TRU-LINE

Koch Conference

Feb 26, 1944 - March 3, from Comm.

Calorimetry Test of Jug

at Univ. of Nev. Feb 26.

Mch 10. Meadows mtg. Meadow Killing.

STENOGRAPHIC NOTES

No. 11

From February 11 — 1944

To March 14 — 1944

No. 26-G

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State ....

Drainage Basin South Yuba River

Snow Course Soda Springs

Party B. Eddy and A. Chase

Date Feb. 11, 1944

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	We[illegible]
	1	63	61		
	2	54	52		
	3	57	56		
	4	55	53		
	5	57	55		
	6	57	54		
	7	57	55		
	8	60	58		
	9	60	58		
	10	55	53		
		575			
Avg.		57.5			
		18.1 / 42 =		43.1%	

*Show number or description as given or No. 1," or "Major Course," or "N 5"

†Always start measurements for sampling shown by the sketch map of the cou[rse] for samples as indicated. Particular c[are] any *irregular* spacing between samples.

No.........of.........sheets. Comp. by.................Checked by.................

Builders Emporium
Lumber & Building Materials
1770 San Pablo -
El Cerrito ~~[illegible]~~ Calif.
Slat fence - rolls [illegible]

February 11-19.

Table prepared of Comparison of Precipitation Gages at Soda Springs for Winter 1942-43, Summer 1943, and Winter 1943-44.

a set of lantern slides prepared from my old photos and Gendel's new.

Snow Survey Error ?

February 11 by Blair Eddy for Fred Paget.

Depth 57.5 in. Water Equiv. 18.1 Dens. 31.5% T.P. gage[?] 46.9

Estimate February 10.

Depth 60 in. Water equiv. 16.08 Dens. 26.8% T.P. gage[?] 40.2

At Berkeley, Gendel pointed out the discrepancy between the snow survey Feb. 1 of 12.2 water equiv. and Feb 11 of 18.1 in. (gain 5.9 in.) with only a measured precipitation of 3.88 in. between them. The error of 2 in. seems large.

Better to erect the snow markers to keep the points of measurement as definite as possible.

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State
Drainage Basin South Yuba River
Snow Course Summit
Party B. Eddy and A. Chase
Date February 11, 1944

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	56	55			18		Dirt
	2	60	58			19		"
	3	64	62			21		"
	4	61	58			19		Rock
	5	62	59			20		"
	6	65	63			21		Ice
	7	64	62			20		"
	8	67	63			22		"
	9	65	64			21		Grass
	10	65	63			22		"
	11	64	63			21		Mud
	12	65	63			21		Grass
	13	63	60			20		"
Avg.	14	66	65			22		Ice
		887				287		
Avg.		63.4				20.5	32.3%	Dens.

205 = 42.9% of Apr. 1 Normal
47.8

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No. of sheets. Comp. by Checked by

Building Foundation

February 11-19.

Table prepared of Comparisons of Precipitation Gages at Soda Springs for Winter 1942-43, Summer 1943, and Winter 1943-44.

a set of lantern slides prepared from my old photos and Gendel's now.

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At Berkeley Gendel pointed out the discrepancy between the snow survey Feb 1 (gain 5.9 in.) of 12.2 water equiv. and Feb 11 of 18.1 in. (gain 5.9 in.) with only a measured precipitation of 3.88 in. between them. The error of 2 in. seems large.

Better to erect the snow markers & keep them points of measurement as definite as possible.

Study Individual Gages

Berkeley Meeting Feb 18.

Gendel also suggested that in place of average catch of the various gages attention be concentrated on the observed behavior of each individually.

Thus improvements can be devised for a superior gage, such as greater depth and capacity with less tendency to freeze and less cohesion of snow in the orifice.

He feels that the question of wind shield value has not been proved statistically. That Light's study leaves the question balanced.

Furthermore, the a more ideal situation and grouping of gages is essential, as in forest glades. That Nos 1 and 8 are affected by the presence of the thermometer shelters.

Finally in comparing normals of precip. and snow cover at Soda Springs, the readings of

Gages Nos. 9 and 10 should be used in place of the old standard No. 1. These catch considerably more because of their better and more isolated situation (also because nearer the ground where wind is less?)

The present normals are

Precip. No. 1 Nov.-Mch 35.98 in
Dec.-Mch 31.36

Snow cover Apr. 1 38.6 in.

→ Compute difference between No. 1 for 1943-44 and Nos. 9 and 10.

Ideally the difference betw precip. and snow cover should represent evaporation, but snow cover seems to exceed precip. Erosion in or away from can by wind? Will larger orifice help?

Army Engineer Gage (talk with Parsons)

Feb. 19 The seasonal catch is excellent and the capacity is abundant. But occasional depth measurements are

inaccurate because amount of chart is too flat due to conical shape of can.

The flapping collar does not flap and the cohesion of snow is too tenacious for snow to shave off. Gerdel has seen snow festoons clinging like birds to swaying wires.

Since air prevents evaporation completely Parsons suggests making the orifice as wide as the tank and painting the tank black to increase heating of contents. depth meas. would therefore be accurate whenever taken taken. A conversion factor for width in excess of 8 in. could readily be applied.

→ It is questionable whether the the inclined inner walls prevents adhesions of snow or ice. This is being tested by the R (Reducing Collar) Cage.

Corrected Copy, "Comparison of Precipitation Gages" in folder

Evaporation lacc

In the table evaporation occasionally gives way to accumulation but the amount +0.01 to +0.02 in is well within the limits of instrumental error.

The lack of evaporation is shown also in a series of measurements up Jamaille Canyon in the Ruby Mountains of eastern Nevada. The weighed merely the measurements never varied in the following cases

Aug. 8 → No. 3 [Cattle Gun 3.27]

Evaporation Lacs

In the tables evaporation occasionally gives way to accumulation but the amount $\pm 0.01_5 \pm 0.02^{in}$ is well within the limits of instrumental error.

The lacs of evaporation is shown also in a series of measurements up Lamoille Canyon in the Ruby Mountains of eastern Nevada. The weighed nearly the measurements never varied in the following cans

Lamoille Canyon
Weekly, Aug. 8 – Sep. 26, 1943
[Inches Water]

	No. 3 [Cattle Guard]	No. 5	No. 6	No. 7	No. 9
Aug. 8 →	3.27	3.70	—	4.15	4.45
Aug. 29	"	"	—	"	"
Sep. 5	"	"	4.55	"	"
Sep. 26	3.27	3.70	4.55	4.15	?

