UNITED STATES

DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
_____National Park

ROCP5/5070-A21

Rocky Mountain National Park

1950 Glacier Report

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5670-PR

1950 Glacier Report

General. On August 28, 1950, the usual traditional measurements of the apparent fronts of Tyndall and Andrews Glaciers were made by Service personnel. The trip was made in conjunction with a naturalist field party, under the direction of Park Naturalist J. Herbert Heger, assisted by Ranger Naturalists Slater and Beidleman and museum assistant F. L. Sweet. The route was via Flattop Mountain, Tyndall Glacier and Andrews Glacier to the Loch and was made in one day. Heavy fall snows were encountered from 10:30 a.m., to 2:00 p.m., visibility was poor and temperatures were low. Messrs. Heger and Slater had made the 1949 observation and accordingly were familiar with the traditional routine.

Andrews Glacier. Measurements were made from points X' and X'" as customary. Distance from X' was 194 feet and from X'" 68 feet to the presumed nearest glacier ice. The glacier front showed considerable recession from point X' over the 1949 measurement, though the X'" measurement was fairly consistent with previous years' data. The usual problem of determining whether or not the "nearest glacier ice" is truly a part of the glacier or is merely a mass of stagnant contemporary snow and ice overlay was encountered. Comparative photographs submitted in the second section of this report, however, indicate that the glacier front is definitely smaller than in 1949. Although not previously noted, there appears to be some recession of the southwest side of Andrews Glacier, forming a sloping, crevasse-filled depression.

Tyndall Glacier. Here, again, the difficulty of determining the actual front of the glacier was encountered. Ice of unknown thickness may lie below the entire basal area and the data are consequently as erratic as in previous years. Inasmuch as rock points visible in 1949 photographs were covered by snow in 1950, it is evident that more ice and snow have accumulated at the front of the glacier during the present year. It should be noted that the point X of 1950 corresponds with point X of 1948; measurement from the 1949 point X' is also included. Orange letters (P) have been painted on rocks at photography points P-1, P-2 and P-3.

Conclusions. As has been repeatedly indicated in previous reports, the present traditional method of measuring the front of these glaciers is far from accurate or scientific, due to inadequate time, equipment and personnel. The 1950 photographs bear out, however, that Tyndall Glacier possesses a greater body of ice and snow at its snout than a year ago, whereas Andrews Glacier shows some recession.

Tables. Tables I to IV which follow give calculations of the previous measurements of these two glaciers, as well as pertinent meteorological data. The past winter of 1949-1950 was characterized by fairly light snows and more mild temperatures than during the previous year; the summer, however, was unusually cool with much inclement weather.

Illustrations. The last pages of this report give various views of the Andrews and Tyndall Glaciers taken from somewhat similar points this year compared to 1948.

R. G. Beidleman
Ranger-Naturalist

J. Herbert Heger
Park Naturalist

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TABLE I

Weather Statistics, August 1949 through July 1950

Month	Temperatures				Precipitation
	Average	Maximum	Minimum	No. of Days 32° or Less	Total
ESTES PARK					
August 1949	63.2	80	39	—	.94"
September 1949	53.5	79	25	10	.47
October 1949	42.3	72	11	24	1.41
November 1949	44.8	64	10	9	.08
December 1949	27.1	59	- 9	28	.20
January1950	26.0	55	-12	26	.49
February 1950	33.9	61	- 2	22	.11
March 1950	33.0	60	- 7	27	.28
April 1950	40.5	69	0	21	1.58
May 1950	44.8	72	22	23	2.19
June 1950	57.1	83	30	3	.59
July 1950	59.2	81	38	—	1.81
Average temperature 1949 - 50= 43.8			TOTAL	193 days	10.15"
GRAND LAKE					
August 1949	56.2	82	24	12	1.01"
September 1949	48.1	76	18	26	1.32
October 1949	36.9	69	3	31	1.32
November 1949	33.9	58	4	29	.20
December 1949	17.9	49	-15	31	1.50
January 1950	16.4	48	-22	31	2.00
Februaru 1950	20.0	56	-27	28	.67
March 1950	24.3	52	-10	31	.72
April 1950	34.2	64	- 9	30	2.00
May 1950	39.9	68	16	31	1.76
June 1950	49.5	78	19	24	.83
July 1950	52.6	78	24	14	1.94
Average temperature 1949 - 50= 35.8			TOTAL	318 days	15.27"

