	9.00 P.M.	Light clouds
"	"	45			10.00 P.M.	
"	31	44	27.5	2275	6.00 A.M.	Cloudy
"	"	52	27.5	2275	12.00 A.M.	Light Clouds
"	"	52	27.47	2325	8.15 P.M.	"
"	"	53			10.00 P.M.	
June	1	48	27.75	2325	7.45 A.M.	Rainy
"	"	60	27.4	2375	6.00 P.M.	Hazy
"	2	48	27.41	2360	8.00 A.M.	Cloudy
"	2	58	27.42	2375	12.45 P.M.	Clear

1925 Month	Date	Temp	Barometer	Elevation	Time	Weather
June	2	53	27.48	2325	10.10	P.M. (sunset)
"	3	44	27.5	2275	7.30	A.M. Clear
"	3	54	27.54	2250	7.00	P.M. Cloudy
"	4	40	27.5	2275	7.30	A.M. Hazy, clear
"	4	52	27.45	2340	8.30	P.M. "
"	5	42	27.61	2175	6.00	A.M. Clear
"	5	56	27.60	2190	5.30	P.M. "
"	5	46	27.61	2180	10.00	P.M. "
"	6	35	27.69	2125	8.00	A.M. "
"	6	53	26.65	2140	12.45	P.M. "
"	6	64	27.60	2190	5.00	P.M. "
"	6	52	27.58	220[illegible]	1[illegible].00	P.M. Sunset clear
"	7	38	27.64	2150	6.30	A.M. Clear
"	7	63	27.30	2110	9.00	P.M. "
"	8	44	27.62	2175	8.00	A.M. "
"	8	70	27.55	2240	3.30	P.M. "
"	8	56			10.00	P.M. "
"	9	42	27.52	2230	5.00	P.M. "
"	9	44			7.00	A.M. "
"	9	70	27.48	2300	6.00	P.M. "
"	10	51	27.49	2300	7.00	A.M. Light clouds
"	10	66	27.44	2340	12.00	A.M. "
"	10	72	27.37	2425	3.45	P.M. Clear
"	10	67	27.33	2450	7.45	P.M. Light clouds
"	11	53	27.36	2430	4.45	A.M. "
"	11	64	27.37	2400	1.30	P.M. "
"	11	62	27.39	2390	6.00	P.M. "
"	12	58			4.00	A.M. Cloudy
"	12	59	27.55	2240	7.00	A.M. "
"	12	49	27.60	2180	12.45	P.M. Rainy
"	12	48	27.67	2130	10.00	P.M. "
"	13	45	27.75	2040	8.00	A.M. "
"	13	55	27.75	2040	1.45	P.M. Clearing
"	13	57	27.62	2160	9.15	P.M. Clear
"	14	44	27.60	2180	4.45	A.M. "
"	14	68	27.45	2340	8.00	P.M. "
"	14	60	27.37	2425	6.45	P.M. Light clouds
"	14	57	27.33	2430	9.15	P.M. "
"	15	47	27.30	2460	6.30	A.M. Cloudy
"	15	61	27.30	2460	3.30	P.M. Clear
"	15	57	27.32	2450	8.45	P.M. "
"	16	46	27.46	2330	7.00	A.M. Cloudy
"	16	56	27.50	2290	3.30	P.M. Light clouds
"	16	54	27.50	2290	7.00	P.M. "
"	16	48	27.50	2290	10.00	P.M. "
"	17	39	27.47	2425	6.30	A.M. "
"	17	58	27.37	2400	1.30	P.M. "
"	17	48			10.00	P.M. "
"	18	43			4.00	A.M. Rainy
"	18	41	27.45	2340	7.30	A.M. "
"	18	49	27.55	2240	1.30	P.M. Clearing, windy
"	18	56	27.55	2230	5.00	P.M. Light clouds and sun

1925

Month	Date	Temp	Barometer	Elevation	Time		Weather
June	18	49	27.60	2190	10.15	P.M.	(Sunset) Light clouds
"	19	40	27.66	2140	6.30	A.M.	"
"	19	56	27.66	2140	1.00	P.M.	Clear
"	19	55	27.60	2190	10.00	P.M.	Cloudy (Light)
"	20	47	27.73	2060	6.30	A.M.	Cloudy
"	"	52	27.83	1975	4.00	P.M.	"
"	21	46	27.87	1940	6.00	A.M.	"
"	21	62	27.76	2040	4.15	P.M.	Clear
"	21	57	27.73	2090	10.30	P.M.	(sunset) clear
"	22	43	27.74	2080	7.30	A.M.	Clear
"	"	68	27.70	2100	3.00	P.M.	"
"	"	63	27.70	2100	10.00	P.M.	"
"	23	45	27.77	2040	7.00	A.M.	"
"	"	61	27.79	2025	5.30	P.M.	Rainy
"	24	47	27.90	1900	6.30	A.M.	Cloudy
"	24	58	27.96	1850	5.00	P.M.	"
"	25	47	28.20	1790	7.00	A.M.	"
"	25	59	27.96	1850	12.00	A.M.	Clear
"	26	45	27.62	2160	5.00	A.M.	"
"	26	68	27.40	2390	6.00	P.M.	Cloudy
"	26	55	27.43	2350	9.15	P.M.	Raining
"	27	45	27.36	2425	7.00	A.M.	Cloudy (rained all night)
"	27	50	27.33	2440	12.00	A.M.	Cloudy
"	27	53	27.40	2460	7.00	P.M.	"
"	28	45	27.30	2470	6.45	A.M.	"
"	28	55	27.30	2470	6.00	P.M.	Light Clouds
"	29	46	27.25	2525	7.30	A.M.	Cloudy. time 1½ hrs. back
"	29	59	27.30	2470	1.45	P.M.	Light clouds
"	29	51	27.41	2360	8.30	P.M.	Cloudy
"	30	47	27.50	2260	6.00	A.M.	"
"	"	53	27.64	2150	3.45	P.M.	"
July	1	45	27.77	2050	8.30	A.M.	Raining
"	1	52	27.78	2000	8.00	P.M.	Clear
"	2	44	27.77	2040	6.30	A.M.	" Few light clouds
"	2	64	27.63	2160	6.00	P.M.	Clear
"	2	49	27.60	2200	10.00	P.M.	"
"	3	44	27.66	2130	4.00	A.M	"
"	3	50	27.66	2130	7.00	A.M.	"
"	3	66	27.62	2175	2.00	P.M.	"
"	3	58	27.64	2150	8.30	P.M.	"
"	4	44			4.00	A.M.	Light clouds
"	4	51	27.75	2050	6.45	A.M.	"
"	4	65	27.70	2100	6.00	P.M.	Clear
"	4	58	27.70	2100	9.30	P.M.	"
"	5	48	27.78	2030	4.00	A.M.	"
"	5	68	27.78	2030	1.45	P.M.	"
"	5	65	27.75	2025	8.30	P.M.	"
"	6	47	27.84	1975	5.00	A.M.	"

1925 Month	date	temp	Barometer	elevation	time	weather
July	6	51	27.84	1975	6.30 A.M.	Hazy. clear
"	6	75			3.00 P.M.	Clear
"	6	58			10.00 P.M.	"

Journey from McCarthy to the Summit of Mt.Logan and return to Cascade Camp.

Elevation of McCarthy about 1500 ft.
" " Mt.Logan 19850 ft.
Distance travelled from McCarthy to the summit of Mt.Logan 152 mi.
Aneroid "Logan Mountain Special", Short and Mason, London.
Physical Testing Laboratory, Ottawa, calibration April 27, 1925. (No.8408). This before the ascent of Mt.Logan. Calibrations under temperatures and pressures experienced on ascent, made at Bureau of Standards, Washington, May, 1926.

Following record by H.F.Lambart.

Temperatude and Aneroid readings taken from McCarthy to Summit of Logan and return to Hubricks Camp.

Date 1925	Time	Place	Temp. Fahr.	Aneroid Reading	Remarks
		Alaska		Short & Mason	
May 12		McCarthy			1414' Spot elevation given on plan. 1840'(not known how obtained.
" 12-13		Martin-Harris	33°	2720	Min.tem.last night. Day tem.mild.
" 13	P.M.	Undercliff Camp		2960	Min.tem.last night.
" 14	7.30 A.M.	" "	31°	2910	" " " "
" 14	12.45 P.M.	Rush Pond		2040	
" 14	6.15 P.M.	Flat Camp		2040	
" 15	8.00 A.M.	" "	33°	1900	" " " "
" 15	6.00 P.M.	Brysons		2050	
" 16	6.30 A.M.	"	32°	2080	" " " "
" 16	8.00 A.M.	"		2100	
" 16	7.00 P.M.	Short River		2625	
" 17	7.35 A.M.	" "		2650	
" 17	10.30 A.M.	Hubricks		2910	
" 18	8.15 A.M.	"	28°	2990	" " " "
" 18	1.45 P.M.	Trail End		4000	
" 18	9.20 P.M.	" "		4225	
" 19	A.M.	" "			
" 19	P.M.	Walsh Camp			
" 20	8.00 A.M.	" "		4100	
" 20	5.30 P.M.	Fraser-Baldwin		5000	
" 21	8 A.M.	"	29°	4750	" " " "
" 22	4.35 A.M.	"		4600	
" 23	A.M.	Boundary Camp	23°		" " " " Gray & overcast A.M.

Date 1925	Time	Place	Temp. Fahr.	Aneroid Reading	R e m a r k s
		CANADA			
May 23	P.M.	Turn Cache		6800'	
24	A.M.	" "	14°	6700'	Min.last night
25	A.M.	" "	25°		" " "
					33°late P.M.temp.
26	A.M.	"A,B,C"	18°		Min.last night
26	P.M.	" "		7600	
27	A.M.	" "	21	7600	" " "
27	4.20 P.M.	Cascades	18	8900	" " "
28	7.00 P.M.	"	18	9250	" " "
30	A.M.	"A,B,C"	4	7550	" " "
					(Lowest recorded)
31		Cascades	18		Min.last night
					Misty & overcast
31	4.45 A.M.	"A,B,C"		7480	
31	6.35 A.M.	"A,B,C"		7600	
31	1.00 P.M.	Cascades		8760	
31	6.15 P.M.	"		8750	
June 1	6.30 A.M.	"	20	8760	Min.last night
					Bright,cloudy,
					clear.
	5.00 P.M.	"		8775	
	P.M.	"		8775	
2	4.30 A.M.	"	25	8300	Min.last night
3		Quartz Ridge		9620	
		Observ. Camp		11150	
4	5.25 A.M.	" "	4	11125	" " "
	5.40 A.M.	The Dome		10800	Going back
		Quartz Ridge		9640	" "
	8.45 A.M.	The Dome		10790	" forward
	2.00 P.M.	The Dome		10850	
	3.00 P.M.	Observ.Camp		11175	
5	Midnight	" "	Min.+4°		Min.temp.last
					night.
	7.00 A.M.	" "	+18°	11260	Heavy fog-light
					snow to clearing
	9.50 A.M.	" "		11180	
	Foot of King				
	ice fall			12680	
	3.15 P.M.	Pt.cache			
		near top of			
		col.		14050	Storming,heavy
					cold wind.
	3.25 P.M.	" "		"	
	4.55 P.M.	Observ.camp		11160	
	8.00 P.M.				
	(approx.)	" "	+20°		
6		" "	- 4°F		Min.last night
	5.50 A.M.	" "		11100	Bright and clear,
					last night heavy
					wind.

Date	Time	Place	Temp. Fahr.	Aneroid Reading	Remarks
1925		CANADA			
June 6	6.00 P.M.	Summit of the King Col.		15000°	

Differences Aneroid Readings not recorded:

Observation Camp to foot of King Ice fall: 1550
King Ice fall to 1st cache above 1330
1st cache to Summit of Col. 1055

No corrections for temperature made here or anywhere else in this record.

7	8.00 P.M.	Observ.	Zero		Min.last night.
	8.00 P.M.	camp		11050	
8		" "	+ 3°		" " "
	5.48 A.M.	" "		11000	
	8.40 A.M.	King Ice Fall		12500	
	9.50	" "		12500	
	11.25	1st cache on col.		13925	
	1.30	King Col Camp		14860	
	2.15	" "		14775	
	3.00	King Ice Fall		12560	
8-9		King Col Camp	+ 3°		" " "
9	7.15	Observ. Camp		10990	
	10.45	King Ice Fall		12550	
	2.30	" "			
	5.30	King Col Camp	24°F	14660	
10		" "	+ 4°		" " "
11	10.50 A.M.	" "		15030	Storming to clearing in P.M.
	4.45 P.M.	Cache above		16250	
	8.00 P.M.	King Col Camp	19°		
12	7.30 A.M.	" "	14°		Snowing and storming hard
13		" "			Steady snow storm all last night.
		" "			Very sticky and storming.
14	2.30 P.M.	First cache above		16280	
	6.15 P.M.	Ice cliff camp	18°	16700	Overcast

Date	Time	Place	Temp. Fahr.	Aneroid	Remarks
1925		CANADA			
June 15		Ice Cliff Camp	+ 7°		Min.last night
	11.30 A.M.	" " "	28		A great deal of new snow,night and morning, and
	11.45 A.M.	" " "	26	16840	weather mild.
	7.10 P.M.	" " "	+ 6	16830	Clearing,aneroid rising,colder.
16	8.00 A.M.	" " "	- 3F.	16850	This camp (Windy)
	6.30 P.M.	Windy Camp	-10°F	18900	shown to be 1100 2100 ft.too high-using uncorrected barometer readings.