Analysis of Record of Stevens VI

Some mysteries: Why did pen go forward after reversing? The amount in the tank was too small to cause a forward movement until much more precipitation had occurred.

Why after the trip-weight was replaced did the pen move backward to record precipitation instead of forward? Then at left margin start [illegible]?

Merits: From July 27 to Oct. 1 no evaporation and no precipitation. Trace straight without deviation.

Begin

In October comparison with Gage No. 1 was as follows:

Oct 7.	No. 1	0.08 in;	No. 2 (SW)	0. in.
" 8	"	0.54;	"	0.32
" 17	"	0.40	"	0.40
" 18	"	T	"	0.08
" 19	"	0.16	"	0.16
" 20-21	"	1.15	"	1.20
" 27	"	0.19	"	0.20
" 29	"	0.05	"	0.05
" 30	"	0.06	"	0.10

Time Nov. 1 - 9hrs slow.

November 4 -	No. 1	T in.	; No. 2 (SW)	0 in.
" 16	"	0.06	"	0
" 19-21	"	1.29	"	1.65
" 30	"	0.59	"	0.60
December 5	"	0.03	"	0
" 6-31	Clock stopped, but restarted Dec. 31 before being rewound Jan. 1 4 P.M.			
" 19-29	No. 1	2.41	; No. 2 (SW)	2.80
" 19-Jan 1	"	2.79	"	2.96*

*No. 7 (SQ) 2.70 in.

January 1 - Trip weight jarred down.

" 2-17 No. 1 3.38 in.; No. 2 (SW) No record

" 17 No. 2 reset. But accumulated weight disturbed by resetting

" 22 No. 2 is reversing accurately.

" 23 No. 1 1.44 in.; No. 2 (SW) 1.52 in.

" 26-27 " 0.12 " 0.25

" 30-31 " 1.47 " 1.60

February 1-3	"	2.45	"	1.68
" 1-4	"	2.51	"	3.48
" 8-9	"	1.37	"	0.82

at left margin 1/10 → 1/10

On February 10 the ruled sheet was replaced by a ruled sheet of same scale (0.10 in = 2 hrs and 0.20 in = 1 day) and the stylus by a siphon pen attached to a glass barrel of ink.

→ Position of pen was not noted but was approx. 0.8 in from old base line on left side of sheet. The pen may then have started toward the right again — an extension of the mystery of its earlier reversing and partial recovery.

Tracker Sno-Cat

Feb. 19. At Snow Conference Dean Clyde showed slides of the Utah Snowmobile that "always returns".

Long brought 800 ft of film of the Edison machine with improvements.

But on returning to Reno that evening found message from the Tracker who had been at Soda Springs and had come to Reno to show

the sled at Grass Lake.

Feb. 20 (Sunday) Our family rode from Galena Creek to astronomy grounds above Grass Lake. Demonstration so good that I sent following night letter to Work:

Night letter. Reno, Feb 20, 1944

R. A. Work,
Care W. W. McLaughlin, Irrigation
Post office Bldg Berkeley

Two men demonstrating skis sled at Mount Rose today and tomorrow. Willing to stop at Soda Springs Tuesday. Can you be there Tuesday ~~or Wednesday~~? Wire me University 5101 N.N.E.S. J. E. Church

Meantime, arranged with Telephone and Power companies for another trip on Feb. 21 (Monday).

The results are contained in a letter to the Quartermaster's Office as Advisor.

Only one detail omitted. The motor should be provided with a forced-feed oil system instead of a splash for

security against burning bearings on very steep slopes.

Letter to Q.M.G.

a wire from Work announced his inability to come to Soda Springs. A storm was on, so I remained at Cisco with a cold and Tucker returned to his home at Grass Valley.

Office Work

February 22. Gendel came up to Soda Springs today (Tuesday) as promised. When I offered to come Thursday, he offered to continue the observations for me, especially since he had a full house of company over the week-end. I floored that I could hug him for that, for my desk was

piled high.

Precipitation Measurements

On Feb 22 Gendel took the weights of all the cans and again on March 1 at the time of the Snow Survey. These will be presented together.

Calorimetry - Test of Jug.

Sat. Feb 26 (Rand at Engr. Station)

The thermos jug insulated with rock wool was tested for slowness of cooling to determine its steadiness in maintaining temperatures sufficiently long to be accurately read.

A Centigrade therm. graduated to 1/10° degree in paraffined cork was used.

The maximum heat was determined by the capacity of 50°C = 122°F.

(a) The temp. of the water after the jar was warmed and while the jar was being continuously rocked fell from 48.8°C to 48°C in 7 minutes.

(b) After snow was inserted and water was thoroly stirred by rocking,

in 5 minutes the min. rose from 24.5°C to 24.8°C.

For next 5 minutes the temp. remained steady at 24.8°C.

Test ended at 4:50 pm.

A giant vacuum jug should be tested in the same way. It is probably more stable. Two such jugs have been ordered.

The first jugs are probably too small.

→ A careful check on the maximum temperature of the water must also be kept to avoid breaking the 50°C thermometer which seems to be standard for graduations to 1/10°.

→ Kendel points out that these water thermometers are adjusted for the bulbs any depth in or out of water. The Physics Dept makes the same assurance.

[Over]

Gendel believes that 50°C is too low a temperature for a ~~hot~~ test of the jug and would seek ambient air temperature diverse from that of the water.

Furthermore hotter water must be used to melt snow successfully and he prefers to use a thermometer graduated to tenths of a degree rather than estimate tenths visually by use of magnifying glass. This would mean for 100°C max. the use of a thermometer of double or 24 inch length.

Since this could not safely be left known in the field, he would get specimens frozen in vacuum thermos bottles which would be measured for weight and temperature before and after at the office. He believes that the temperatures will remain constant for hours. Furthermore that snow temperature taken at depth in the snow is fairly constant for several days.

The observers will get the data but the central office will compute them

Feb. 29 Conference with Army Engineers

a letter from Albert A. Koch, old friend of the Regional Office of the Army Engineers at San Francisco, requested a conference Feb. 28.