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TABLE II

Andrews Glacier

Year	X' to "Glacier Front"	X''' to "Glacier Front"
1932	48' 7"	
1933	58' 10"	
1934	139' 0"	
1935	66' 0"	(Station established
1936	No measurements	in 1938
1937	96' 10"	
1938	32' 3"	48' 11"
1939	92' 0"	23' 0"
1940	170' (est)	16' 9"
1941	212' 5"	54' 3"
1942	155' 8"	49' 1"
1943	No measurements	No measurements
1944	253' 0"	79' 2"
1945	210' 6"	65' 7"
1946	224' 9"	60' 8"
1947	201' 9"	66' 0"
1948	210' 0"	56' 0"
1949	164' 0"	64' 0"
1950	194' 0"	68' 0"

Remarks: Judgment of the field party as to "nearest glacier ice" varies, this doubtless explains the erratic figures.

5050-P06

TABLE III

Tyndall Glacier

Year	Station X' to "ice"
1932	30' 8"
1933	63' 4"
1934	72' 5"
1935	38' 6"
1936	No measurements
1937	196' 9"
1938	62' 4"
1939	105' 4"
1940	56' 0"
1941	No measurements
1942	At ice
1943	No measurements
1944	56' 3"
1945	54' 4"
1946	112' 11"
1947	5' to ice 180' to possible "glacier ice"
1948	260' to "foot of glacier" (adjusted from an erroneous measurement from Station X, not X')
1949	106'

Remarks: (1) Station X, used in 1948 was 300' from "nearest glacier ice". In 1949 a line from this station measured but 126'
(2) It is apparent from above table that measurements at Tyndall Glacier are highly erratic, with much variation in observor's judgment of actual glacier terminus.

	Station X	Station X'
1950	Same as 1948	
	94'	110'

TABLE IV

SNOW DEPTHS AND WATER CONTENT FOR PARK

Station	Dates	1950 Snow D.	1950 H_2O	1949 Snow D.	1949 H_2O	1948 Snow D.	1948 H_2O	Mean For No. of Years Snow D.	Mean For No. of Years H_2O		
Hidden Valley	Feb.1	34.7"	7.2	40.6"	11.0	33.5"	7.3	29.4"	6.5	10	years
	Mar.1	37.4	8.7	43.1"	12.5	50.1	10.3	36.7	8.6	10	"
	Apr.1	38.0	11.5	64.0	17.8	49.8	13.0	42.4	11.8	10	"
	May 1	44.9	12.5	44.9	15.6	41.3	12.7	43.6	12.9	10	"
Lake Irene	Feb.1	41.4"	10.7	57.1"	19.4	-- "	--	46.5"	12.4	12	"
	Mar.1	54.8	17.1	66.7	26.1	70.1	19.5	58.1	17.1	13	"
	Apr.1	61.4	20.9	83.1	28.9	75.1	23.8	64.6	21.0	13	"
	May 1	66.6	21.0	62.6	26.1	63.9	24.8	63.8	23.5	12	"
Wild Basin	Feb.1	33.8"	8.4	43.2"	14.4	-- "	--	30.4"	7.3	12	"
	Mar.1	39.0	11.0	45.5	15.5	46.2	11.1	38.7	9.9	13	"
	Apr.1	43.6	13.7	61.4	19.6	51.6	13.2	44.3	13.2	13	"
	May 1	39.0	14.5	42.2	15.9	36.1	12.2	38.3	13.5	13	"
Phantom Valley	Feb.1	28.4"	5.4	37.8"	10.3	32.6"	7.3	24.5"	5.4	14	"
	Mar.1	26.7	6.7	36.8	10.8	41.4	9.4	31.8	7.9	14	"
	Apr.1	31.2	9.9	45.4	13.1	39.7	10.7	33.1	9.4	14	"
	May 1	18.9	6.5	17.2	6.1	17.5	5.6	16.6	5.9	13	"
Grand Lake	Feb.1	25.9"	3.9	35.4"	8.7	--	--	30.7"	6.3	2	"
	Mar.1	25.8	5.2	36.2	9.9	--	--	30.0	7.5	2	"
	Apr.1	26.0	6.0	43.4	11.4	--	--	34.7	8.7	2	"
	May 1	--	--	12.5	4.4	--	--	12.5	4.4	1	"
North Inlet	Feb.1	18.7"	3.8	33.4"	9.2	--	--	23.2	5.2	12	"
	Mar.1	25.4	5.7	29.5	7.9	40.5	10.1	30.3	7.3	13	"
	Apr.1	27.5	7.6	42.1	12.6	39.4	11.4	32.0	9.2	13	"
	May 1	21.2	5.8	17.8	5.2	21.5	6.3	22.1	7.2	13	"
Copeland Lake	Feb.1	15.0"	3.8	20.9"	6.5	--	--	18.0"	5.2	2	"
	Mar.1	15.1	3.6	19.5	5.8	--	--	17.3	4.7	2	"
	Apr.1	9.2	3.2	23.8	7.3	--	--	16.5	5.3	2	"
	May 1	1.5	.7	1.9	.6	--	--	1.7	.7	2	"
Deer Ridge	Feb.1	17.4"	3.0	26.7"	7.5	--	--	22.1	5.3	2	"
	Mar.1	18.0	4.0	25.9	8.0	--	--	21.9	6.0	2	"
	Apr.1	15.8	4.2	32.4	8.7	--	--	24.1	6.5	2	"
	May 1	7.7	.9	6.0	2.3	--	--	6.9	1.6	2	"