Per Allen Carpe, June 16.1925.

Using Abney hand level with scaled distances

Angle to King Peak 0°47'00"
Scaled map dist. 4 mi.
Corr.to angle + 1'29"
Corrected " 0°48'29", log.tan = 8.1493474
Log.4 mi.in feet = 4.3246939
2.4740413 = -298
Height of King Peak 17130
16832

Angle to Mt.St.Elias 0°22'00"
Scaled map dist. 25 mi.
Correction to angle + 9'22"
Corrected angle 0°31'22", Log tan = 7.9602065
Log tan distance in feet 5.1205739
3.0807804=1204
Height of St.Elias 18008
16804

16832
16804
Windy Camp elevation.....16818

June 17		Windy Camp	-32°F		Min.temp.last night
	8.30 A.M.	" "	- 2°F	18900	Clouded over all day
	9.00 A.M.	" "	- 3°F	18900	
	3.30 P.M.	" "	Zero	20900	
	6.45 P.M.	" "	18°	about 18950	
18	1.00 P.M.	" "	14°	18910	

Date	Time	Place	Temp. Fahr.	Aneroid	R e m a r k s
1925		CANADA			
June 18	2.25 P.M.	Ice Cliff Camp		16875'	
	5.55 P.M.	King Col Camp	16°	14950	
19		" " "	-4°F		Min.last night
	8.45 A.M.	" " "	+4°F		
	9.20 A.M.	" " "	+20°F		" " "
19		Windy Camp	-33°F		" " "
					Coldest record
21	3.12 P.M.	" "		18340	Very severe
	9.20 P.M.	"18.5" Camp		20100	storm, cleared some in P.M. clouding up finally.
22	8.15 P.M.	" "	- 5°F	20160	Bright A.M. to clouding
		" "	-17.5°F		Min.last night at almost 18500
	10.00 A.M.	" "	+ 5°F	20250	
	11.50 A.M.	" "	Warmer		
	5.00 P.M.	"Plateau Camp"		19250	
23		" "	-15°F		Min.last night, bulb covered with snow.
23	10.15 A.M.	" "	+15°F	19250	Clear to stormy and fog P.M.
23	8.00 P.M.	Summit of Logan	+ 4°F	21520	Completely fogged up.
			-12°F		Thermometer lost night 23-24,no records for 24,25 26, on latter day experienced snow and blizzards of 60 mile per hour.
23	10.30 P.M.	Snow bivouac		20700	Time and temp. reading here largely conjecture,from notes in diary to the effect that readings Show snow bivouac of 23-24 to be 1000 ft.below summit.

Date	Time	Place	Temp. Fahr.	Aneroid	Remarks
1925		CANADA			
June 26	10.45 A.M.	Plateau Camp	+10°F	19250	
26	1.30 P.M.	Hurricane ridge ("18.5" Camp Site ~~Mtr.~~)	Zero	20200	
	2.30 P.M.	"Windy Camp"	+12°	18470	
	12.55	King Col	+12°	15100	
28	12.00 Noon	" "		15340	
28	1.25	King Col ice fall	+15 1/2°	13090	
28	Midnight	"Cascades"	20°F	9100	
30	A.M.	"		8940	
30	5 A.M.	"	+18°	8850	
		"Quartz Ridge"	+17°	9850	
		Observ.Camp	+25°	11450	Aneroid taken on a trip back to the King ice fall- Tuesday, June 30.
	1.30 P.M.	King Ice Fall	+17°	12900	
	5.00 P.M.	Observ.Camp	+24°	11300	
		"Quartz Ridge"	+32°	9700	
		"Cascades"	+28°	8700	
July 1	A.M.	"Cascades"	+23°	8600	
1	6.20 P.M.	"Turn Cache"	+ 35°	6575	
2	6.20 P.M.	" "		6740	
4	Noon	"Fraser B. Cache"	+60°	4660	
5	"	"Chitina Pt."	70°	3650	
5	7.40 P.M.	Trail End	52 1/2°	3750	
6	9.00 A.M.	" "		3650	
	4.00 P.M.	End of base line	60°	2025	True elev. here-2008 ft.
	5.10 P.M.	Hubrick's Camp		2940	

End of all readings

LOG OF ANEROID AND TEMPERATURE READINGS

ON THE JOURNEY FROM McCARTHY to the SUMMIT OF MOUNT LOGAN AND RETURN, MAY 12TH to JULY 12TH, 1925.

Distance	Date 1925	Time	Place	Temp. Fahrenheit	Aneroid Reading	Remarks
McCarthy			McCarthy		S and M	1414 Spot elev.
18 mi.	May 12		Alaska			given on plan
Martin-			Martin-			1840 (not known
Harris	12-13		Harris	33°	2720	how obtained.
						Min Tem last
						night, day temp.
						mild.
	13	P.M.	Undercliff		2960	
12 mi.	14	7.30 A.M.	"	31	2910	Min temp.last night
	14	12.45 P.M.	Rush Pond		2040	
Undercliff	14	6.15 P.M.	Flat Camp		2040	
12 mi.	15	8.00 A.M.	" "	33	1900	Min Tem.last night
Flat Camp	15	6.00 P.M.	Brysons		2050	
12 mi.	16	6.30 A.M.	"	32	2080	Min.Tem.last night
	16	8.00 A.M.	"		2100	
Brysons	16	7.00 P.M.	Short River		2625	
16 mi.	17	7.35 A.M.	" "		2650	
Short River	17	10.30 A.M.	Hubrick's		2910	
7 mi.	18	8.15 A.M.	"	28	2990	Min Tem.last night
Hubricks	18	1.45 P.M.	Trail End		4000	
7 mi.	18	9.20 P.M.	" "		4225	
Trail End	19	A.M.	" "			
5 mi.	19	P.M.	Walsh Camp			
Walsh Camp	20	8.00 A.M.	" "		4100	
	20	5.30 P.M.	Fraser-Baldwin		5000	
7 mi.	21	8.00 A.M.	" "	29	4750	Min Tem.last night
Fraser-Baldwin						
Camp	22	4.35 A.M.	" "		4600	
12 mi.	23	A.M.	Bndry Camp	23		Min Tem.last night
						Hazy overcast A.M.
Bndry Camp			Canada			
"M" Cache	23	P.M.	Turn Cache		6800	
12 mi.	24	A.M.	" "	14	6700	Min Tem.last night
"Turn Cache"	25	A.M.	" "	25		Min 33 late PM Tem
7 mi.	26	A.M.	"A.B.C."	18		Min Tem. last night
"A.B.C."	26	3.30 P.M.	"		7600	
5 mi.	27	A.M.	"	21	7600	Min Tem.last night
Cascades	27	4.20 P.M.	Cascades	18	8900	" " " "
Half Mile	28	7.00 P.M.	"	18	9250	" " " "
	30	A.M.	"A.B.C."	4	7550	" " " "
						Lowest recorded
Quartz Ridge	31		Cascades	18		Min last night
						Misty & overcast
3/4 mi.	31	4.45 A.M.	"A.B.C."		7480	
The Dome	31	6.35 A.M.	"		7600	
3/4 mi.	31	1.00 P.M.	Cascades		8760	
Observation						
Camp	31	6.18 P.M.	Cascades		8750	

Distance	Date 1925	Time	Place	Temp. Fahrenheit	Aneroid Reading	Remarks
	June 1	6.30 A.M.	Cascades	20	8760	Min last night Bright Cloudy Clear
4½ mi.		5.00 P.M.	Cascades		8775	
King Ice Fall		P.M.	Cascades		8775	
	2	4.30 A.M.	Cascades	25	8800	Min last night
1¼ mi.	3		Quartz Ridge		9630	
			Observation Camp		11150	
1st Cache King Col	4	5.25 A.M.	"	4	11125	Min last night
		5.40 A.M.	The Dome		10800	Going Back
¼ mi.			Quartz Ridge		9640	" "
King Col Camp		8.45 A.M.	The Dome		10790	" Forward
	4	2.00 P.M.	" "		10850	
		3.00 P.M.	Observation Camp		11175	
	5	Midnight	Observation Camp	+ 4		Min Temp last night
		7.00 A.M.	Observation Camp	+18	11260	Heavy fog, light snow to clearing
		9.50	Observation Camp		11180	
		3.15 P.M.	Foot of King Ice Fall		12680	
			1st Cache near top of col		14050	Storming, heavy cold wind
		3.25	1st Cache near top of col		14050	
		4.55	Observation Camp		11160	
		8.00 P.M.	(Approx) Observation Camp	+20		
	6		Observation Camp	- 4		Min last night
		5.50 A.M.	Observation Camp		11100	Bright & Clear last night heavy wind
		6.00 P.M.	Summit of King Col			
King Col Camp 1¼ mi.						(Differences from (Aneroid Readings (not recorded
Cache on heights above the col						Observation Camp to foot of King Ice Fall 1550
1¼ mi						(King Ice Fall to 1st (Cache above 1330
						1st cache to summit of Col 1055
Ice Cliffe Camp						(No corrections for (temperature made
1¼ mi.						(here or any where (else in this record

Distance	Date	Time	Place	Temp Fahrenheit	Aneroid Reading	Remarks
Windy Camp	June 6					
2 mi.	" 7		Observation Camp	Zero		Min last night
"18.5" Camp		8.00 p.m.	Observation Camp		11050	
3 mi.	" 8		Observation Camp	-13		Min last night
Plateau Camp		5.48 A.M.	Observation Camp		11000	
1¾ mi.		8.40	King Ice Fall		12500	
1st Summit		9.50	King Ice Fall		12500	
1¼ mi.		11.25	1st Cache on Col		13925	
Logan		1.30	King Col Camp		14860	
		2.15	King Col Camp		14775	
		3.00	King Ice Fall		12560	
	June 8-9		King Col Camp	-13		Min last night
	" 9	7.15	Observation Camp		10990	
		10.45	King Ice Fall		12550	
		2.30	King Ice Fall			
		5.30	King Col Camp	24	14660	
	" 10		King Col Camp	-14		Min last night
	" 11	10.50 A.M.	King Col Camp		15030	Storming to clearing in P.M.
		4.45 P.M.	Cache above		16250	
		8.00 P.M.	King Col Camp	19		
	" 12	7.30 A.M.	King Col Camp	14		Storming and snowing hard
	" 13		King Col Camp			Steady snow storms all last night
			King Col Camp			Very thick and storming
	" 14	2.30 P.M.	1st Cache Above	16280		
		6.15 P.M.	Ice Cliff Camp	18	16700	Overcast
	" 15		Ice Cliff Camp	-17		Min last night
		11.30 A.M.	Ice Cliff Camp	28		A great deal of new snow night and morning and weather mild
		11.45 A.M.	Ice Cliff Camp	26	16840	
		7.10 P.M.	Ice Cliff Camp	-16	16830	Clearer, Aneroid Rising, colder

Distance	1925 Date	Time	Place	Temp Fahrenheit	Aneroid Reading	Remarks
	June 16	8.00 A.M.	Ice Cliff Camp	-3	16850	
	" 16	6.30 P.M.	Windy Camp	-10	18900	This camp (Windy) shown to be 1100 too high using uncorrected barometer readings.