I wrote Gendel and him suggesting a joint conference at Soda Springs but he called up by phone to express preferance for a conference with me only at Reno. I wrote Gendel explaining.

He and Jeanne arrived in February 29 quite belated by storm and hungry at noon. They returned home that evening.

The plans are fully covered in correspondence with Director Paton and Merrill Bernard. An opportunity to make this Snow Standards Station at Soda Springs the mother of a series of stations in the Columbia Basin. All agencies should share in so large a project.

C O P Y

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State _____

Drainage Basin South Yuba River

Snow Course Soda Springs

Party B. Eddy & A. Chase

Date 3/1/44

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
Key	1	107	102			29		Ice on bottom
	2	98	94			26		" " "
Course	3	100	96			26		Gravel
	4	97	91			25		Dirt
	5	102	96			27		Grass
	6	99	95			26		Grass
	7	101	96			28		Grass
	8	107	102			30		Grass
	9	100	96			27		Grass
	10	106	101			29		Grass
		1017				273		
Avg.		101.7				27.3	26.8%	Dens.

27.3 / 41.5 = 65% of April 1 Normal

C O P Y

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State _____

Drainage Basin South Yuba River

Snow Course Summit

Party B. Eddy and A. Chase

Date 3/1/44

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	100	96			27		Dirt
Key	2	101	96			26		"
	3	106	102			28		"
Course	4	104	100			27		Ice on bottom
	5	105	101			27		" " "
	6	107	102			28		" " "
	7	110	105			29		Grass
	8	109	104			28		Grass
	9	106	103			28		Grass
	10	107	103			28		"
	11	106	103			27		"
	12	103	100			27		Ice on bottom
	13	100	95			26		Ice on bottom
	14	106	103			28		" " "
		1470				384		
Avg.		105.0				27.4	26.1%	Dens

27.4 / 47.8 = 57.3% of Apr. 1 Normal

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No. ____ of ____ sheets. Comp. by ____ Checked by ____

1944"

When I arrived Friday March 3 at close of storm and apparently at the beginning of another, Gendel had returned on Thursday afternoon to Sacramento for a few days.

Gerdel came up to Soda Springs today for the March measurements but Arthur Comilland phoned that he had not seen him. So I lingered to prepare a bulletin on snow and water conditions as follows:

"Snow cover and prospects for Nevada, March, 1944" to folder

When I arrived Friday March 3 at close of storm and apparently at the beginning of another, Gerdel had returned on Thursday afternoon to Sacramento for a few days.

Weather Record for February

Date	Max	Min	Prec.	Snowfall	Ground	Wind	Obs.
Feb 1	37	29	0.35 DN	3	47	NE	Stormy
			#1 687				
			2 337				
2	35	30	1.15	7	53	NW	Stormy
			#1 728				
			2 386				
3	34	28	1.30	9	62	NW	Stormy
			#1 787				
			2 465				
4	47	1	0.06 DN	T	61	N	clr
			#1 810				
			2 510				
Pasture			Max 43	Read 41			
			Min −1	" 40			
5	57	−20			60	SE	clr
			#1 852				
			2 558				

Feb 6	52	13			58	SE	clr
			#1 917				
			2 619				
7	51	12			57	NW	Pt cldy
			#1 15				
			2 723				
8	42	22	1.24 3 am	15	60	NW	Stmy
			#1 110				
			2 819				
9	33	21	0.13 DN	T	60	NW	cldy
			#1 201				
			2 900				
10	33	11			59	E	clr
			#1 460				
			2 197				
11	48	-3			57	SE	clr
			#1 540				
			2 250				

Pasture Max. 51 Rest 44
Min -6 " 43

Feb 12 48 12 53 E clr
#1 816
2 548

13 46 11 52 E clr
#1 28
2 771

14 38 21 0.04 T 52 NW Pt cldy
9am-2:30pm
#1 135
2 899

15 29 12 52 E clr
#1 377
2 212

16 36 -4 52 NW Pt cldy
#1 494
2 338

17 81 19 0.10 1 52 E clr
8pm-11pm
#1 642
2 498

Feb 18 35 -10 51 NW Pt cldy
#1 733
2 584

Pasture
Max 42 Rest 30
Min -9 " 29

19 35 12 T DN 50 E clr
#1 829
2 681

20 35 13 50 E clr
#1 960
2 828

21 35 21 0.72 10 58 SE Stmy
5pm
#1 53
2 922

22 36 20 0.90 10 66 SE Pt cldy
DN
#1 121
2 993

23 39 19 0.13 2 67 N Pt cldy
DN
#1 160
2 28

Feb 24 43 −3 0.09 1 65 NW Cl
6pm-DN
#1 236
2 105

25 40 0 0.02 T 64 NW Cl
DN
#1 315
2 205

Pasture
Max. 43 Rest 37
Min −7 " 36

26 38 12 0.19 3 65 E Cl
9pm-DN
#1 454
2 251

27 36 −2 61 E Pt Cldy
#1 595
2 398

28 30 21 0.82 26 80 W Stny
1 am.
#1 729
2 541

29 29 22 0.94 20 88 N Stny
#1 850
2 669

Precip — wt. by Dr Gerdel.

Gage No		Feb 22	Mar 1 2:00–4:00 PM
4		10.06	12.89
6		9.75	12.28
8		9.30	11.57
9		8.84	12.80
10		9.00	13.08
USED (3)	stick	20.8	22.0
P		12.92	15.24
PC		11.43	13.83
R	stick	7.8	9.8 (f=.525)
Q		3.9" above base line	6.45" above base line
W		0.8" from base line	2.90" from base line

Snow Survey Mar. 1, 12:00 noon

Soda Springs	101.7" depth	27.3" water equiv.
Donner Summit	105.0" depth	27.4" " "

Weather Record March

Date	Max	Min	Prec.	Snfall	S. on Gd.	Wind	Clds
Mch 1	39	22	0.91	11	97	E	Hzlly
			#1 911				
			2 830		Precip. Feb. 8.59 in.		
2	41	5	0.02	T	90	NW	clr
			#1 990				
			2 ~~868~~ 905				
3	40	11	0.21	4	90	N	stmy
			#1 84				
			2 48				
Pasture							
	Max 39		Rest 27.8				
	Min -2.1		" 27.5				
4	28	20	1.42	24	106	NW	stmy
			#1 288				
			2 275				
5	34	18	0.24	3	106	N	clr
			#1 403				
			2 390				

6	42	22		103	E	Pt cldy
			#1 480			
			2 461			
7	53	19		96	SE	Pt cldy
			#1 513			
			2 503			
8	48	12		91	E	cl
			#1 603			
			2 594			
9	60	28		84	E	Pt cldy
			#1 695			
			2 691			
10	58	22	0.02 5:30pm	82	E	cl
			#1 730			
			2 727			

Pasture

Max 56 Reset 56

Min 11 " 56

[Over]

March 11 56 19   80 E Pt cldy
#1 805
2 812

" 12 50 31 0.45 T 80 N Stny
6pm
#1 875
2 899

Last night at 6 a thunder snow-rain storm. Tag wet without wraps. Arthur Camillard brought us home.