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UNITED STATES

DEPARTMENT OF THE INTERIOR

NATIONAL PARK SERVICE

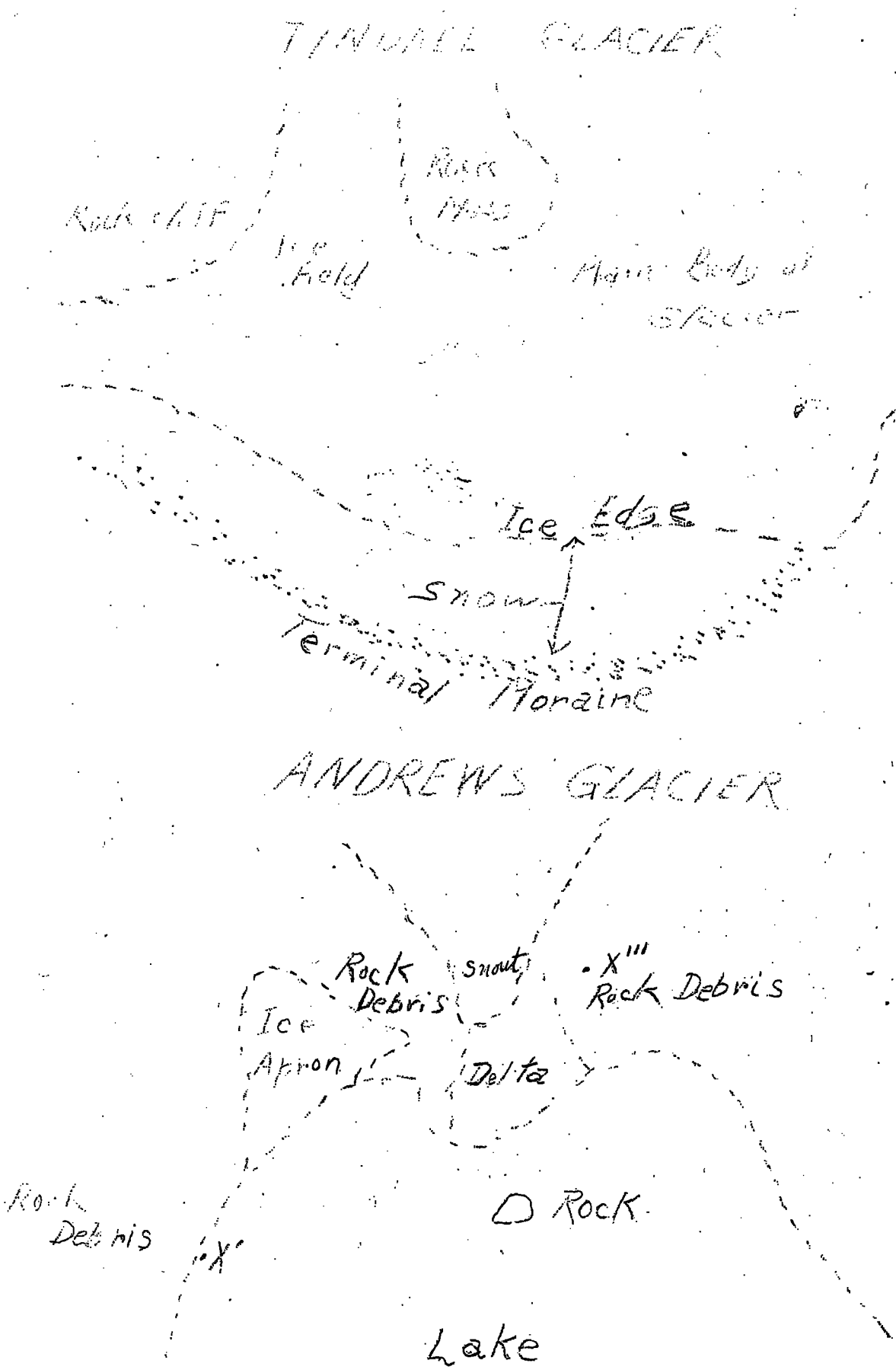
ROCKY MOUNTAIN NATIONAL PARK

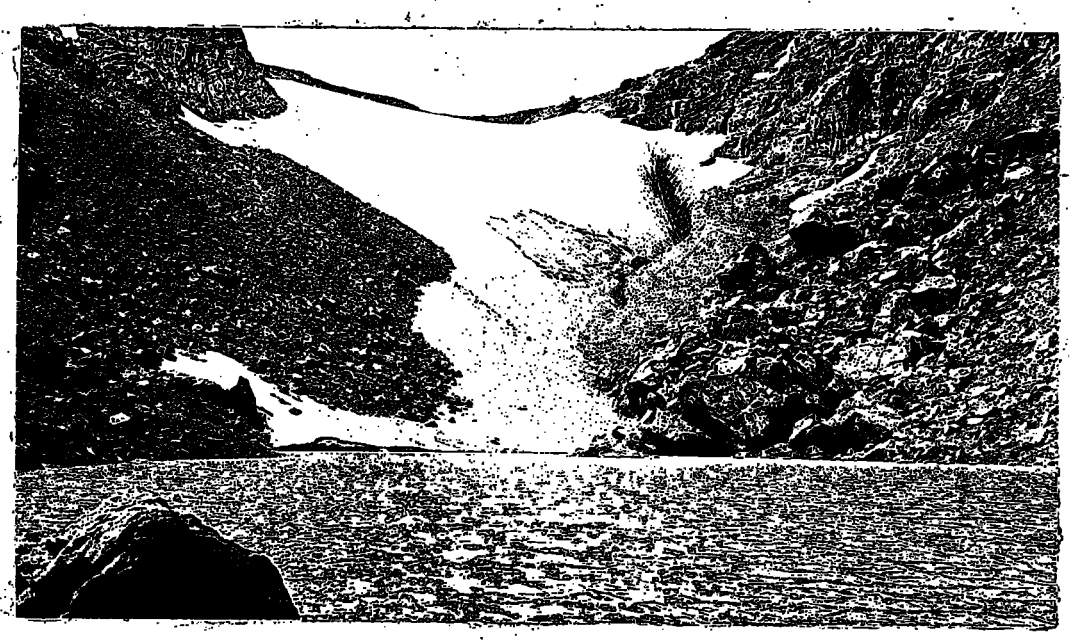
ESTES PARK, COLO.