Per Allen Carpe June 16, 1925

Used Abney hand level with scaled distances

Angle to King Peak 0° - 47' - 00"
Scaled map distance 4 miles
Correction to angle + 1' 29"
" angle 0° - 48' - 29" log tan - - - 8.1493474
Log 4 mi feet - - - 4.3246939
2.4740413
= -298
Weight of King Peak 17130
16832

Angle to Mt. St. Elias 0°-22'-00"
Scaled Map distance 25 mi
Correction to angle + 9'-22"
Corrected angle 0°-31'-22" log tan - - - 7.9602065
Log tan distance in feet - - - 5.1205739
3.0807804
= 1204
Height of St. Elias 18008
16832 16804
16804

Windy Camp Elevation ---------- 16818

Continued

June 17		Windy Camp	-32		Min Tem last night
	8.30 A.M.	" "	- 2	18900	Clouded over all day
	9.00 A.M.	" "	- 3	18900	
	3.30 P.M.	" "	0	20900	
	6.45 P.M.	" "	18	18950	Temp(about)
" 18	1.00 P.M.	" "	14	18916	
	2.25	Ice Cliff Camp		16875	
	5.55	King Col Camp	16	14950	
" 19		" "	-4		Min last night
	8.45 A.M.	" "	14		
	9.20 A.M.	" "	20		
" 19		Windy Camp	-33		Min last night Coldest record
" 21	3.12 P.M.	Windy Camp		18340	Very severe storm
	9.20 P.M.	18.5 Camp		20100	cleared some in PM clouding up finally
" 22	8.15	18.5 Camp	-5	20160	Bright AM to clouding
		" "	-17.5		Min last night at almost 18500

Distance	1925 Date	Time	Place	Temp Fahrenheit	Aneroid Reading	Remarks
	June 22	10.00 A.M.	18.5 Camp	+5	20250	
		11.50 A.M.	" "	Warmer		
		5.00 P.M.	Plateau Camp		19250	
	" 23		" "	-15		Min last night bulb covered with snow
	" 23	10.15 A.M.	Plateau Camp	+15	19250	Clear to storm and fog PM
	" 23	8.00 P.M.	Summit of Logan	+ 4	21530	Completely fogged ~~up~~
				-12		Thermometer lost night (23-24th) no record for 24-25-26 on latter day experienced snow and blizzards of 60 mi per hour
	June 23	10.30 P.M.	Snow Bivouac		20700	Time and temperature reading here largely conjecture from a note in diary to the effect that readings Snow Bivouac of 23-24 to be 1000 feet below summit
	" 26	10.45 A.M.	Plateau Camp	+10	19250	
	" 26	1.30 P.M.	Hurican Ridge	0	20200	
			18.5 Camp			
		2.30	Windy Camp	+12	18470	
		12.55	King Col	+12	15100	
	" 28	12.00 Noon	" "		15340	
"	" 28	1.25	King Col Ice Fall	+15½	13090	
	" 28	Midnight	Cascades	20	9100	
	" 30	A.M.	Cascades		8940	

	" 30	5.00 A.M.	Cascades	+18	8850	
			Quartz Ridge	+17	9850	
			Observation Camp	+25	11450	Aneroid taken on a trip back to the
		1.30 P.M.	King Ice Fall	+17	12900	King Ice Fall
		5.00 P.M.	Observation Camp	+24	11300	Tuesday June 30
			Quartz Ridge	+32	9700	
			Cascades	+28	8700	

Distance	1925 Date	Time	Place	Temp Fahrenheit	Aneroid Reading	Remarks
	July 1	A.M.	Cascades	+23	8600	
		6.20 P.M.	Turn Cache	+35	6575	
	" 2	6.30 P.M.	" "		6740	
	" 4	Noon	Fraser B Cache	+60	4660	
	" 5	Noon	Chitina Point	70	3650	
		7.40 P.M.	Trail End	52½	3750	
	" 6	9.00 A.M.	" "		3650	
		4.00 P.M.	End of Base line	60	3025	True Elev. here 2008 feet
		5.10	Hubricks Camp		2940	

APPENDIX III.

FROM THE PHYSICAL TESTING LABORATORY RELATIVE TO THE CONSTRUCTION OF A SPECIAL ANEROID BAROMETER

January 16th, 1925.

Mr. Lambart,
Geodetic Survey,
Dept. of the Interior,
OTTAWA.

MEMORANDUM:

Herewith is a draft of the specifications for a mountain climbing aneroid, prepared in accordance with your request. We have asked for the aneroid to be compensated around a pressure of 21" as it is presumed you will be working mainly at elevations about 10,000 ft.

If you are unable to obtain a satisfactory instrument and do not want to register low elevations it might be possible for us to reset one of the surveying aneroids to operate say between 8,000 and 22,000 ft., but it would be preferable for you to obtain a new one, if one of the good makers is willing to supply it. Short and Mason (England) and Juliam Friez, Baltimore are I consider the most likely firms to supply what you want. The Hughes Owens Coy. is agent for both of these. Possibility if you stressed the publicity given to your expedition they might go out of theirway a little to help you by reason of the advertisement they would obtain.

I would recommend that you state in your inquiry that while tolerances have been set for the drift and temperature scale value effect, you would welcome an instrument with errors considerably better than the figures given.

In any case I would suggest that you let us have the aneroid for a complete test, with what information you have as to the conditions you expect to encounter.

Yours very truly,

Sgd. R.H. Field.

Acting Supervisor,
Physical Testing Laboratory.

SPECIFICATIONS FOR ANEROID BAROMETER FOR ASCENT OF MOUNT LOGAN

GENERAL

The case which should not exceed 4" external diameter shall be as light in weight as is consistent with rigidity. Aluminum alloy may be used provdied it is of sufficient strength and thickness to ensure rigidity. The instrument itself must be mounted on a rigid base plate which must be mad of a material at least as hard as brass.

The effective range of the instrument must be at least twenty-two thousand feet. The dial shall be accurately graduated with two scales fixed relative to each other, the inner scale showing inches of pressure and the outer, feet altitude, this scale should have equal intervals for each 1000 ft. and these intervals should not measure less than 1/2" of the graduated circumference on the dial. The scales shall be subdivided to 0.05 inch and 50 feet respectively. The graduation marks shall be sharp, regular and distinct with minimum width consistent with good visibility. The hand shall be mounted as close to the dial as possible without danger of interference and the breadth at the end over the graduations shall be a minimum.

MECHANISM

The aneroid shall be compensated for temperature and preferably adjusted so that the variations in its indications shall be a minimum at the higher altitudes of its scale instead of around sea-level altitude as in the usual type of aneroid. The mechanism shall be designed and constructed with due regard for the obtaining of accurate results in mountain climbing operations. In particular the carriage supporting the main-spring shall be held rigidly, and in such a way that looseness will not develop under ordinary treatment in service. The method employed for setting tha hand shall be such that it cannot be disturbed by jars given to the instrument. The main-spring shall be held rigidly in the carriage, preferably with screws passing right through the spring, and the knife-edge shall be carefully located on the spring so that no relative movement will take place in service and alter the indications of the hand from this cause. All hinge joints and pivots shall be carefullt fitted and properly finished to diminish friction, but avoid backlash. The workmanship generally must be first-class.

TEST

The instrument, before acceptance, will be subjected to the following test at the Surveys Laboratory, and its performance must comply with the tolerance given below.

Programme of Test

Part	Name of Test	Remarks
1.	Preliminary examination	Instrument examined for mechanical and other defects.
2.	Temperature test at constant pressure.	Instrument maintained at pressure of about 21" of mercury while temperature is varied.

3.	Calibration and drift	Instrument calibrated at 20° C and drift in five hours determined.
4.	Temperature test with diminishing pressure.	Instrument calibrated at 0°C and 40° C.

PART 1.

The instrument is given a general examination, to check the design, workmanship and existence of any obvious defects, or failure to comply with the requirements set out above. It is then subjected to the following tests to detect friction, looseness, lack of rigidity and want of balance.

1. The instrument is tapped and the maximum range within which the hand comes to rest is recorded as the deviation by tapping.

2. The instrument is held in the horizontal position and struck against the palm of the observer's hands, first against one hand and then (without rotating it) against the other. In each case a reading is taken immediately afterwards in the horizontal position. During several repetitions of this test, the greatest difference between any two (not necessarily consecutive) readings is recorded as the shift.

3. The instrument is read in the horizontal position, after tapping gently, and immediately afterwards in the vertical position. The variation in reading gives the vertical correction.

PART 2.

The aneroid is placed in the thermal chamber and allowed to remain at a constant temperature of 20° C and pressure of about 21" for a sufficient length of time to take up the drifting tendency (about two days at least). A comparison is then made between the reading of the aneroid and the true pressure, as given by the mercury barometer. The temperature of the chamber is then reduced and held at 0° C for a further three hours. The reading is again recorded and compared with that of the standard barometer. After the chamber has been heated to 40° C the aneroid is allowed to remain at this temperature for four hours, and another comparison made with the standard. A final comparison is made after the aneroid has stood at the original temperature, 20°C for a period of three hours. Throughout this part the aneroid remains at a pressure of approximately 21" of mercury.

PART 3.

The calibration errors at normal temperature (20°) are determined while the pressure is being reduced at the rate of one inch of mercury in five minutes, readings are taken at every inch of the scale. When the index has reached the lowest pressure intended to be read, the pressure is maintained constant for five hours. A second set of readings is then taken while the pressure is allowed to increase at the rate of one inch in five minutes. The drift is determined by the change in the corrections during the five hour interval.

PART 4.

The temperature test is divided into two portions, the instrument beingcalibrated in the thermal chamber at temperatures of 0°C and 40°C. Before calibration the instrument is allowed to stand at the temperature of test for three hours, the pressure being then reduced at the normal rate of one inch in five minutes. Comparisons are made between the aneroid and the mercury barometer at every inch. The results of the decreasing pressure test, Part 3. giving the calibration corrections at normal temperature, are taken in conjunction with this test.

Tolerances.

The tolerances allowed in the above tests are as follows:-

(1) The deviation by tapping shall not exceed 0.02 inch of mercury.

(2) The shift shall not exceed 0.03 inch of mercury.

(3) The vertical correction shall not exceed 0.04 inch of mercury.

(4) The proportion drift shall not exceed 0.010 inch of mercury.

(5) When the calibration corrections at any temperature are plotted to scale, the average deviation of the points from the mean straight line drawn through them shall not exceed 0.02 inch of mercury, and the greatest deviation at any point from this line shall not exceed 0.04 inch of mercury. If the points lying above the mean straight line be taken as having positiove deviation and points below the line negative deviation, the algebraic difference between the deviations of any two consecutive points one inch apart shall not exceed 0.03 inch of mercury.

(6) The greatest variation in reading at the constant pressure of 21" in the temperature range 0° to +40°C shall not exceed 0.08 inch of mercury.

(b) The greatest variation in reading at the constant pressure of 21" in the temparature range 0°C to +20°C or + 20°C to +40°C shall not exceed 0.05 inch of mercury

(7) The greatest difference in scale value between 0°C and +40°C shall not exceed 4 per cent.

Definition of terms used above.

"Drift" is the amount of decrease in reading when an aneroid remains at a constant but reduced pressure.

"Proportional Drift" is the amount of drift divided by the change in pressure producing the drift.

In the above test the proportional drift is taken as the mean of the differences between the increasing and decreasing pressure corrections for

for each inch, in the calibration test, Part 3, divided by the total pressure drop.

"Scale Value" is the mean value of one unit on the scale of the aneroid in terms of the true pressure change.

PHYSICAL TESTING LABORATORY

SUMMARY OF TEST OF ANEROID BAROMETER NO. PTL 8408
TAKEN TO THE SUMMIT OF MT. LOGAN
(Previous to ascent)

Name: Mountain Special Maker: Short and Mason

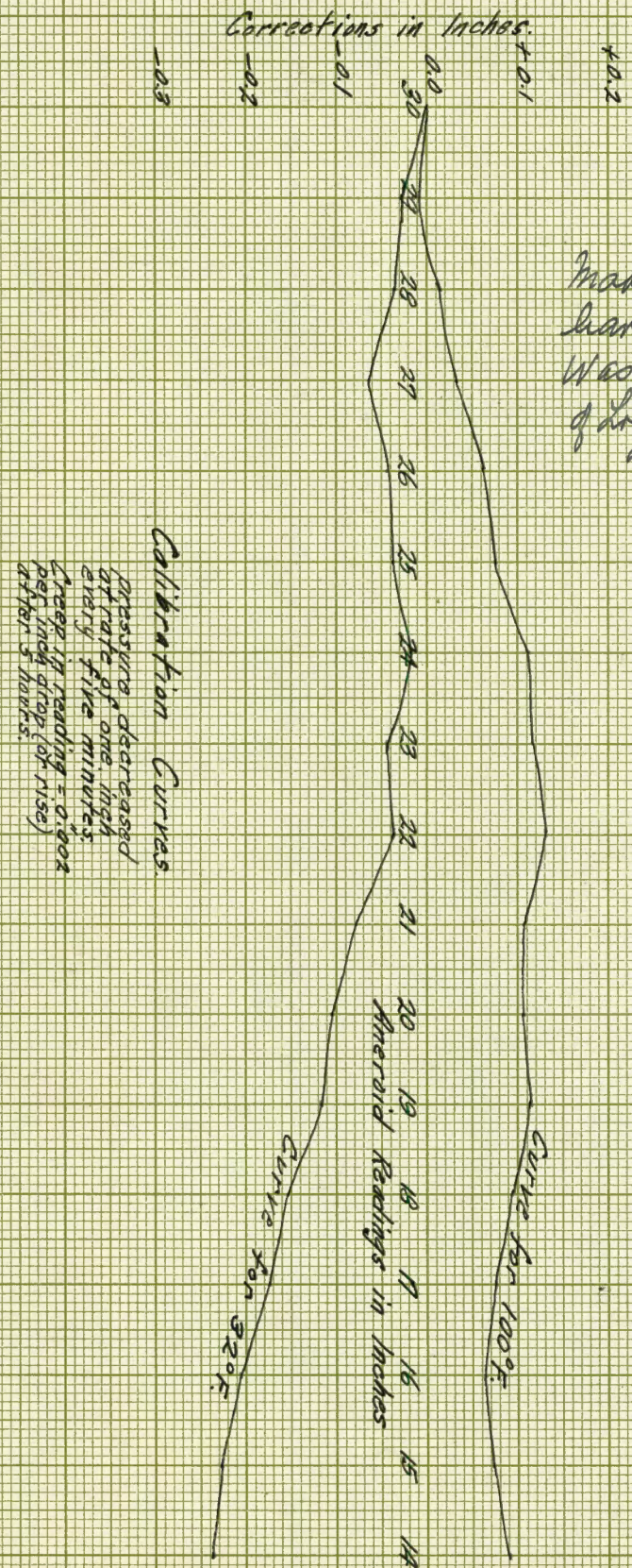
Range: 31" to 14" Diam. 4" Smallest Scale Division o".05

Submitted by: Geodetic Survey of Canada

Test No. 8408 Date: April 27th, 1925.