This morning snowing. Snow and slush approx: 1/2 in.

" 13 33 14 0.34 3 82 NW Pt cldy
8pm-12 Noon
Snowing day E 20 mi.

#1 69 (4pm) Total 24 hrs 184 mi Hotel.
2 107 (5pm) " " 198 Pasture
= 8 mi. per hr. average

Stevens 5 0.25 in. But 3 large drops on cap of outlet.
Did No 1. 0.34 in catch drift snow from thermometer shelter?

March 14 21 8   80 E clr
#1 365 Total 296 mi.
2 426 " 319 "

15 39 14   77 E clr
#1 705 Total 340 mi.
2 830 " 404 "

16 46 29   74 E Pt cldy
#1 80 Total 365 mi.
2 250 " 410 "

17 55 36   72 E clr
#1 270 Total 190 mi.
2 478 " 228 "

Pasture
Max. 52 Reset 50
Min. 6 " 50

18 52 33   70 E clr
#1 446 Total 176 mi.
2 683 " 205 "
Snow survey 1-10 meas. 73 in

March 19 56 22 69 NW clr
#1 519
2 723

" 20 40 12 68 E clr
#1 700
2 924

" 21 37 22 66 E clr
#1 900
2 254

" 22 55 25 65 E clr
#1 55
2 410

" 23 50 18 64 E Pt Cldy
#1 120
2 480

" 24 47 27 62 NW clr
#1 210
2 634
Max. 55°F Rest 43°
Min. 13°F " 43°

" 25 45 24 R.T* 60** NW clr
* Min. therm. defective
** Sunset cloudy 64° in
#1 315
2 759 [See back of page]

Mar. 26	45	8	# 387 843	60	NW	Clr
" 27	41	11	# 528 10	59	NW	Clr
" 28	43	16	# 800 291	58	E	Clr
" 29	48	28	# 980 498	58	SE	Clr
" 30	54	12	# 64 585	56	W	Clr
" 31	56	20	* 148 664	54	NW	Clr

In Pasture
Max. 52.6°F Past 48.0°F
Min. 6.0° " 47.2°

Trip to Soda Springs

March 3. Storm promised. Overcast.

Snow allway from Reno along the roadside.

Snowflakes at ~~recoil~~ station.

Flakes blowing and swirling on pavement.

Colonel Truck on side on the rocks held from rolling over down the rocks by the trailer whose hind wheels were still on the bank.

Blizzard

Message from Gerdel. Had gone down last night. Merrill Barnard wants details regarding Rocha visit and omission of Gerdel. Long phone talk with Linsay at Sacramento.

Called Dacey urging her to come up by bus.

Observing Cows in Storm

Dry flakes at 28°F, but ice on walls of cows

Snow banked on leeward, i.e.

an sheltered wall 7 cans.
Snow melting slowly. Big cans more liquified. Nos 9 and 10 in snow.

Saturday March 4.

When were cans rechanged last?
Nos 4, 6, 8 rechanged Feb 4;
Nos 9 and 10 and 7 (Stevens Q) rechanged Feb. 10.

Snow Heights in Cans

Snow Stakes Mch 3 90 in.
" " " 4 109 in. accumm. 19 in.

No. 1 - Depth 24 in. = 1.42 in. WEquiv.

Nos 2 and 3. Mat ice.
In 3 some adhesions.

No. 4. Snow 2 in. below rim.

Plastic - Near 1½ in. below rim.
No adhesions

Redwood can. Capacity ?

Antifreeze - Snow 1-2 in. below.

No. 5 Tinz. Can full, snow in neck.

In Pasture -

No. 6. ~~Snow to top.~~

No. 7 Stevens Q

Tall chimney gives additional room.

No. 8 Can shake down.

No. 9 1 ft ~~to spare~~.

No. 10 1 ft ~~to spare~~.

Snow built up in lee side of can or eroded on windward (?)

→ Snow Fence.

Got 150 ft. of slat fence.

Density

Get density of new snow.

Blockade.

Plane over this morning and this evening.

Tonight only one trace clear.

Plows busy again on highway.

Becky takes 7:45 pm train.

Barometer still rising tho slowly.

[Over]

Trains due in early morning
came in late in afternoon.
Snow drifted to glass on door.
Sank to armpits. Paths obliterated.
Passengers wallowed like the
Klondyke trek. No mittens, low shoes,
short socks. Soaked and frozen.
Could stand on snowbank and
look over top of passenger trains.
Could walk up station roof.
Up till midnight waiting for the trains

March 5. Sunday

Bacry could not purchase tickets.
Over 200 already standing, but Marshall
came in at 3 a.m. Slept on floor
at Parson Hill lodge rather than
disturb me.

Precip. 0.24 in. Snow 3 in. Snow Cover 106

Ski trails warm again. Highway
finally cleared. Lined with autos.

Studying Gages all day. 12 pictures.
Gages ready for another storm but
can't absorb snow too rapidly.

Marshall missed the trains and
will remain until tomorrow night.

Trees

Clear once more. Snow on
trees from last night but none
yesterday. Gale yesterday. Snow dry,
no sticking.

But snow stuck on warm shovel
this morning. Sticks slightly to ski
and wabs.

Studying crusts at 12 noon.

Inspecting Cans under Sun

Pastire

No.6 ½ in. snow and then slush
Core 1 in. retracted from sun-warmed
wall of can. 10 in. below rim.

under
Sun

[illegible] floating ice and slush
[illegible] Snow scant as usual.
[illegible] melting on gray iron
an[illegible] wood.