SUPPLEMENT TO 1950

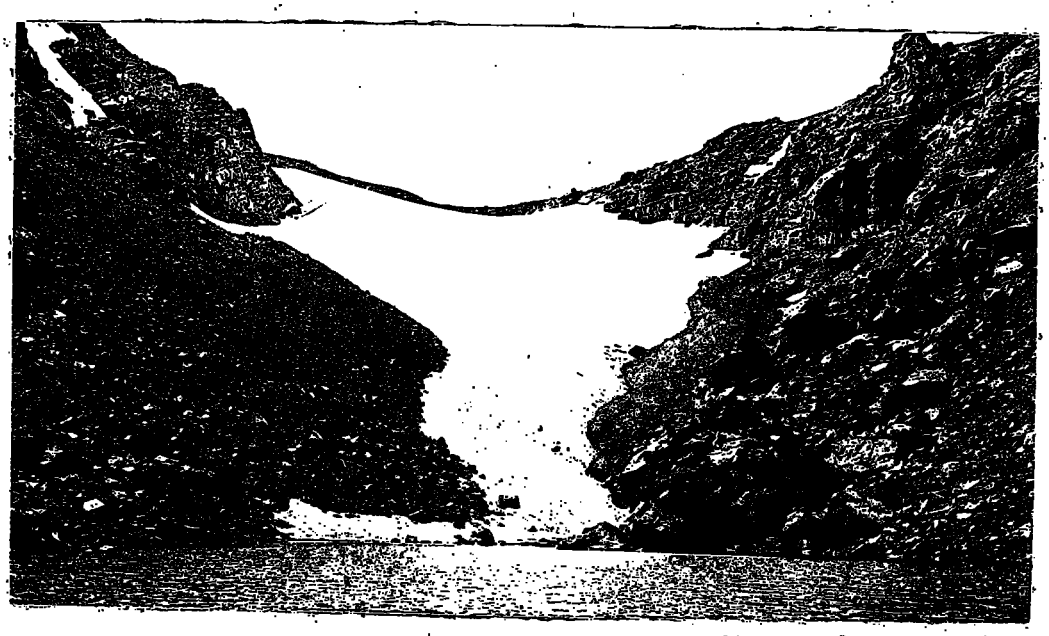
Glacier Measurement Report

ILLUSTRATIONS ONLY.


TANANA GLACIER
Rock Mass
Rock Cliff
Fold
Main Body of Glacier
Ice Edge
Snout
Terminal Moraine
ANDREWS GLACIER
Rock Debris
Snout
X'''
Rock Debris
Ice Apron
Delta
Rock Debris
X'
Rock
Lake



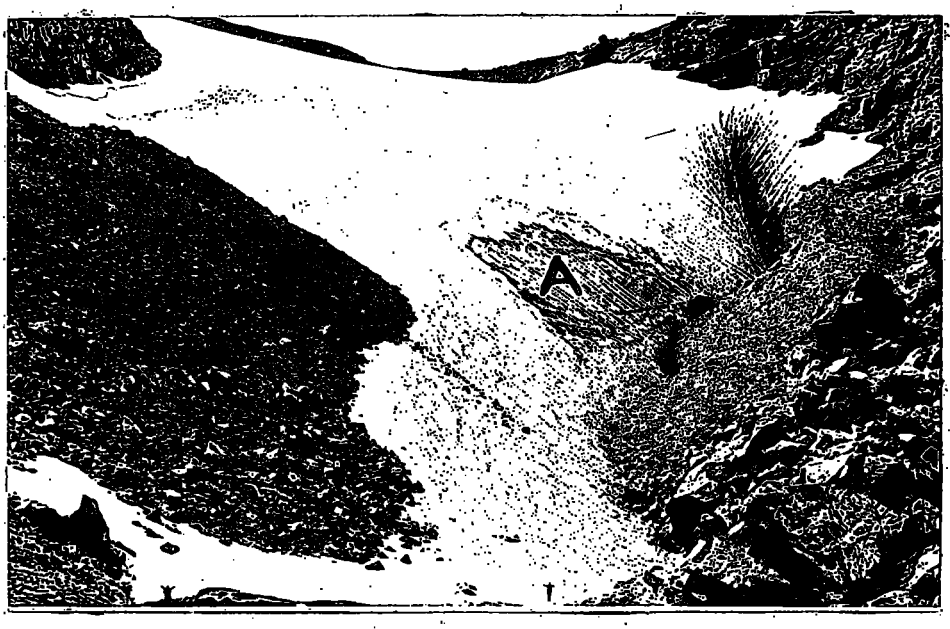
Andrews Glacier. General view, looking west across lake. September, 1949.