CRITERIA	Actual Amount	Specifications for Special Aneroid
1. Average Deviation by Tapping	0".02	0.02 Inch
2. Shift	0.03	0.03 "
3. Vertical Correction	0 .04	0.04 "
4. Proportional Drift	0 .002	0.010 "
5a. Mean Calibration Deviation	0 . 03	0.02 "
5b. Maximum Calibration Deviation	0 .04	0.04 "
5c. Maximum difference between deviations at any two consecutive inches	0 .03	0.03 "
6a. Correction at Normal Pressure at 0°C	0 .00	)
Correction at Normal Pressure at 20°C	0 .00	) at 30"
Correction at Normal Pressure at 40°C	0 .01	) Pressure
Difference at Normal Pressure, between the corrections at 0° and 40°C	0 .01	) 0.08 "
6b. Maximum difference at Normal Pressure between corrections at 0° and 20°, or		) (At 21" Pressure) 0.05 "
20° and 40°C	0 .01	) (At 21" Pressure)
7. Scale Value at 0°C	1 .02	
Scale Value at 20°C	1 .01	
Scale Value at 40°C	1 .00	
Greatest Difference in Scale Value in the Rane 0° - 40°C	0 .02	0.04 Inch

NOTE: After Ascent.
This aneroid is undergoing tests in Washington under conditions as nearly as possible as they occurred on the climb - The eratic readings above 14,500 ft have not yet been accounted for and it is hoped with this information to deduce satisfactory results from the readings taken.



Made in Spring 1925 before leaving Ottawa for Logan. Was taken to the Summit of Logan (June 23 1925).

Ref. 2

Calibration Curves.
Pressure decreased gradually one inch every five minutes. Creep in reading = 0.002 per inch drop (or rise) after 5 hours.

SHORT & MASON ANEROID
for Mt. Logan Ascent.

PHYSICAL TESTING LABORATORY

Summary of Test of Aneroid Barometer No. 1455
(Used in Readings taken at Kennscott, Alaska,
May - July 1925).

Name: Stanley, London

Range: 31" to 21" Diam: $4\frac{1}{2}$" Smallest scale Division 0".05

Submitted by: Geodetic Survey of Canada

Test No. 8416 Date: April 27th, 1925.

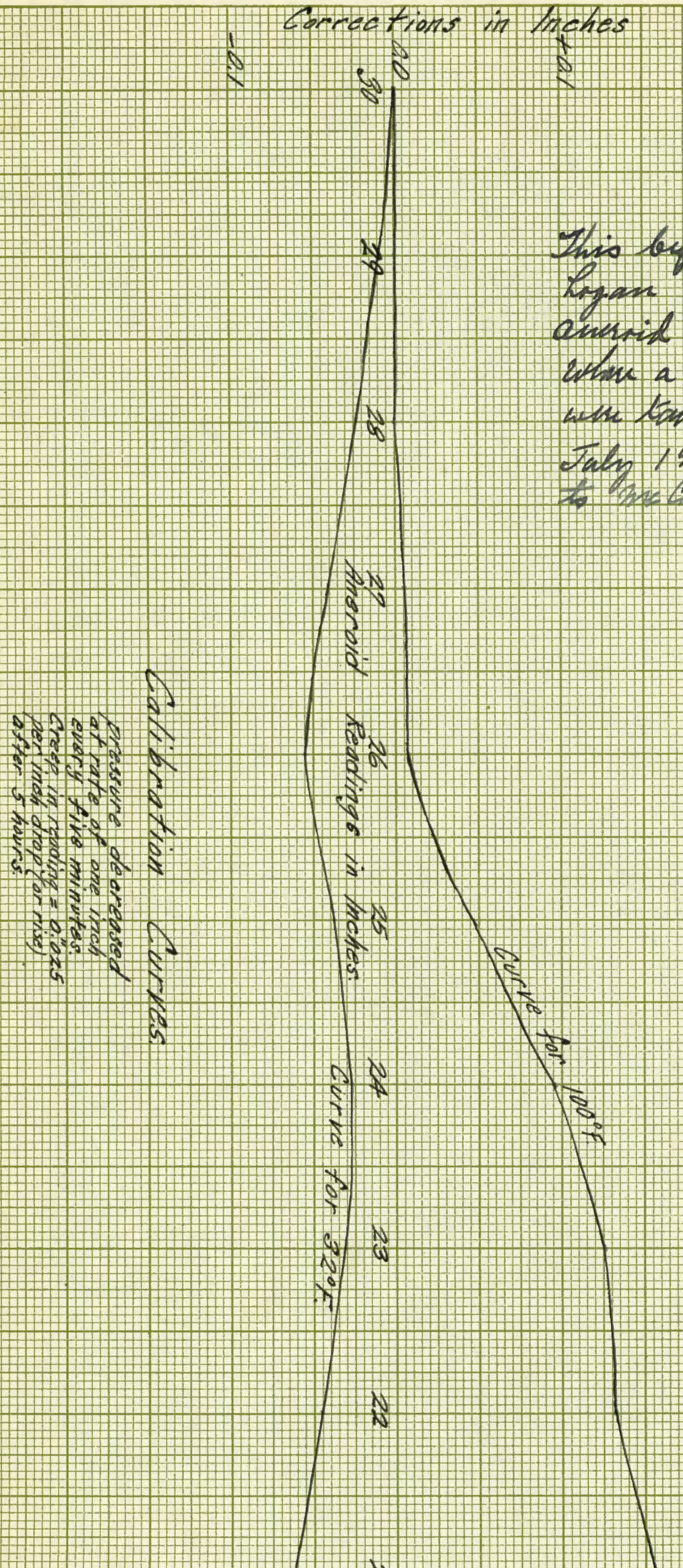
XXXXXXXXXXXXXXXXXX

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXX

	CRITERIA	Actual Amount	Tolerance Allowed
1.	Average deviation by Tapping	0".02	0.02 Inch
2.	Shift	0.10	0.03 "
3.	Vertical Correction	0.05	0.04 "
4.	Proportional Drift	0.027	0.02 "
5a.	Mean Calibration Deviation	0.02	0.03 "
5b.	Maximum Calibration Deviation	0.04	0.05 "
6a.	Correction at Normal Pressure at 0°C	0.02	
	Correction at Normal Pressure at 20°C	0.00	
	Correction at Normal Pressure at 40°C	0.01	
	Difference at Normal Pressure, between the corrections at 0° and 40°C	0.01	0.10 "
6b.	Maximum difference at Normal Pressure, between corrections at 0° and 20°, or 20° and 40°C	0.02	0.06" "
7.	Scale Value at 0°C	1.01	
	Scale Value at 20°C	1.00	
	Scale Value at 40°C	0.99	
	Greatest Difference in Scale Value in the range 0° - 40°C	0.02	0.05 "

NOTE: After return of expedition.

Test carried out in Ottawa in 1926, showed that this aneroid had undergone no appreciable change since the other test was made.



This before leaving Ottawa for Logan April 1925.
Aneroid left at Kennecott Alaska where a continuous series of readings were taken from May until July 1925 - after return of party to McCarthy -

STANLEY ANEROID
For
H.F. LAMBART. D.L.S.

A P P E N D I X IV.

PROPOSED SURVEY WORK AND INSTRUMENTS USED ON THE EXPEDITION

As an unknown stretch of country of nearly 2,000 miles square from the boundary (141st meridian) 60 miles, to Lake Kluane, and from the head of the Donjek River on the north, to the peaks marking the boundary (Southeastern Section) on the south, it was felt that a photo-topographical party attached to the expedition would have been well advised.

The topographical sheets of the Boundary Surveys had been completed, and as the district in itself is of no value commercially - apart from possible discovery of minerals - the suggestion did not commend itself.

CAMERAS. The camera was perhaps the most valued part of the accoutrements carried on the expedition, which at one time or another every member of the expedition was provided with the one exception of Col. Foster. Four motion picture cameras were in the expedition to start with, one, a heavy 'Universal' outfit loaned by the Department of Trade and Commerce, was operated by Mr. Laing who took it only as far as "Trail End" and rendered good service at Hubrocks camp, on natural history, during the expedition. It came in again in recording the activities of the expedition on July 6th when it returned to Hubricks and up to the departure of the rafts down the Chitina River on the 11th. Four thousand feet of standard film was supplied for this camera through the courtesy of the Department of Mines.

From the edge of the timber to the summit and back again the Bell and Howell .16 mm 'Filimo' camera is responsible for all the splendid snow pictures ta en by its owner Mr. Allen Carpe.

Two thousand five hundred feet of this film, in 100 foot

lengths was easily carried and loaded into the camera under the most savier conditions.

It is remarkable how well the spring motor worked on this camera in cold weather. Using often a very light wood tripod Mr. Carpe was tireless in his efforts, photographing the activities of the party at every important move while on the trail.

Besides these two motion picture cameras - which gave a continuous story - there were two "Sept" (16 feet of film only can be taken at a time) cameras, these on account of their short exposure of film and difficulty of loading were never in general use. One was left behind at McCarthy while the other made short start records from time to time and was finally left at the "Cascades" camp.

STILL CAMERAS The best still pictures were taken by Mr. Panross camera , using panchromatic cut film with a "K 1" screen. The labour and trouble of loading plate holders however outweighs the gain in the use of this film. Splendid results were obtained with the "Agfa" film pack which worked splendidly, very much easier to pack, lighter and infinitely easier to operate.

Mr. Carpe says of his own camera - "It seems to be true that roll film is not so easy to handle as film packs under conditions of exposure.

N.B. Enlargement from the 16 mm Filmo film to the standard is made by the Eastman Co. of Rochester at 20c. a foot, which consists of the negative and one positive print.

"Mine was a roll film camera, Protar lens, equipped with levels of about 70 seconds of arc per graduation - horizontal notches for topographic use".

The rest of the cameras were Kodales of a verying sizes.

It will have to be admitted that the small kodak which could be worked without having to remove heavy mittens and which could be produced at a moments notice was responsible for some of the most valuable pictures taken and under conditions when it was utterly impossible to use the others.

FIELD GLASSES A pair of very small and light eight power prism binoculars carried by Mr. Read and a small prism monacle of Mr. Carpe's proved of great value.

ABNEY HAND LEVEL An Abney hand level of Mr. Carpe's settled our disputes regarding relative heights of the humps on the summit of the massif and which was used to check up an elevation at "Windy Camp" when the aneroids had apparently failed, was of no little value.

ANEROID BAROMETERS Only one aneroid reached the summit of Logan. The record of this instrument and of others at fixed points through the term of the climb are dealt with separately in the following appendices.

APPENDIX V.

CLIMBING EQUIPMENT

ALPINE LINE AND ROPE. Standard English and Swiss alpine rope was used and in addition a thousand feet of alpine line (3/8 to 1/2 inch manilla rope)

1000' Alpine line, 700' weight 17 lbs.

300' " 11 "

2 - 150' Climbing Rope.

1 - 120' " "

2 - 100 ' " "

ICE AXES Lengths and weights to suite individual, one for each with six spares. Three spare axes would be sufficient. Very satisfactory make.

PARKAS Ten, one for each, by Woods Mfg. Co. Ltd. Hull or Abercrombi & Fitch New Yotk. Are best of light waterproof silk (long fibered cotten) with puckering strings for wrists and capechon, fur trimmed for winter but better without whem likely to be wet. Deep front pocket with sleeve made full at armpit to permit arm being withdrawn. Weight 2¼" to 4 lbs Cost 5.50 to 10.00. The parka is an absolutely indespensible part of the climbing equipment.

Rubberized and oiled silk fabrics which harden in cold weather are useless. The softer and more pliable the material the better.

SNOW GLASSES A good many spares should be taken.

Swiss type of large amber green glass with protection of sides by metal gauze. Velvet pad edgeing fitting the eye socket comfortably. Glasses supplied by Henry Fyhres Gstaad Bermese Oberland, Switzerland, with aluminum rims were the most satisfactory in the long run but for some were not dense enough and in these cases lenses were taken from spares and a

double lense used. No snow blindness was experienced by any with perhaps the one exception of Mr. Carthy who unfortunately had some infection to start with.

SNOW SHOES Too much care cannot be bestowed on the selection of snow shoes. Two general types were used which unfortunately were not always put to the best use.

The long "Klondike" (60" and 42") found best on the lower stretches of the glaciers where grades are light, snow heavy and making trail for a sleigh is an important factor these types are undoubtedly the best but when used on steep slopes and where they have constantly to be carried on the back ready to exchange for the Crampon are not wholly satisfactory.

On the mountain the "Bear Paw" with the detachible crampon under the ball of the foot on the underneathpart of the shoe, are infinitely better.

Where much sledding has to be done and where weight can be afforded the two types are better supplies for each member.

FOOT WEAR Supplied personally by each member of the expedition.

From my own experience and what was quite obvious after the Logan climb, the following are my personal notes and observations.

FOR ROCK WORK One Pair of short boots and as light as possible in the uppers consistant with requirements. Sole heavy enough to carry edge nails and in the centre short screw calks or hungarian nails. Size to carry one pair heavy and one pair of light all wool socks.

ROCK, BRUSH, SWAMP & MORAINE One Pair of half length boots, nailed as above for use in bush, wet ground and rock. Size as above.