No.8 11½ in. ~~to~~ snow remnant and
slush. No ice.

Temp.
→ H-T temp. 25.8°F in shade.
Humidity high - Temp. 25 but hygrometer
hairs and metal therm. bulb in snow.
Snow on H-T case. Dry in shade.
Drift snow (fine) on thermometers
and H-T. When snow removed,
humidity dropped from 100 to 75%.
But temperature unchanged.

#

Studying crusts at 12 noon.

Inspecting Cans under Sun

Pasture

No. 6 ½ in. snow and then slush
Can 1 in. retracted from sun-warmed
wall of can. 10 in. below rim.

No. 7 Stevens Q
3¼ in. of floating ice and slush
in bucket. Snow scant as usual.
on trestle and melting on gray iron
and white wood.

No. 8 1½ in. of snow remnant and
slush. No ice.

Temp. → H-T temp. 25.8° F in shade.
Humidity high. Temp. 25 but hygrometer
hair and metal thermo. bulb in snow.
Snow on H-T case. Dry in shade.
Drift snow (fine) on thermometers
and H-T. When snow removed,
humidity dropped from 100 to 75%.
But temperature unchanged.

No. 9 - Snow 21 in. below. Less slushy than in Nos. 6 and 8. Reason: buried 19 in. in snow. But soft throughout.

Snow Stake 9 ft (108 in.)

No. 10. Snow dry. 15½ in. below rim on SE side and 19½ in. on NW. Wind, here, from SE yesterday. Sun has no effect.

Can buried below 11-14 in. drift back of can NE not SE.

Hotel

No. 2 Stevens W.
Wet slush.

No. 3 Army Engr.
Slush that can be criss-crossed thru and thru with stick.
Snow all slush.

No. 4. An ice-slush pan, but immediately can be stirred to cold porridge.

Reducer -

30 in. to snow-ice hummock loose and melted an inch or more toward S. Ice fairly hard

Crestone

Dry snow on dock 7 in. down. Solid ice core 9 in. down, floating in can and merely loose from the walls.

1 Gallon originally. How great is the present dilution?

Plastics

At 11 a.m. snow as in photo 1-1½ in. below rim

At 1:30 pm snow shrunk 1⅝ in. on can side of can but to 14 in. to water in rear. Second photo.

Effect of sun shining into can

Ice core at 14 in. but melted loose from sides.

Melting

Film of snow on iron and wood melted but no melting elsewhere. Quite dry.

H-T - Thermometers and H-T in drift snow but humidity hairs in free snow-tunnel, so 55%. In storm 95%.

Temp. 30°F H-T. 32°F.

Cleared of snow.

No. 5. Frig.

Snow 9-10 in. below rim, 13½ in. to water.

Bucket nearly full.

Snow shrunk opposite sun; Sheltered by wall from sun. Insolation?

→ Last metering stick at SW corner of inside of tower at 60 in. level of snow.

9.25 in. at 2:10 pm March 5.

Pastures.

4 pm. Anem. dial 389.82 mi.

Snow Stake - 106 in. Snow settling also on windows of Quarters,

No. 7. Stevens Q.

Feb. 28	8.4 in.	(5 am.)
" 29	12.4 in.	(4 p.m.)
Mch 1	12.92	(2 p.m.)
" 5	16.65	(4:20 p.m.)

Snow 3:30 p.m. Snow fell loose 0.3 in.
Clock running.
Rec ½ full!

Highway

Highway packed, chain-marked.

Snow corridor cut into garage. 8 workers shoveling and 4 pulling to bring an auto out.

Cables and Wires

Cable of triple-register 6 ft. above snow. Wires from cable and to Quarters only chin high. Unsafe on drifts here.

<u>Snow Textures</u>

5 pm. By Filling Station facing sun.

The Fuchsine is green if untouched on snow. If snow is pinched, the Fuchsine becomes red.

If pressed by table knife, the blade also becomes red.

Crystals 1 mm in size except as clings together.

Crust forming where moist, otherwise snow remains soft.

At sunset visited the Fuchsine dye. The inert green had turned red below and sunk 1/4 in. into snow. But some portions, especially around edge of hole were still red.

The other portion that had turned red under pinching and pressure also had sunk but the edge was gradual  , while the hole edged by green had a sharp lip  , caused by insolation on the opaque pile of dye?

Stevens Snow Gage

Marshall helped open the box that arrived from Valpel-Stevens in early December.

It was a self-contained snow can with sliding yoke from which to hang spring balance for weighing can.

Will be good test for weighing cans instead of using stick. Better in cold weather.

However, the supporting rest is too high on the can and affords a shelf for new snow to build up upon.

Monday, March 6-

By telethermoscope 8 am 14°F.
9:30 am 24°F.

Frost

Frost falling in flakes from trees at 8 a.m. The mines are now showing dark at intervals.

→ Phenomenon like falling of snow from trees but quicker because of smaller amount. [Over] ←

Snow Textures - Dyes

Morning March 6.

Fuchsine in shade.

Dye green again where initially dormant.

Dye in frozen snow is purple.

Crust 1/4 in. with frost deposit on top.
Snow must have been moist yesterday
tho difficult to detect.

3 pm.

Snow very moist. Sliding from roof.
Each spots of dye now brilliant red.
Water very potent on it.

2:30 pm. Temp. by telethem. 48°F.

4 pm

Snow stake 103 in.

Oil and Melting

Heavy oil and semi-solid ice in
all cans, floating in water.

→ Will flakes melt faster in light oil?
Snow wet and soft.

Try out oil No. 10 and mineral oil
next summer.

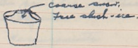
Several cans of No. 10 upstairs. Perhaps
for sale.

Precipitation Cans

No. 5 - Frig.

Rescued measuring stick from
bottom of Frig tower by removing
boards.

Snow in No. 5



No. 2. Stevens W. !!

3 pm. Going forward. (Gundel says that
it went backward at first)

Scale: 1 day = 12 squares of 0.10 in.
or 2 hrs for each square.
1 in (10 squares) = 2 in precip. or
0.10 in. square = 0.20 in precip.

The width of the sheet = 20 in (?)
precip. but pen reverses
once while weight traverses
the bar once. Thus one
traverse of weight = 40 in.
precip., and the second
traverse made possible
by the trip weight = 80 in.
or double normal.