Andrews Glacier. General view, as in figure above. August 28, 1950.

Plate 1. Andrews Glacier.

57 JD-P10



Andrews Glacier, September, 1949, showing men on points X' and the presumed "nearest glacier ice," in snout. It is probable that the nearest (to point X') of true glacier ice is near section "A", in ink. If such is the case, these, and all previous, measurements are fallacious.

Andrews Glacier. Same view as above. August 28, 1950.

Plate 2. Andrews Glacier.

Andrews Glacier snout, September, 1949, taken from northeast across lake .

Andrews Glacier. Same view as above. August 28, 1950.

Plate 3. Andrews Glacier.

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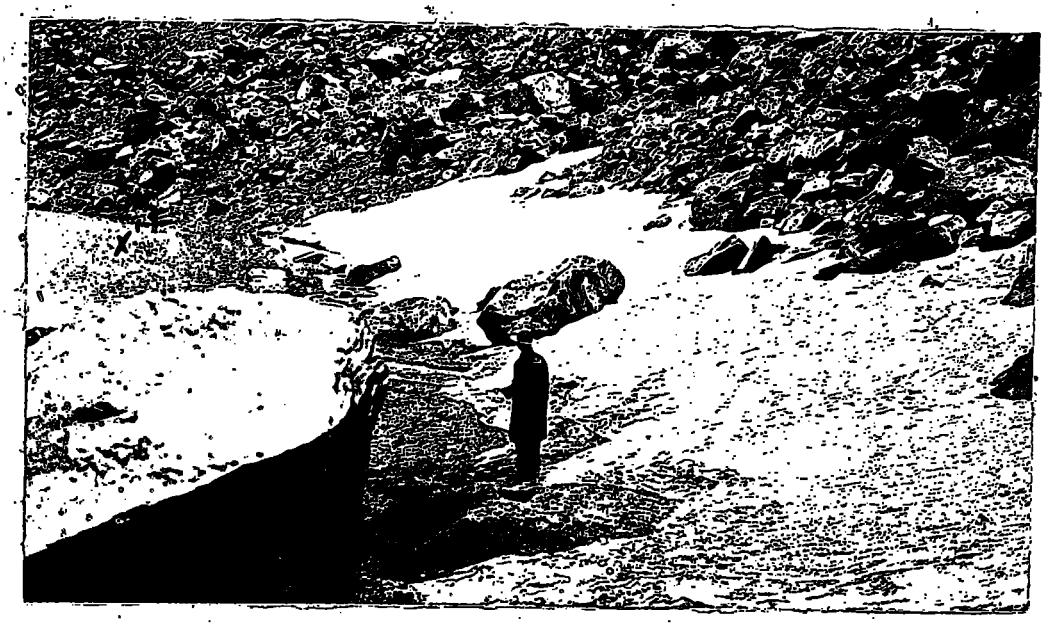
Andrews Glacier. Looking up glacier "snout" from delta. September, 1949.

Andrews Glacier, looking up glacier "snout" from northeast end of delta. August 28, 1950.

Plate 4. Andrews Glacier.