MORAINS AND GLACIERS Low snow in summer, wet: One pair rubber shoepack with leather uppers, half length to take heavy insole and two pairs of heavy socks. Good results obtained when these are leather soled and nailed for very rough and wet going.

VERY HIGH SNOW AND ICE IN WINTER AND SUMMER One pair of very good caribou or deer skin moccasin (dry tan) to take easily four pairs of socks with felt insole. Should be high and well laced. Size 14 for normal size 9.

AROUND CAMP Light leather waterproof slipper with insoles or short rubber shoepack with insoles when weight not a factor.

INSOLES. 2 pairs of thick felt per shoepack or moccasin for glacier and snow, 2 pairs of fiber or cork per boot or shoepack for rock and woods. Carry extras of each when weight will permit.

CRAMPONS Twenty three pairs of crampons and ice creepers taken out, far in excess of what was required.

The main requirements are, one for each member climbing of as light weight as possible consistant with requirements, that is the frame lightly constructed to carry the spikes without bending or breaking the same. Of the five or six different types brought into the field the metal frame would appear the best and most satisfactory. They must above all be carefully fitted to the shoepack or moccasin or where they are likely to be worn. The lamp wick thongs supplied should be replaced with raw hide lacing and arranged so as to be quickly put on and taken off with mits on.

In the case of moccasins these should be worn with heavy large insoles between the bottom of the moccasin and the Crampon, before the latter is tied on.

Note: Crampons are generally hard to secure on short notice. Abercrombi and Fitch sometimes have them, the best however are from any of the Swiss Alpine supply firms such as, again Henry Fuhrer, Gstaad Bermese Oberland Switzerland.

SLEDS AND TOBOGGENS.

In general toboggens are not as satisfactory as the Youkon sled which are 7 feet in length for the best size, two of which were used to advantage on the lower glaciers and on a four mile stretch on the King Glacier at an elevation of 11,000 feet. Conditions have to be carefully studied as very often it happens that in the long run the back packing is infinitely the better thing to do. This is undoubtedly so when the crevassed surface of the ice is such to make going slow and tortuous and on heavy grades and side hills.

The one small toboggen was not a success and would be better replaced with a small sleigh.

The one man sled is often advocated in preference to the sled taking sufficient for three or four ~~toxbex~~pulling, one being on a "gee" pole.

A wide runner (5 inches) brass or steel shod with sled, pin jointed giving a great deal of spring and give, is better than one of rigid construction. Sleds made in the country are the best.

The construction of a sled of drawn durillium tubing was under consideration but found much too expensive.

SHOVEL

A light steel snow shovel with short "D" handle can hardly be left out of an equipment designed to care for expeditions of this sort. The one taken, although being very heavy with a long awkward handle, was taken never the less, to 14,500 feet.

PACKBOARDS, STRAPS and RUKESACKS

The ways and means of packing are constantly changing and ways

and means are constantly being tried out to try and lessen the torture of this indespensible means of transport.

For small packs the Swiss Army Rukesack is undoubtedly the best, consisting of a regular rukesack with pockets fastened to an ingenious metal frame with strap suspension thereby keeping the load free of the back and permitting walking in an upright position in comfort.

For the constant relay heavy packing on the trail the "Washboard" type proved the most satisfactory. Of this type there were two kinds, one in which the canvas is laced across a square frame with cross peaces hollowed for the back and in the other type the whole framework is of light hardwood the whole bent to the section of an arc. The former type permitted carrying heavier loads with greater comfort, the latter very satisfactory for loads up to 40 pounds in weight.

The maximum loads carried on these boards was 100 pounds. Sixty pounds was invariably carried at the high altitudes by many of the party. There seems no set rule regarding the loading, some prefering the load heavy on top while others affirm the only place for the heavy part of the load is near the bottom in the small of the back.

The Parker - Brown pack strap could not be used in packing by any member of the expedition but was found very useful as harness for the sleighs, and are well worth taking in for that purpose alone.

All packs were carried in conjunction with a tumpline fastened to the top of the board and arranged so as to be easily adjusted. The ability to be able to change the load from the head to the shoulders and vice versa or carry it on both equally means much.

The tump line as used crossing short portages on canoe trips is never used in the mountains.

MISCELLANEOUS

The following are necessary:- A shoeing outfit, hob and edge nails, dubbing, lacing for boots and snow shoes. Raw hide, small saldering outfit. Small tool kit with leather punch, sailors palm and needles, wax and thread. Strong cord and twine, leather straps, copper rivets, electric tape, a fabrick glue (Little Bear) etc.,

A P P E N D I X VI.

CLOTHING

Personally supplies by members of the expedition, the following proved to be the best generally speaking. Those with experience can change this list slightly to advantage when sure of what is needed.

Head: felt hat, knitted helmet with silk lining.

Hands: Woolen mit with separate caribou leather cover, long cuffed gauntlet at least 4 inches above wrist drawn by elastic or strap in at the wrist, of heavy flexible material or dry tan light leather, wool lined or used with separate wool glove with long wrist. A fur gauntlet on a tape found very good.

Feet: See under alpine equipment.

Underwear: Three sets of combination, all wool, medium weight, one heavy all wool as above, one light all wool as above, A saving in weight and greater utility is to use a suit of underwear in lieu of pyjamas.

Shirts: One "Cruiser" shirt with pockets, one Jersey all wool shirt, Two light army flannel.

Sweater: One woolen knit with roll collar.

Trousers: Two khaki long duck, worn with suspenders, one tweed knickerbocker.

Socks: For high altitudes two sets of four pairs knit in gradually increasing size so that four can be worn without tightning on preventing the foot, thereby restricted circulation. Knit in four colours to distinguish the four different sizes. Six pairs all wool medium weight, two pairs golf stockings.

Small wear: Handkerchiefs, silk or woolen scarf, garters, belt, suspenders, toilet articles, tooth powders (not pastes) etc.,

With the Cruiser shirt a coat is considered unnecessary. The Parka

which is waterproof and flexible is carried in lieu of a waterproof coat. The whole secret of equipment being to get the simplest possible consistant with comfort and weight.

APPENDIX VII.

STOVES AND FUEL

STOVES The two types used on the expedition were gasoline burners of the blower type. The primus, was the only type taken beyond Cascade camp. On account of its lightness this stove still remains the best for all high altitude work. It functioned in air pressures one half normal pressure and gave but little trouble. The other type, which is a two jet stove is the "Coleman".

Number taken	Type of stove	Wt. without oil	Consumption. hours burning per Imperial Gallon
2	Coleman	17½ lbs	21.3 hours
6	Primus	2¾ lbs	32.0 hours

The actual consumption of gasoline while on the mountain averaged one gallon per day.

Utensils of aluminum were used which best fitted and were the most convenient with the type of stove to be used, but no particular construction was considered necessary to try and conserve heat or to use insulated shields for the same purpose in any way. The stoves were always perfectly protected in the tents.

Two primus stoves did all the cooking at the higher levels without difficulty although taking up a good deal of time.

One of the most aggrevating problems was the difficulty in getting enough water from melting snow. A better constructed boiler than an ordinary large three gallon tin pail, should be carefully worked out. The stoves ran for hours each day on this one business of melting snow.

Care should be taken in having spare generators and burners together with the necessary cleaners, in case of failures or accidents.

FUEL Gasoline only used, 45 gallons taken in, with 20 gallons left over from the winter freighting operations, gave a total of 65 gallons which was greatly more than was required.

Twenty eight (28) gallons only were carried above Cascade Camp which proved ample for the time spent on the mountain (June 3 - 28).

A weight of eight lbs to the gallon in the can has to be allowed.

The forty five gallons were covered in the following way:-

30 - one gallon cans (screw tops)

48 - one quart cans " "

24 - one pint cans " "

NOTE: Our standard size of can would have been better all around with exchangeable nipple with spout for pouring.

APPENDIX VIII

TENTS, ROBES, MATTRESSES

TENTS

A total of sixteen tents were actually taken in. Three light silk 7' x 7' with floor and ventilators, single bamboo pole with 30" cross peace, taken in by the American members of the party. Four light "Mummery" one man tents weighing three pounds each were taken but not used. It was considered that on the upper plateaus they would be more economical in weight than larger ones. They do not as a rule permit of enough room and are very awkward and uncomfortable to move around in. Their great advantage/however is to have them to carry (if weight will permit) in cases of emergency where it might mean saving of life. They were not taken beyond 14.500 feet but if they had been available on the night of June 23 - 24 they would have been of great value.

Three large ridge tents used at Cascade Camp and at lower points for perminent canhes and cook tent.

Six "Logan" tents specially constructed, and found eminently satisfactory, They can be slightly improved by leaving off the outside ridge cloth used to hold down the edges with snow. These invariably froze to the ground and soon tore off in taking the tents down. Snow occasionally blew in at the back ventilation windows. The one centre pole required was 7½ feet long in three sections of drawn seel.

Specifications of these tents are:-

Size 7 x 8 x 7½ feet high, sewn in floor, brown mineral die, waterproofed and mildue proof.

Weight	14 lbs
Jointed pole	2½ lbs
Bag	1 lb
	17½ lbs total weight.

The total cost of this tent made by the Woods Co., Ltd., being $ 57.75.

TARPAULINS Two 12' x 14' - 10 ozs waterproofed sheets were usen to advantage for large tent floorings, after being used as covers for the caches. These of course were not used beyond the Cascades camp.

EIDERDOWN ROBES. One complete robe supplied to each member of the expedition made by the Woods Mfg. Co., Ltd., on special specifications. These robes were designed so as to be taken apart and could be made into two if required or the weight reduced when weight was the prime factor. The cravanetted outer silk cover contained two eiderdown fillers between it and the blankets lining, one of which was fixed perminently to the cover, the other attached to it by means of tapes, could be taken out at will. This detachible filler weighed by itself five pounds and when used in conjunction with the 8 x 8 waterproofed outer cover made an excellent bag by itself. The inner lining of the bag was a camel's hair blanket and although this increased the weight of the bag from 1½ to 2½ pounds the change from the usual cursey lining proved well worth while. The bags, so called, consisted actually in a straight blanket ninety inches square fastened along the edges by press fasteners; if desired also, these robes could be fastened together making a quilt in which four could be accommodated in two robes (one above and one below). By this means the weight was greatly reduced per person. This actually happened above the 14,500 foot level where as well, the eiderdown fillers had been removed, reducing the actual weight to 10 pounds a person (4 sleeping in the two robes.) The party slept in this way from the 13th to the 26th of June during which period the coldest weather was experienced (33° F. below zero) As a general rule we slept warmly but with all our clothes.

Specifications for Robes:-

Size 90" x 90" over all.

Weight only $16\frac{3}{4}$ to $18\frac{3}{4}$ pounds which included the five pound filler in each case. Due to the different weights of the camel's hair blanket, the robes could not be made uniform in weight.

Average cost $ 98.68

ROBE COVERS To serve as a waterproof covering and to protect the robe while in transit and as well to act as a cover to make an additional robe (with the detachible eiderdown filler) a waterproofed oil silk sheet, was provided with each robe.

Specifications for sheet:-

Size 8' x 8'

Weight three pounds

Cost $ 10.24

The gross weight of the robes were therefore from $19\frac{3}{4}$ to $21\frac{3}{4}$ pounds each and the total cost of each $108.92.

AIR MATTRESSES These proved of priceless value and were taken to the last camp, four also used at the highest camp on the continent. (18,500 feet above sea). Contrary to reports received these mattresses never had ice form in them and they were inflated without difficulty with large barrelled light tin pumps.

One mattress was supplied for each person, which however, above the Cascade camp, was reduced to two mattresses to four in a tent, the mattress being used cross wise.

Specifications of Mattress:-

Size about 30" x 84"

Weight (without pump) $7\frac{3}{4}$ pounds.

Cost (without duty) $ 19.70

APPENDIX IX.

PROVISIONS Total provisions with the exception of a very small quantity brought in with the expedition for Mr. Laing at Hubrick's camp (at the head of the Christina Valley) and for the party going in, was all delivered on the grouns by the winter freighting party operating between McCarthy and the Advance Base Cache ("A, B, C") during February, March and April, 1925.

The modus operandi in general was to place caches along the line of march to make it possible for the expedition walking in from "Trail End" each night to arrive at one of such caches where would be found provisions for one day leaving one day's provisions for the journey out.

At Hubrick's Camp a week's supply was provided, being the end of the back packing off the glaciers and the commencement of the journey down the Chitina River.

The main problem, however, was the placing of the main cache. Mr. Mac Carthy eminently succeeded here in exceeding expectations and very successfully establishing this cache seven miles up the Ogilvie Glacier where the cache was made on the open morains opposite Mussell glacier.

At the junction of the Logan and Ogilvie glaciers a point called by the Boundary Surveys "Turn", a cache was also made having in view a possible side trip (after the climb) up to the head of the Logan glacier into territory hitherto unknown. When "Turn" was reached on July 1st on the homeward journey the party of six were in no physical state to undertake such a journey.