Susan Textures - Dues

⇒ Here is explanation of the "mystery" noted elsewhere - a reverse within a reverse.

The midnight lines are marked but the pen has not been set to correspond.

Measurements

Three days ago storm recorded at 2.9 in. to 4.5 in. end of day and heavy storm.

Second Day - from 4.5 in. to 4.7 in.

Last Day (yesterday) 4.7 to 4.72 in.

Today line is straight.

Total for 3 days 1.82 in. = 3.64 in. precip.

Time allignment is off. Now at 3pm., 0.10 in. beyond heavy line (midnight).

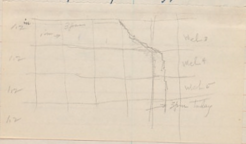
Rewound.

Snow textures - ...

Increments of height

Rain seems to record by increments of 0.05 in. on scale or 24 to 1 in. (= 2 in. precipitation actual).

The following is suggestive:



Cans Textures Tests

Reweighing Cans

Sky overcast. Damp? But humidity per Law and barometer high. Temp. 40°F. Decided to take no chances but reweigh cans. Hotel. 4:30 pm.

Asked Marshall to stay and help me weigh the cans. He was planning to catch the 5:10 pm train home.

I lifted the Plastic Can but realized that my back was reaching its limit of strength.

Hotel.

Plastic
Wt 3.92 (14.92) Dpth 13.9 in.

No. 3 Army Engr. Stick 22.89 in. or 22.9 in.
Stuck above. Broke thru.

No. 4 Wt 5.05 (16.05) Dpth 14.6 in.

Reducer* Wt 10.57 (21.57) Dpth 10.1 in.
*Found leaking by R.W.C. on Mch 8.

Prestone Wt 4.97 (15.97) Dpth 15.7

Data for March [illegible] in folder

Pasture –

No. 6 Wt 13.70^{in} (2.70) Dpth 12.7$^{in.}$

No. 8 Wt 1.88^{in} Dpth 10.5$^{in.}$

No. 9 Wt 4.35^{+in} (15.35^{+}) Dpth 13.3$^{in.}$

No. 10 Wt 4.78$^{in.}$ Dpth* 13.55^{in}

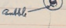
* But including snow 14.5$^{in.}$
Snow ~~not but~~ floats above oil.
Snow inside dry.

Crusts

Temp. 6 pm. 36°F. Crust has been forming for an hour since 38°F.
7 pm crust firm. Telethermo 28.4°F.

No. 7 – Stevens Q.

Feb. 28 – 8.4^{in}
" 29 – 4 pm 12^{in}
Mch 1 2 pm 12.92^{in}
" 3 noon 13^{in}
" 5 4 pm 16.65^{in}
" 6 6 pm 16.65 but —— . Effect of temp.



→ Rewound.
Guy wires under pressure of snow. Tower tilted

Bubble

Picture

* Snow on gently slanting shed-roof of Hotel was projecting like a thin plastic sheet far out - half the width of the roof itself - without support and with only a gradual curve. Cohesion and rigidity very pronounced. Likewise the deep on the opaque sun-warmed roof until the roof was half bare. Creep may have been started or accelerated by snow from the steeper roof above.

See section view.
No film left for the creep.

Tuesday March 7 -

Mottled clouds. 9 a.m. 27°F

Snow Textures

Fuchsine has all become purple.
Crust 1/4 in. deep.

The fuchsine pile has melted a bowl ⌣ 1 in. deep.

Dye has gone 1 in. lower with last night's crust as yesterday's melting.

Tiny patch of fuchsine on pinhead snow has gone down a melt vein in powder snow about 2 to 3 in.

No. 5 - Trig. Recharged. Mar. 2-7 2,50 m. 4 p.m. RN.
To Reno

Marshall and I were waiting for the 2 p.m. bus when Phil Montgomery introduced us to Mrs Paschal, later learned to be the Secretary of Doris Duke Cromwell, for a lift to Reno.

Road a mass of ruts in ice filled with water. Chains removed at Truckee.

Snow along road all the way to Reno.

A spiritual visit all the way.

Pictures and Films

* The plastic cover on the shed roof also had fallen in a mess and was being laboriously shoveled away.

I had brought up a large supply of films but now the picture was gone.

Four kinds of film are now on hand, and one of the two types of printing paper ordered.

Left word for Gerdel that cans had been weighed and I would return in the morning.

Wednesday, March 8

Returned without chains and on a dry road. Several push plows hastening up yesterday must have accomplished much in the night. *

a film of ice at either end of Donner Lake.

Analyses and Discussions

Reduced Leaks.

In copying my records, Gerdel found my depth of 10.1 in. far too small. Since his previous measurements had been checked to water surface from above and below, he investigated and found the can leaking. The seam of the bottom was opening.

Wt 10.57 lbs. was also at fault for the contents were too heavy to be weighed as a unit.

The Ideal Can

Stevens Q was defended as having fundamental qualities of space of bucket in which the snow could be melted at a fair speed as it fell and a tall chimney of fully 2 feet to hold the snow while being absorbed.

Thus under usual conditions a 2-ft. fall of snow could be taken in as it fell with little chance of the wind eroding it as it stood unmelted in the gage.

The 3-ft cans were not so effective because of the lack of broad surface below. but were at least 1-ft taller than the other cans, except the "seasonal".

The Friez had a broad catch can but a short intake.

Prestone

The Prestone can was frozen and having originally only 2 ft. total depth, had less than 10 in. (actually at end of storm only 8.3 in.) to receive the 2 ft or larger snowfall from surface 16 in. settled March 1 to 6. Total increment 31 in. ?

→ Query: How early was the surface frozen?

Can set Jan. 30. March 6	Wt 4.80 in	Dpth 4.75 in	
Weighed Mch. 6	Wt 15.97	" 15.7	
1½ mos.	11.17 in	10.95 in.	

Now diluted twice its original.

At first the snow melted in the can as rapidly as it fell. At what dilution will ice readily form? The weight of the charge (2 gal.) is approximately that of the calcium (6 in.).

→ To compare action and limitations of the two solutions.

Reserve Capacity

The reserve capacity suggested as the merit of Stevens Q was accepted as the essential standard of ideal gages.

Gerdel, using Stevens Q as the standard, plotted the weights of the others to find a correlation on basis of capacity. There were only slight indications. Evidently there are also other factors.