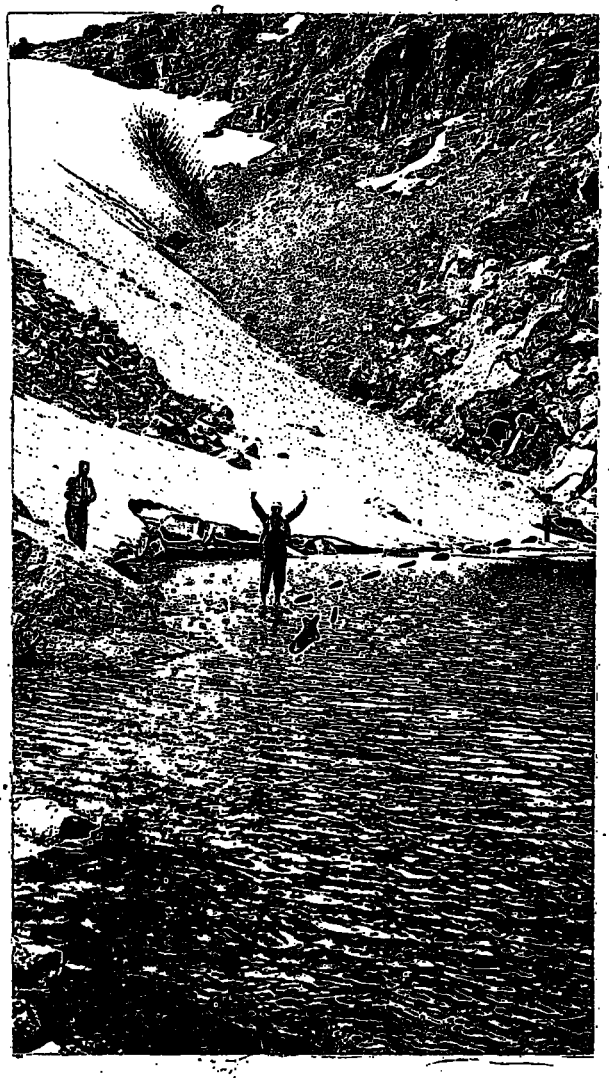
1950-P13

Andrews Glacier. View south, showing delta, lake shore and, in foreground, presumed snout of the glacier. September, 1949.

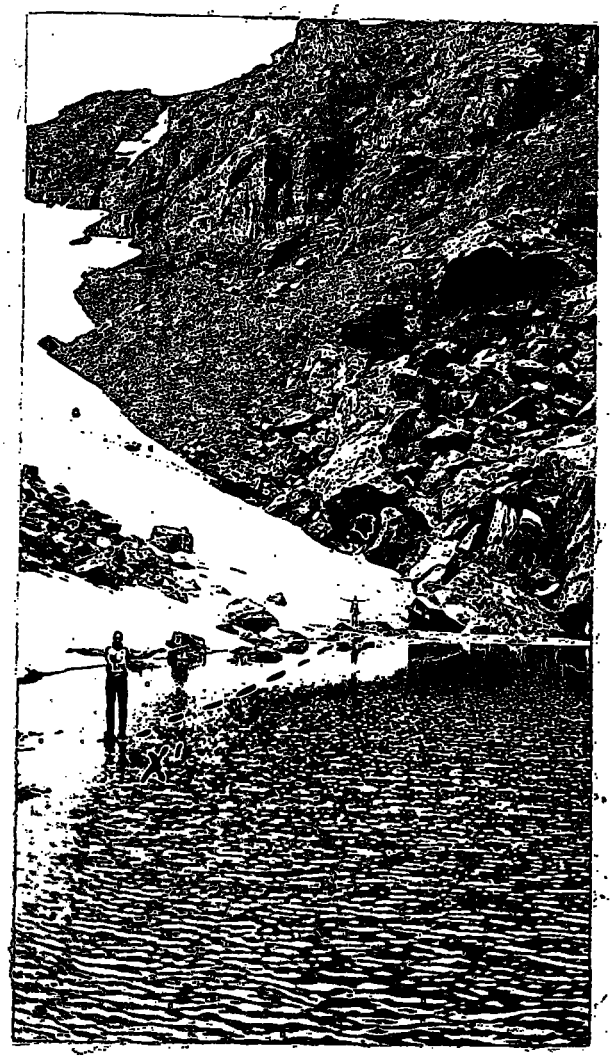


Andrews Glacier. Same view as above except from more westerly point. August 28, 1950.

Plate 5. Andrews Glacier.



(To left). Andrews Glacier, view along line of measurement from point X'. Man in foreground is standing on X'. Sept., 1949.



(to right). Andrews Glacier. Same view as above. August 28, 1950.

Plate 6. Andrews Glacier