THE DETAILS OF THE CONTENTS OF THE INTERMEDIATE CACHES ARE AS FOLLOWS:

CACHE P	10 men for 10 days - Pack train going in and coming out between MacCarthy and Hubrick's Camp.
T	10 men for 7 days at Hubrick's Camp to enable the building of boats on the return journey.
K,L,M	Three caches for 10 men for two days each, placed at the end of day's marches, along the Chitina, Walsh and Logan glaciers. K is at Chitina point at the junction of the Chitina and Walsh glaciers, L at the Fraser - Baldwin Cache at the commencement of the Walsh glacier and M on the open moraine of the Logan glacier near the boundary.
H	10 men for 7 days for emergency and contemplated Logan glacier exploration at "Turn".

INTERMEDIATE CACHES. DETAILS OF CONTENTS.

	K.	L.	M.	H.	T.	P.	TOTAL
Bacon	6	6	6	14	14	18	64
Ham	-	4	4	10	10	12	40
Veal Loaf	3	3	3	6	6	8	29
Sausages	6	6	6	12	12	10	52
Sardines, doz.	1½	1½	1½	2	4	-	10½
Cheese	2	2	2	5	5	5	21
Butter	2	2	2	10	10	12	38
Eggs	2	2	2	6	6	6	24
Pilot Bisk,	5	5	5	12	12	12	57
Flour	-	-	-	25	25	49	99
Flap Jacks	5	5	5	10	10	10	45
Corn Meal	1	1	1	5	5	5	18
Baking Powder	-	-	-	1	1	2	4
Yeast cakes				1 pk	1	1	3 pks.
Rolled Oats	2	2	2	5	5	8	24
Rice	4	4	4	12	12	20	56
Granulated Potatoe	4	4	4	10	15	15	52
Dried string beans	2	2	2	4	4	4	18
Dried apples	3	-	-	5	5	5	18
Dried Apricots	4	4	4	10	10	10	42
Dried peaches	2	2	2	5	5	5	21
Dried raisins	2	2	2	5	5	5	21
Marmalade	-	-	-	4	4	4	12
Strawberry Jam	2	2	2	4	4	4	18
Klim	2	2	2	4	4	6	20

PROVISIONS (continued)

	K.	L.	M.	H.	T.	P.	TOTAL
Sugar	4	4	4	14	20	20	66
Salt	½	½	½	2	2	4	9½
Pepper	1/8	1/8	1/8	¼	¼	¼	1 1/8
Tea	1	1	1	2	3	4	12
Coffee	1	1	1	4	4	5	16
Cocoa	½	½	½	2	4	3	10½
Ovaltine	½	½	½	2	2	2	7 ½
Bovril	¼	¼	¼	½	½	½	2¼
Cristo	-	-	-	1	1	1	3
Mapeline	-	-	-	¼	¼	¼	¾
Mustard	-	-	-	¼	¼	¼	¾
Bags of Beans	-	-	-	5	5	5	15
Split beans	-	-	-	8	8	8	24
Matches	1 bx	1	1	3	3	3	12
T.P.	1	1	1	3	3	3	12
Soap	1	1	1	2	2	2	9
Gr. Cinnemon	-	-	-	2	2	2	6 ozs.
Gr. Cloves	-	-	-	2	2	2	6 ozs.
Gr. Ginger	-	-	-	2	2	2	6 ozs.
Gr. Nutmeg	-	-	-	2	2	2	6 ozs.
Vegex	1	1	1	2	2	2	9
Vita food	1	1	1	2	2	2	9
Dr. Hor. Radish	-	-	-	2	2	2	6
Total Weights	107	107	102	298	328	383	1325

Totalling all cash and carry 1325 practically 30 days 10 men.

ADVANCE BASE CACHE, ESTABLISHED AT 7000 FEET ON THE OGILVIE GLACIER, 45 MILES FROM THE TOE OF THE CHITINA GLACIER AND 133 MILES FROM THE RAILWAY AT MCCARTHY.

NET WT.	10 Men. 60 days.	GROSS WT.
200	Bacon best c/8	210
46	Ham, boiled and boned	46
48	Sausage, Vienna, 24 / 2 S	60
78	Chicken, boned 48/ 13 ozs.	90
75	Sardines 300 / ¼ #	85
12	Veal Loaf 24 / ½ #	20
24	Corn beef 24 / 1 #	30
48	Pork and beans Van Camp 48 / 1 S	50
30	Cheese (Kraft American) 30 / 1 S	32
561	Total meats exclusive of special for climb.	
100	Butter, beat, Creamery 100 / 1 S	106
9	Crisco, 6 / 1½ #	11
70	Flour, white 7 / 10 S	75
18	Corn meal 2 / 9 S (yellow)	20
40	Pancake flour, Pillsbury 24 Sm. pk.	44
80	Rice, head 8 / 10	85
147	Pilot biscuit, 7 Cs. of 24 / 14 oz.pkgs	175
25	Ginger snaps, 3 Cs.	35
6	Corn starch, 6 / 1 S	8
54	Rolled Oats, 6 / 9 S	60
10	Wheat Flakes, 2 / 5 S	12
16	Macaroni, 32 / 8	18
10	Split Peas, 2 / 5	11
5	Pearl Barley	6
10	Dried beans 2/5	11

PROVISIONS (CONTINUED)

ADVANCE BASE CAMP

NET WT.		GROSS WT
12	Buck wheat 3/4½	14
225	Sugar, Granulated 7/25, 5/10	232
50	Sugar, Brown, 10/5S	53
16	Marmalade Dundee 4/4	20
60	Plum Jam, 12/5	65
72	Strawberry, 36/2#	80
25	Prunes, (60/80 Size) Pitted 1/25	27
"	Apples, 1/25	
"	Apricots, 1/25	
27	Peaches, 1/25	
	Figs,(Omitted from provisions in error)	
24	Raisins Seedless 25/15	30
12	Dates, pitted 24/8	13
48	Milk Borden's, 48/1	69
12	Milk, Eagle, 12/1	18
26	Tea, black, Gold shield, 26/1	32
20	Coffee, Gold shield 10/2	25
15	Cocoa, 30/8 oz.	17
20	Salt, fine table 4/5	23
½	Pepper, black 4/2 oz.	1
½	Mustard, Coleman's 2/4	1
3	Mustard, Gulden's 6/8	4
12	Baking Powder, 12/12	15
1	Yeast cakes, Magic 6 pkgs.	1
1	Soda, A & H. 1/1	1
	Pickles (Sweet) 2/2½	-

PROVISIONS (CONTINUED)

ADVANCE BASE CAMP

NET WT.		GROSS WT.
5	C.H.B. Dill,	7
2	H.P. Sauce, 4/7½ oz.	3
2	L.P. Sauce 4/5 oz.	2
1	Vanilla extract 2/2 oz.	1
1	Lemon extract 3/2 oz.	1
1	Mapeline, 3/4 oz.	1
7	Mince Meat, 12/9 oz.	8
	Curry Powder, 2/2 oz.	
	Horseradish, 12/1¾ oz.	
	Toilet soap, tar, 6 cakes	
6	Toilet soap, Pears, 6 cakes	
	Laundry, Polar White Star, 8 cakes	10
	Toilet paper, 24 rolls,	
	Matches, 1 tin, 6 box.	
3	Candles (14 Oz.) 3 doz.	
1870	Totals	2073
1898	A.H. McCarthy's figure.	

CONCENTRATED ARTICLES

SPECIALLY FOR HIGH CLIMBING IN ADDITION TO LIST GIVEN ABOVE.

20	Chicken, 2 Cs. 24/13. College, 1 M.	25
8	Bovril, 32/4 oz.	10
27	Vierma Sausage, 48/9 oz.	27
20	Erbswourst, 80/4 oz.	25
20	Plum Pudding, 10/2	23

PROVISIONS (CONTINUED)

ADVANCE BASE CAMP

NET WT.		GROSS WT.
46	Eggs, Keith's, 46/1 S	50
60	Potatoes, granulated, 12/5	70
10	Carrots,	10
6	Cranberry, 6/1	8
34	Klim, 34/1	50
5	Malted Milk, 5/16	6
7	Walnuts, meats, 10/8oz.	8
5	C.H.B. Pickles, 2/2½	5
15	Chocolate Milk, 15/1 S	16
6	Ovaltine, 12/8 oz.	7
6	G.W. Coffee, 24/4 oz.	6
1	Citric Acid	1
24	Vita food, 648 pgks.	25
36	Vegex	38
20	Cuve Sugar	20
1	Assorted spices, 5/2 oz.	1
377	Total	431

Total Weights

Intermediate caches (10 men, 30 days)	1325
Brought in big expedition to Hubrick's camp for Government Biologist, extra.	200
Adcanve Base cache	1898
Advance Base cache, special, concentrated	372
40% allowed for containers	1388
Total	5183

APPENDIX. X.

FINANCES

RECEIPTS — Private and public receipts as follows:-

Member's Subscriptions:	
Individual	
Canadian	$ 2357.92
English	463.72
United States	854.00
SECTIONS	
Vancouver Island	50.00
Vancouver	239.00
Calgary	83.65
Edmonton	122.00
Regina	35.00
Saskatoon	15.00
New York	640.00
Sundries	
Alpine Club (England)	476.00
Royal Geographical Society (England)	500.00
Alpine Club of Canada	1500.00
American Alpine Club	1919.19
B.C. Mountaineering Club	25.00
Rucksack Club	13.00
Mrs. A.H. MacCarthy	1000.00
Can. Pacific Railway	1000.00
H.F. Lambart, Magazine article,	800.00
Vancouver Daily Province	500.00
Woods Manufacturing Co.,	200.00
	$ 12793.48

All of which was expended on behalf of the expedition with the exception of a small balance as follows:-

SUMMARY OF EXPENDITURES TO DATE

Organization: Meetings, press telegrams, stationary, printing, office expenses of all kinds.	971.27
Travelling expenses to and in Alaska and freight	1105.04
Preliminary equipment	2521.92
Food, wages, supplementary equipment,	7496.27
Refund to A.H. MacCarthy for reconnaissance expenses	600.00
Balance in Bank for sundry contingent expenses	98.98
	$ 12793.48

Added to this total, account must be taken of the assistance rendered by two branches of the Federal Government. The total outlay, (exclusive of salary) of the Department of the Interior (Geodetic Surveys) which includes cost of equipment which was impossible to salvage after the climb, is - $ 1675.09

The total outlay of the Department of Mines on behalf of the Expedition through its contribution of a Biologist in the person of H.M. Laing and film used by him amounting to 4000 feet was (appropriation) $ 1850.00

16318.57

This total does not take account of the personal expenses incurred by Mr. MacCarthy on the Reconnaissance trip of 1924 which cost $ 1.576.94 of which only $ 600.00 was paid back by the Club or the personal expenses incurred by each member of the expedition which in the case of Messrs. Carp, Hall and Read were quite heavy.

APPENDIX XI

TECHNICAL NOTES ON THE CLIMBING OF MT. LOGAN BY BELMORE BROWNE.*

The following notes are to be used in collaboration with those prepared by Major E.O. Wheeler. Any differences that may occur between his report and mine may be explained by the brevity of his notes and to the fact that we have not been able to meet and compare our experiences. As I am not as yet informed as to the number of men to be included in the Canadian Alpine Club Expidition, the following notes are based on a party of four climbers with a rear-guard of one or two men at the base camp.

CAMPS If the C.A.C. Expedition intends to use porters, or "packers" as we call them in the Rockies, the details of their camps will be somewhat complicated. The experiences of five summers spent on the glaciers of the Alaskan coast ranges, without the aid of packers, or guides, has taught me that the "paid man" of the independent type found on our frontiers rarely endures the hardships and inconveniences of glacier life with the philosophy of a trained amateur. More tent space is needed for a party using paid men than would be required for a like number of amateur climbers. On the 1910 Mt. McKinley Expedition we spent fifty consecutive days on the ice. One 10 x 12 wall tent formed our base camp. The climbing party of six men was divided into two units of three men each, and each unit was equipped with a complete outfit of its own. Two mountain tents of my own design (see notes on Tents for particulars) with a floor space of only $7\frac{1}{2}$ x $7\frac{1}{2}$ feet, gave us all the necessary protection, but it is doubtful if so limited a tent space would be satisfactory if paid men were included. On more than one occasion four men occupied one tent for a period of one week or more, all of them sleeping and cooking in this small space. This fact is of the utmost value in showing what may be done under the spur of

* Belmore Browne , Artist ,Banff Alberta was member of the Dr. Cook ,McKinley expedition and of the Parker - Browne Expedition of 1912.

necessity, for the tent weighed only eight pounds, including the jointed pole, which was made of solid wood with heavy metal reinforced joints. If the climbing party consists of only four men, they must of necessity travel as one unit, (see notes on travel) but two tents will still be necessary, and although weight is of paramount importance, it would be unsafe to reduce the tent floor-space less than $7\frac{1}{2}$ x $7\frac{1}{2}$ feet for the reason that an occasion may arise when it will be necessary for more than two men to sleep in the same shelter. All travel will be done according to the relay method, and in relaying it is often necessary to have a tent at each end of the day's march, in case of injuries, or storms.

The snow on the Logan glaciers in the spring will be, at times, exceedingly wet, and before making camp it will be found advisable to remove the top layer of snow. After the second Mt. McKinley Expedition I decided that the use of snow-shoes, etc., for shoveling caches and tent sites was unsatisfactory and inefficient, and on the 3rd Expedition we carried a long handled shovel and found it invaluable. On two occasions the success of our trip depended on our ability to dig deep tent sites when conditions forced us to camp on steep snow slopes. We carried the shovel to our highest camp at nearly 17,000 feet.