Large Cams

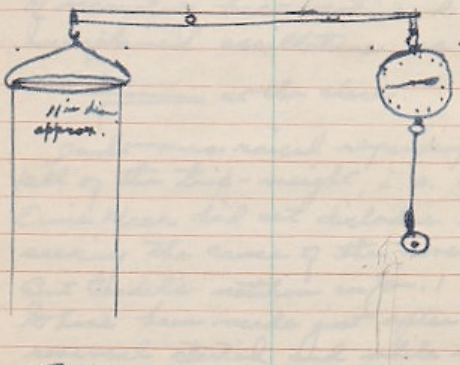
Cams of larger cross area should afford a better catch but would still have larger proportional reserve capacity unless made deeper or broader below.

A 11-in. cam (approx. twice the area of the 8-in. cam) will be tested. but will be twice the capacity of the 8-in. spring balance except for smaller accretions.

If a larger-capacity spring balance

is obtained, "some radical method of manhandling heavy loads should be devised", Gerdel suggests.

To overcome the limited present capacity of the 8-in. spring balance Gerdel proposes a lever somewhat as follows; at least 2:1



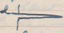
Reducer.

The Reducer may have the merit of preventing adhesions thereat the depth of the can but the 8-in. throat still gives opportunity for clogging from adhesions from

popenip or wet snow.

→ Only Stevens' method of heating the orifice electrically meets all objections except failure of batteries.

Stevens ~~Y~~. Record.

Agreement was reached regarding the general reliability of the recorder but the need of solving the mystery of recording backward* and the unexplained oscillations, as  and  at the close.

Doubt was raised regarding the fall of the trip-weight, i.e. whether Ernie Wace did not dislodge it in seeking the cause of the reversal. But Gardel's notation on Jan. 1 seems to have been made just after the reversal started and while it was in progress. This would be noticed by the ear rather than by the eye, especially if the attention was directed to other features.

If true, the weight probably was dislodged in opening the instrument.

* But was March 6.

* Snow Markers and Snowy Errors

With help of Gendel Snow Course No. 1 was staked every 25 ft as usual and two other lines were indicated by stakes for comparison.

→ He feels that Eddy's habit of sampling between his axis makes a trough along the course that fills up with succeeding snow and thus artificially increases the measure of the snow cover.

Markers may prevent this. In any case the points of sampling should be approached from the side.

The sheet will now be submitted to Stevens for analysis.

Thursday, March 9

Stevens Snow Recorder

Readjusted to lower upper hand of rest and so procure greater height of smooth wall and less jostling for snow to pile up on the can. A clever idea of Gendels in offset to my proposal to elevate the can in the rest by means of a block.

The three rods supporting the upper ring should be cut off to the present level of the ring, but since they may be choice steel axle rods Gendel suggests obtaining Stevens' consent first.

Gage erected on old telethermoscope shelf near Gage No. 1 to compare greater advantage of weighing precip. over measuring depth only. Gendel suggests that

the climat-gage measures depth in order to obtain increments of only 0.01 in. by pouring contents into smaller 1/10 tube.

3:25 p.m.
Changed and set at 9.30 in.
with calcium and 40.20 cil

Condition of Contents of Cans

Pasture
4:30 p.m.
Anem. 691 mi.
H-T Max. 57°F (Hotel 60°F)
Snow stake 88 in.

Ice Melted
Ice in all cans melted
→ Note - Study increase in temp. since storm.

Insolation Effect on Recorders

Trace of both No. 5 and No. 7

But in No 2. Stevens W it was steps

Movement of Water in Snow Crystals

Mrs. Colby, eager visitor and engineer of meteorology and hydrology, attracted me to place fine snow on a snow core on a board in the warm room.

Coarse crystals showed little color, fine crystals showed much more. The dye rode in water drops because of latter's surface tension but permeated them after the water surface was broken.

The water had drained from the coarse crystals on the surface and so color could show but little. The fine snow held much water and color.

Query: Which has greater density, the coarse dry crystals or the fine waterladen ones? What therefore is significance of crystal size and structure in snow studies?

Gordel offers as explanation for No. 2 that the mercury in the switch may have expanded and closed the circuit.

In any case the pan would not reverse to counterbalance the advance for there would be no equivalent cold to counterbalance the heat.

There had been a brief shower at 5 pm on Tuesday May 7 when Gordel came in on the train but it left no residue in No. 1 to be measured and recorded March 8.

→ The movement of the pan was tiny, seemingly smaller than for recording precipitation. But keep this carefully.

Friday, March 10

Another rain storm March 9

0.02 at 5:30 pm. "Really was 0.025 in."

Record by No 5 Friez 0.03 in.

" " No. 7 Stevens Q Not identifiable

" " No. 2 Stevens W 0

→ But the trip weight of No. 2 fell as I opened the door, tho I had scarcely jarred it. Gendel immediately suggested that my theory of vibration effects from passing trains was true and that the hook of the trip weight was gradually shaken over until some final slight jar released it.

→ If true, the friction of the hook should be increased, especially where short, quick vibrations are prevalent.

→ The pen, however, had been moving independently of the trip weight, indicating that the steps of the pen were due to expansion by heat.* The previous days had been warm, as

Mar. 7. 53°F; 8, 48°F; 9, 60°F; 10, 58°F.

→ It will be well to leave No. 2 uncovered to see if steps occur only on hot days and not on cold.

*It even moved as I closed the door, written clearly [illegible].

Snow pits - Melting faster than cooling of wire.

Then for the summer, a tarpaulin shade must be used until the expansion can be prevented by insulation or use of other metals.

Snow Surveys

Dendel had aided me with installing Stevens S. yesterday and desired further data for correlation on snow measurements by cam and sampler.

50 measurements were made at 25 ft. and mid-point intervals.

The last 3 in. of the cores were "just wet" and the ground unfrozen. as indicated by his temp. measurements. But during the past day or night most of the temperatures in the snow had risen to near 32° F. Why so quickly?

Light believes that snow temperatures cannot fall below 32° F, and cannot rise above. Bernard and I believe they can rise slightly, and certainly fall much below.

Wet Said

Wet said, melting.
But stream here is tiny but snow covered.

The Lake Norden reservoir is half full this empty last fall. Why not a gaging station below on the S. Yuba?