Even when the top snow had been removed we found it advisable to tread down the tent site with our feet, including an area around the tent large enough to hold the dunnage that was not taken into the tent.

I agree with Major Wheeler's advice against rushing a peak. With the equipment described in the following notes, it will be possible to camp wherever snow of a depth of six feet is found, and Mt. Logan

is well covered with snow. I have studied Mt. Logan from the West approach with a view to climbing it. The Western face showed good snow from the base to the summit. This was in the months of April and May, over a period of several years. The camp equipment should be moved towards the summit until the summit is within certain reach.

TENTS Never having used, or seen the Whimper, or Mummery tents recommended by Major Wheeler, I can neither criticise them nor recommend them, but as the tent I use was evolved from three years experience on Mt. McKinley and many glacier experiences in the Gulf of Alaska, and as the many men who have used the tent have been unable to criticize any detail, or to suggest an improvement, I hereby take the liberty of urging its use by the C.A.C. Expedition.

Following is a brief description of the tent.

Weight: The final tent which I designed after two attempts on Mt. McKinley, weighed eight pounds, with an unnecessarily heavy pole.

Size: The tent can be built as large as needed. The tent mentioned above was 7 feet in height, with a floor space of $7\frac{1}{2}$ x $7\frac{1}{2}$ feet. On our last expedition it sheltered three men for thirty days. All the camps were on ice or snow.

It is wind, snow, and rain proof.

The door is rain, and mosquito proof, (an important item in the Logan region). The floor, which is a part of the tent, is practically proof against the see-page of snow or ice, even when walked upon.

Strength: We had winds of terrific violence on the upper snowfields. On occasions the noise of the wind on the tent walls

was so loud that we could not talk without shouting, and yet no damage was ever done. I have used this tent every summer since our last Mt. McKinley Expedition, (eleven years) and to date it has never required mending of any kind.

Ventilation: Three members of the 1910 Mt. McKinley Expedition were rendered unconscious for a long period, by generation of carbon monoxide gas. The gas was formed by breathing, and the flame of a vaporized alcohol stove when the tent was glazed with a solid coating of ice from a four days' blizzard. The present tent has a ventilator that can be adjusted by the pressure of one hand.

The man who made the tent is still a tent maker in New York City. The present price of the tent is forty dollars. The tent can be erected in about three minutes (average).

BEDDING Eider sleeping bags, as recommended by Major Wheeler are excellent. As it loses its efficiency when damp, the addition of a single bag of Yaeger blanket keeps the eider quilt from tearing, and absorbs the moisture from the body.

The 1910 Mt. McKinley Expedition was equipped with this type of bag and they were perfectly satisfactory, but the altitude reached was only eleven thousand feet. On the 1912 Expedition we used the regulation fur sleeping bag used by the Alaskans on winter trips, and there is no doubt that for rough work such as mountain climbing, they are far superior. There are two reasons: strength, and the fact that they are more easily kept free from moisture, which means warmth. Our bags were made of different varieties of fur, and the list which follows is given in the order of their usefulness. Alaskan white mountain sheep, this bag was eight feet long, unlined, and about four feet wide at the opening, tapering toward the foot.

Summer reindeer bag, constructed by Anthony Fiala, Rogers Peet and Co., New York City. Black wolf bag, very warm but too heavy. Australian wombat bag, not very good. The wild, white mountain sheep bag was exceedingly light and extremely warm. All these bags were superior to Eider bags, for hard service, with the one exception of weight, Bags made of the skins of the mountain goat are useless for hard wear, and they mat and are difficult to dry. The coldest weather experienced by the 1912 Mt. McKinley Expedition was 23 degrees below zero, but it must be remembered that from fourteen thousand feet upward there is very little bodily heat. Above twelve thousand feet we found it very difficult to sleep on account of the cold. Carstens, leader of the 1913 Mt. McKinley Expedition is a native Alaskan with a life-long experience on winter trails. His experience in high altitudes agreed with ours, for he stated that at a zero temperature at fifteen thousand feet was as bad as sixty degrees below xero at sea level. Mt. McKinley must average a good many degrees colder than Logan, as it is close to the Artic Circle, but I would urge every member of the Mt. Logan expedition to take every precaution towards bodily comfort, (without over doing it) lest they become a drag on the Expedition. For the benefits of the members of the Expedition who have not camped at high altitudes, I will state the list of clothing worn by the writer at night, at altitudes above twelve thousand feet on Mt. McKinley. Two suits of wool under clothing, two pairs of the heaviest wool sleeping socks, one regulation woolen shirt, (heavy), one extra heavy woolen shirt ("Timber Cruiser's shirt, made by Filson, Seattle,") one pair heavy wool knicker-bockers, one pair of heavy overalls, sleeping moccasins, one sweater, fur cap tied down tight, silk muffler wrapped around neck, neck muffler, wool, wrapped around abdomen outside of clothing, heaviest wool mittens covered with soft-tanned moose hide mittens.

On exceptionally cold nights an Alaskan Parka in addition to the above. After getting into the sleeping bag, it was necessary to exercise steadily, turning and working every muscle, for twenty or thirty minutes before one began to feel warm.

Major Wheeler recommends a cork or pneumatic mattress, and while they would undoubtedly add greatly to one's comfort, the difficulties of transportation on Mt. Logan will probably rule out this added weight. (See notes on Transportation.)

COOKING ARRANGEMENTS

After long experience and careful experiments, we ruled out Sterno, as being too wasteful, and Primus stoves, as being too heavy, for Mt. McKinley conditions. We used a small type of alcohol stove which weighed about one pound. Its mechanism was somewhat similar to that of a Primus. The body of the stove held the alcohol, which was drawn up by a wick that was covered with a perforated metal tube. At the base of the tube there was a slight depression which would hold about one tablespoon of alcohol. The depression was filled by pressing a metal plunger which pumped the necessary amount of alcohol through a small tap. The alcohol in the depression was then lighted and as soon as the metal tube became warm it vaporized the alcohol drawn up by the wick, which burst into a steady blue flame. We used one of these stoves in each tent, and during the four years we used them, I have never known one of them to leak, or to require cleaning, or attention of any sort. Were the question of weight secondary, I would prefer the Primus, as it gives more heat.

All fuel should be carried in small screw-top cans. In laying stress on this important point Major Wheeler suggest the use of two gallon cans.

Having suffered frequently from the loss of fuel, I have become even more conservative. One must keep in mind that a leak in a can may mean the loss of the entire contents, and the loss of two gallons might be a very serious matter.

On the last two Mt. McKinley Expeditions we carried our fuel in pint cans, and to my mind this is the most satisfactory, as well as the safest, size.

I have never found drinkable water on the Alaskan glaciers above six thousand feet. This rule may not hold on the eastern slopes of Mt. Logan, but the Expedition must be prepared to use melted snow. We never used water or any drinkables between camps, and this rule, which I believe to be a wise one, freed us from the encumbrances of canteens, or water bottles.

The question of cooking utensils depends entirely on the type of food used, (See notes on Food), and as this question is still problematical, it will be taken up later. Thanks to the extreme simplicity of our diet on the McKinley climbs, our only cooking utensils were one aluminum pail for tea, and the cups we drank from, and in regard to aluminum, it must be remembered that this metal should never be used for drinking cups on long expeditions, as it will remain unconfortably hot after the liquid it contains has cooled.

FOOD This one short word covers the success or failure of any difficult feat of mountain exploration, for the difficulty of transporting food stuffs invariably becomes a greater problem than the scaling of a peak.

The food question, therefore, becomes one with the problem of transportation and in the following notes it is my purpose to

speak on this question from the point of view of one who has been forced to do without paid helpers. Perhaps it may be of help if I begin with an explanation of the rations of the last two McKinley Expeditions, for our food list actually touched the minimum that would support life. To the best of my knowledge, the last two McKinley Expeditions were the only difficult mountain climbing expeditions to subsist on pemmican. The pemmican was made by the Armour Co., of Chicago. Our rations, and they were rigidly enforced, (See notes on Personnel), consisted of one pound of pemmican per man, per day, three or four hard tack biscuits, about six teaspoons of sugar, and tea, ad lib. In addition we carried a moderate supply of raisins, but they were not issued regularly, as they were held for the final and most difficult work. We lived for fifty days on this ration in 1910, and the labor performed was as arduous as any recorded in mountain exploration. In one respect Fate played us an unexpected prank; the highest altitude reached by the Expedition was about eleven thousand feet, but as we kept in good physical condition throughout, we naturally concluded that pemmican was the ideal diet for difficult mountain work. In 1912 we acted on this theory, only to discover that the pemmican was useless above twelve thousand feet. From that point up to twenty thousand feet we were forced to live on tea, sugar, hard tack and raisins.

The knowledge we bought so dearly was that, for its weight, pemmican is an ideal food below an altitude of eleven thousand feet. From that point upward, the lighter tinned meats, such as chicken and tongue, would furnish the necessary heat and strength without upsetting the digestion, and the tinned beans, as prepared by Armour and Co., would undoubtedly prove satisfactory. As hot water is literally worth

its weight in gold at high altitudes, the heating of tins would necessitate an extra stove, or burner, and it would be advisable to remove all paper and glue from the tins at the base camp, so that the water in which the tins are heated would still be fit for drinking. After many years of experience on Alaskan glaciers I have concluded that the round, hard tack biscuit, is the best bread food for mountain work. It should be carried in large water tight cans, as it is then practically indestructible, and there will be no waste. The use of nothing but raisins in a mistake, dried prunes (the best are prepared by a company in Portland, Oregon) and dried apricots would keep well and would give variety to the ration. Sugar is, of course, a necessity and it must be remembered that under the terrific strain of high climbing, the desire for sugar grows on every man, and with some, becomes an obsession. This fact must be reckoned with, in outfitting the expedition.

There is an old saying among Alaskans to the effect that " a cup of coffee for breakfast will take five miles off a day's travel". While the saying is, of course, an exaggeration, many years of experience on the Northern trails has convinced me that it contains more than a germ of truth. As one travels northward from the Equator the drinking of coffee steadily decreases, and the drinking of tea increases. Whether this fact is convincing or not, the fact remains that tea is far superior to coffee, when men are engaged in hard labor on Northern trails. Furthermore, its weight is negligible, whereas coffee is difficult to transport, and tea is far more easily prepared than coffee.

With these facts in view I have never permitted the use of coffee on expeditions that I have commanded, for the food must

be chosen and rationed for the good of the whole party, and unless each individual is prepared to stand loyally by this rule, trouble of some kind is sure to result. (See notes on personnel).

I am of the firm opinion that the use of sweetened chocolate on difficult mountain explorations, is a mistake, and does more harm than good. In case of fatigue there is nothing that will reinvigorate an individual, or a party, as quickly or lastingly as a pot of hot tea. A small flask of brandy may be very useful in an emergency, but it should only be dispensed on special occasions.

PERSONAL KIT Wearing apparel for glacier work along the Alaskan boundary has been thought, and tried out thoroughly by the prospectors and hunters who have lived for long periods in that region. In many ways the region differs from the better known Alpine regions. A very heavy snow fall and great humidity are the outstanding features, and these conditions require special outfitting methods. Leather shoes are useless on these glaciers. Firstly, they would wet through and then freeze solid in the sudden drops of temperature, and lastly they cannot be used with snowshoes, and snowshoes are a necessity. The rubber shoepack, with a six or eight inch top form the best footwear for these conditions. Three pairs of woolen sox should be worn inside the shoe pack, but less will do where an insole is used. The rubber shoepack requires no attention; no oiling is necessary, and it can be put outside at night without danger; it can be used with snow shoes, and is not a bad climbing shoe except on difficult rock, or smooth ice. Where really difficult ice conditions are encountered, the leather shoe would be equally dangerous. There is an ice-creeper, or crampon, perfected by the Apalachian Society that is superior to any other type. It is constructed so that wet snow will not

stick to the sole, or "ball up", and there is no danger of freezing the feet, Worn over the shoe pack it is an ideal climbing shoe for difficult snow or ice. On Mt. McKinley we changed from rubber shoe packs to moccasins at about fifteen thousand feet, and used the above ice-creeper over our moccasins. On Mt. Logan this change would not be necessary, as the rubber shoe pack would be perfectly comfortable for Logan temperatures. Sleeping moccasins are so useful that they can be listed with the necessities.

Wet snow, being one of the curses of glacier travel, necessitates outside clothing that offers the least encouragement for snow to stick to. Nothing sheds snow better than the common overall. Heavy underdrawers underneath, or two layers of medium under clothing for very cold weather, give the necessary warmth. Spiral puttees wrapped around the overall from the knees down prevent any snow from entering between the shoe and the clothing, and helps to keep the tents free of melted snow, which helps a lot when a number of men are going in and out of a small tent. Strongly woven wool caps are probably the most satisfactory where weight carrying is done by the climbing party. A hat with a brim is uncomfortable when a "tump-line" is used, and if heavy weights are carried, a tump-line is a necessity. The wool cap is also worn while sleeping, when the weather is cold. Each man should carry two heavy wool shirts. They are superior to sweaters, and serve the same purpose. A good woolen muffler is necessary. Two pairs of heavy wool mitts, and two pairs of heavy leather mitts are a necessity. The leather mits are worn outside of the wool mits. Each man should carry six or seven pairs of heavy, well woven socks. One or two pairs are kept clean and fresh and used for bed-socks.

Snow-blindness is a real danger on the Logan snow fields. The very best goggles procurable must be taken. The goggle should be made with a metal screen eye socket, or the sweating of the glass will render them useless. A half pint bottle of a solution of boracic acid and cocaine for treating snow-blindness should be included in the medical kit.

The entire personal outfit of one man should fit into one water-proofed dunnage bag, (including sleeping bad). The bag should have a strong strap on the bottom. It should be packed cross ways, on the back, the tump-line running to each end. No man in the expedition should be allowed to carry more personal belongings than his companions. (See notes on personnel).

TRAVEL All travel, when the actual approach has begun must be accomplished by the relay method. When occasion warrants, a scouting party, or individual, must choose the route. Long experience and natural ability are needed for this important work. If the leader feels that some other member of the party is a better trail breaker than he, he should instantly take second place, for nothing will cause more friction, or righteous anger, on the part of the weight carriers, than being needlessly lead over an unnecessarily long, rough, or steep route. If the trail chooser is forced to lead when the party is carrying heavy packs, he should instantly halt the party and give them a chance to rest, whenever he is uncertain concerning the best route and desires to make a reconnaissance. The usual method of trail breaking in unknown country fits in perfectly with glacier travel. The trail is broken by an individual, or a lightly loaded party. In the spring when the snow is soft the beaten trail freezes very hard at night and forms a good surface for packing the heavy loads.

As soon as the party reaches glacier ice, the possibility of crevices changes the order of travel. Four is the smallest number that can travel the Alaskan glaciers in perfect safety. The tremendous size of the crevasses and the treacherous way in which the heavy fall of snow covers and bridges them, is the principal reason for taking unusual precautions. Only the best rope should be used, and a rope for a party of four men should be long enough to allow for twenty-five feet lengths between each man. A liberal supply of extra ropes should be taken. There are two accepted methods of transporting freight under glacier conditions. The best method is with dog teams, the second by back-packing. Where dogs are used the trail is broken by a reconnaissance party, or, if the crevasses permit, by one individual. On the 1912 McKinley Expedition we handled our own dogs, but this requires experience, and if a party has not used dogs before, it would be necessary to hire two dog teams and two experienced drivers. Pulling sleds by man-power, rarely, if ever, pays. Back packing is an art in itself, and as dogs can only be used as far as the actual base of the mountain, back-packing must eventually be resorted to. The loads of the McKinley Expeditions ran from forty pounds, on the actual climb, to one hundred pounds on the lower slopes. During difficult reconnaissances it is sometimes necessary to carry less. For heavy loads the rucksack us utterly useless, but it can be carried inside the dunnage bags, as a personal kit bag. The Mc Kinley expeditions used a pack strap of my own design, and long experience has proved that for work of this kind it has no equal. (Design will be furnished if desired.) The tump-line is a necessity for heavy packing. In glacier travel the old saying is:" familiarity breeds contempt", must beguarded against. Constantly toiling backward and forward over a cer-

tain stretch of trail soon robs it of its dangers. If there is any danger vigilence must never be relaxed. In our early experiences on the McKinley glaciers, which are exceedingly treacherous, we escaped serious accidents by good luck rather than by good management. Long stretches of trail what we considered absolutely safe, would, after a few weeks of warm weather, disclose numbers of deep crevasses. Numbers of such crevasses are filled by rushing torrents, so that if a man falls into one, while packing alone, or if the rope should break from the fall of a man weighed down by a heavy pack, he would be swept to instant death. Thousands of unrecorded accidents have occurred on the Alaskan glaciers, and I personally have seen a number, with the result that I consider the approach to an Alaskan peak more dangerous than the actual climb. The Western approach to Mt. Logan would be over this type of ice, but the Eastern approach would be over smaller, and less dangerous glaciers.

In lowland travel, it is wise to make long relays, and keep the camp between the relay stations, but on the ice it is wise to make short relays and to keep the camp at one end of the relay line. By this method each individual possesses a better knowledge of the trail, and the chances of an accident are lessened. There are other obvious advantages to be gained.

There is only one method of locating crevasses that are covered by deep snow, and that is by "sounding" with the ice axe, but when the snow is wet and heavy the haft will often stick, even though the point has broken through into a crevasse. The best method is to strike with the axe haft, as one would chop when cutting wood. The instant a crevasse is discovered, the direction in which it runs should

be ascertained, and secondly its narrowest point.

Ice caverns were frequently encountered by the McKinley Expeditions, and when they are completely covered with a smooth snow mantle, they are death traps.

Men who have gotten their glacier knowledge among the Rockies must at once prepare themselves to forget what they know and begin at the beginning. The younger and less experienced members of a party are usually reckless, and adventurous, and when they first go on the ice will frequently object to the continuous use of the rope, and the slow pace necessitated by constant sounding. It is the leader's duty to firmly suppress this spirit, or trouble is sure to result.

Despite the fact that these remarks may be thought "out of place" among technical notes, I offer no apologies, for the reason that my own knowledge was bought at the expense of many years of hard and not infrequently, unpleasant experiences, and I should consider myself lacking in interest for the success of the Expedition were I to omit any detail that might be of benefit.

The best adhesive tape on the market is invaluable for mending broken ice axes, and an axe haft mended in this eay is perfectly reliable.

Snow shoes are a necessity on the northern glaciers throughout the early summer. The best type for ordinary travel are the long, slender, type, known as the "Susitna" shoe. Extra "babiche" should be taken so that the shoes can be mended when necessary, for carrying heavy packs through wet snow is hard on the shoes. Small bear-paw, or beaver-tail shoes of the white man make are better for rough

work on the mountain slopes. The McKinley Expeditions were equipped with both types. We also roughlocked our shoes for difficult climbing. The "Susitna" shoes should be purchased in Alaska.

PERSONNEL The success of the Logan Expedition, like every other body of men who have penetrated into wild lands, will depend primarily on the men composing the Expedition, and, almost to a like extent, on the relationship existing between them. This relation is largely in the leader's hands, and the groundwork on which he must build, is absolute, and unswerving justice to all. If A (See notes on Personal Kit) carries more personal belongings than B, he will carry less of the Expedition equipment than B, in a short time B. and his companions will be looking askance at A, and the esprit de corps will receive its first dent. To ensure success the leader must insist on the just partition of labor, hardship, comfort and food, and to insure such justice the rationing system is a necessity. Some men eat quickly, others slowly; some eat what they can get, others are temperate; and some men bear hunger with stoicism, while others who, maybe, have never experienced want in their lives, will succumb to the craving for food, and take what does not belong to them.

Those who lack experience usually think that going on rations means a cutting down of their food supply. It means nothing of the sort. A ration is a flexible measure. It can be increased, as well as decreased, as the state of the food supply permits, but its greatest recommendation is that it insures absolute justice to every man, as well as permitting the leader to plan his food supply with accuracy, and efficiency. A just distribution of the unpleasant jobs, or chores, such as cooking, or sleeping by the tent door, should be seen to by the

leader. If a man states that he cannot cook, the answer is that: ignorance is no excuse for "soldiering". Harshness, or candor on a leader's part will never be taken amiss by his companions if it is based on justice, and the welfare of the Expedition. Men grow very keen when living a life of hardship, and if they know that they can trust their leader, they will follow him.

On the Western slopes of Mt. Logan a party would be subjected to occasional "wet blizzards". These storms, frequently accompanied by heavy snow fall, will last for several days. Work or travel under such conditions is impossible, and a pack of cards or a pocket chess board will help a party to kill time. We also carried pocket editions of Shakespeare and other good authors, and found them invaluable.

MISCELLANEOUS In the Logan region snowshoes will be a necessity but with proper use and a supply of babiche, no extras need be carried. The flat, or piedmont type or glacier on the Western approach to Mt. Logan may be very treacherous, and heavily crevassed, due to their immense size, and the pressure from the tributary glaciers. For this reason, ski poles "stops" would be dangerous, and as the upper mountain slopes may consist of hard ice covered with a thick mantle of new snow, the same thing would be true. I have never seen conditions on Mt. McKinley where the use of stops would be advisable.

I have always smoked at high altitudes, (19,500 feet being the highest) and have found it beneficial.

These notes have been written at odd moments, during pressure of business, and there are many details of a technical nature, particularly in regard to glacial camping and travel that have not received full consideration.

Belmore Browne,

A P P E N D I X XII.

MOUNT EVEREST, A COMPARISON

Mt. Logan Lat. 60° 35' Everest Lat. 28° 00'

Long. 140 22 Long. 87 00 E

From the North Pole 2030 mi. From the Equator 1933 mi.

One, the same distance from the equator that theother is from the pole within 98 miles. Surrounding climatic conditions of necessity very different although on account of the much greater height above sea on Everest we find the following minimum temperatures recorded not widely different.

Mt. Logan Min. recorded (June 17 - 18) - 33° F

Mt. Everest Min. " (on first expedition) - 24° F

The Logan ice field being one of the largest of the world and the Everest comparatively small, we find the Canadian Expedition travelling 68 miles on the glaciers to reach the summit while the east Rumbuck galcier on Everest is only some miles long.

In general the Himalayan glaciers are four times as steep, rising four hundred feet to a mile against one hundred feet per mile in the case of the low valley glaciers of Alaska, the sam thing applying to the general steepness of the climb. The 6000 feet to make the summit of Everest from the North Col. from 23,000 feet had to be done in a traverse of three miles, while a traverse of eighteen miles and a climb of 12,000 feet were required on Logan, starting from an elevation of 7,800 feet.

The Logan massif is immeasurably larger, although relatively on a much lower plane. Logan at the 10,000 foot level cover about 100 square miles, while Everest taken at an elevation which would pass through the North Col. (23,000) would only cover some eight square miles.

Logan is essentially a snow and ice climb throughout, while Everest is primarily rock.

There is nothing to compare with the difficulties of Everest - It is immeasurably the greatest mountaineering task on the globe. - and if it had the temperatures recorded on Logan it would be* well nigh impossible for any living creature to withstand the effects of the rarified air.

* An expressiong of opinion made by a member of the first Mt. Everest Expedition.

APPENDIX XIII

MCKINLEY (MT. DENALI). A COMPARISON

Mt. McKinley (23,300 feet above the sea, the highest mountain on the continent) whose old Indian name is Denali, lies 400 miles to the northeast and is 450 feet higher than Logan and of course far below the vision of visibility.

The most noteworthy attempts to reach the summit of Mt. McKinley, which was first seen by Vancouver in 1794 are those of:-

Alfred Brook and D. L. Reaburn, Reconnaissance 1902

Dr. Frederick A Cooke expedition of May 1906. Discredited. (See "to the top of the continent" 1908)

Taylor and Anderson, the North Peak Apr. 10, 1910

Parker, Browne, LeVoy Expedition of 1912

Stuck - Karstens Expedition of 1913, Successful

The latter and only successful expedition to reach the summit did so from a camp at 18,000 feet on June 7th. On the summit they recorded the boiling point of water to be 174.9° F., an alcohol minimum thermometer stood at 7° F, and the reading of a mercurial barometer was 13.175".

A severe earthquake was recorded on July 6th, 1912, just two days after the Parker - Browne expedition had come down from the upper heights. The shattering effect of this earthquake was in unmistakable evidence the following year greatly increasing the dificulties of the Stuck expedition.

APPENDIX XIV.

ST. ELIAS, LOGAN, A COMPARISON

Although many attempts were made to reach the summit of St. Elias, the first being that of C.E.S. Wood in 1877, none reached anywhere near their goal, except I. C. Russell, who got as far as the Russell Col (12,300 feet) in 1891, and beyond to an elevation of 14,500 feet, while H.R.H. Duke of Abruzzi's expedition is the only one who, up to date, successfully reached its summit, after thirty-seven days' travel from the shores of the Pacific, on the 31st day of July, 1897.

Although the precipitation is very much greater on the coastal side of the range (Russell says sometimes a maximum of 150 of snow in a year) and much fog and moisture is invariably ever present, the summer minimums are fortunately less. Abruzzi's minimum is 14 above zero Fahrenheit (on the Russell Col 12,300 feet, August 1st) against the Logan minimum of 33 degrees below zero (June 17-18) at 16,800 feet.

1 Disinfectant Soap,

1 Ozonol.

APPENDIX XV.

MEDICINE CHEST

1 First Aid Booklet.

1 Friers Balsam,

1 Balsam Peru,

1 Iodine,

1 Alcohol,

1 Boracic Acid

1 Eye Lotion (Cocaine and Boracic in pds.)

1 Tube Borated Vasoline,

2 Vasoline,

1 Zinc Ointment,

1 - 8 oz. Jamaica Ginger,

2 Chlorodine, trit. & tinct.

1 Cascara, trit,

1 Aspirin,

1 pt. Castor Oil,

1 Caron-Oil,

1 Oil of Citrenella,

1 Minard's Liniment,

1 - 4 oz Absorbent,

1 Gauze,

1 Adhesive Plaster 2"

6 Bandages 2"

1 Bandage 1"

1 Lint 1 oz.

1 Instruments, Scalpel, Syringe, Tweezers, Scissors, needles, silk,

1 Lysol,