Becky reports the traverse at Rest muddy with runoff. The low snow that reaches almost to Reno is melting - unusual so low so late?

March 10
Av. Depth 35.9 Water equiv. 29.9
March 1 = 101.7 " 27.3
Gain 2.6 in.
But Stevens Q 3.72 in.
Evaporation or error?

Query: Do gages catch more than snow samples measured? They should.

Snow Survey data sheets for mar. 10 (3) in folder

Temperature above the Snow

Gendel argues that the temperature change with altitude per thousand feet is so small that it is useless to attempt to measure any change for 10 or 5 feet, especially since thermographs are affected by their metal and mass and difficulty of calibration. That exact measurements of humidity have been futile. Furthermore that he wants the H-T for study of forest glades and open.

But since at 10 feet in the air there is temperature of 40°F and freezing at or in the surface of the snow below, I want to determine the frontier between the 40°F and the 32°F and then seek to study the evaporation process among the crystals that causes congealing. Here one can easily be blazed in the phenomenon is clear.

The frequency of the 40°F phenomenon should also be determined. In the clear air of the west, radiation is intense and prevalent. Should

the statistical temp. of freezing be set at 28°F, 32°F, or 40°F.? Only rarely is it higher or lower. Should the elevation of measurement be 5ft or 10 feet? Elevations on buildings seem high.

Saturday March 11.

Crust

Crust at Filling Station 6 in.
Depth of snow cover 78 in.
Marked spot with dye both on surface and beneath crust.
Max. temp. 48°F; this morning 42°F
7:30 tonight 33.5°F
8:45 " 33.8

Too wet to freeze? See Humidity mean. Light storm ave.

Storms

Evening "summer rains" Tues. Mch 7 when Gerdel got off the trains; Mch. 9, when 0.025 in. was caught; and a thunder rain-snow storm this evening, continuing into persistent precipitation.

On Friday Gerdel noticed that the barometer had been falling for several hours accompanied by intermittent or

mares tails" in the sky. He forecasted storm.

Stevens Snow Can leaks

abb. Stevens S.

Wt at setting (incl. g) 9.30 in.

" Today after 0.025 (No. 1) in. Nelig 9.21 in.!

The valve in the bottom was found dripping slightly. Should order more gaskets. Will calcium rot them.

→ The valve is scarcely necessary for the can can be readily picked up by a bail and emptied. It also may easily become a source of loss and may not close tight after once being opened because of the calcium sediment.

Tightened the valve for further test with No. 1

Forecast to Paget

Sent summary of snow survey to Paget's office charges reversed. Will be placed on his desk for Monday morning.

Finally decided not to send

the item to the Reno Gazette.

Wind - Average and Maximum near Summit

Call on phone from Mr Noyes of Nordan for Mr Rogers clerical engineering expert on tunnels and snowsheds for Southern Pacific.

Mr Rogers wants the average and maximum wind velocity over the Sierra. I told him of the two big winds of Jan. and Dec. 1943 but suggested that he use data from Donner Air Weather Station

in Denman Pass thru the Civil Aeronautics Authority.

He wants to call next week. I promised that either I or Dr Gendel would be here to meet him.

Leases at Soda Springs

Called on Dennis Jones to arrange unfinished details of leases.

1. He desires no rent for the use of the tin garage for our present storage. Nothing of ours is in the way of autos. We are welcome.

2. He countersigned the copies of the leases of the pasture lot. These had been lost in his baggage last summer. Muriel Jones will sign later in the day.

3. He will sign present lease to the first floor back of the filling station with the proviso that the lease will be subject to termination or readjustment whenever

the Filling Station itself is leased, but he wants the "Weather Station" continued at Soda Springs and will do all in his power to aid us to continue our lease.

For the present the Filling Station cannot be opened because of OPA restrictions and probably not until the close of the war.

It will not be satisfactory for the Hotel to run the Station in conjunction with other service because of delays to the customer and resulting unfriendliness to the Hotel.

A lessee may require the entire building tho he would be willing to rent the front with or without the upstairs.

The rent of $40 for the rear will scarcely pay the interest on the cost of the entire building.

He will amend and sign all leases (he and Muriel) later in the day.

He has now received one check (returned by bank because of lack of signature on front and back) for December and January. "Another check of $80 for February and March is on its way; and if satisfactory to the Experiment Station hereafter rent will be paid in advance.

He has full confidence in the trustworthiness of us all and so does not desire further guarantee even of the lease.

"Van Evera may place several boys upstairs this week end." The apparent overflow at the Hotel is caused by the fact that none of the dormitories have been opened this season. Beacon Hill and Donner Summit Lodge even with dormitories have been full.

Dr. Gerdel has requested that each time a check is sent by the Experiment Station for rent a bill for half the amount be sent also to him. This with his

cancelled check will be evidence to the Weather Bureau that he is paying his own expenses for which said permitted an expense account.

Gages Liquid

Water in all the gage cans. Snow and ice have wholly disappeared.

Stevens W Stable

Today cooler the max. 56°F recorded. → Check this. The sky was partly overcast.

The line of the pen was straight as expected.

Study the degree-hours in the higher 50°s and the sunshine to see if the insolation causing the expansion by Stevens W can be determined quantitatively.

→ It was hoped that the aberrations due to sun could be separated out from the records of precipitation by taking two sips but the record of March 10 disproves this.

Insulation of the case or change in metal seems necessary.

→ Study possible increase in amount of aberration with increase in seasonal heat of the sun and intensity of sunshine

When factors have been determined use the tarpaulin again.

Plainly the phenomenon is caused by heat not cold.

Tucker Sno-Cat

Rolled in this evening for a publicity stunt with a Pathé news man. James Dodson of Telephone Company also with it. Feels that he must have a Sno-Cat. Maltman is directing a night "rescue trip". Flares will be used.

Tucker called in the evening. Grateful for my letter to the Quartermaster Office.

During our heavy storm of last Sunday he was hauling supplies up Bear Valley from Emigrant Gap to Bowman Dam for PG+E and Nevada Irrigation District.

The spray oil system on the Chevrolet failed. The Ford has forced feed.

The trailer runners also broke off.

but the Cat dragged it sometimes upside down.

Two trips necessary on foot in the snow to bring repairs.

The Nevada Irrigation District is grateful for the emergency service.

Mattman came over for a flashlight, but I gave him two bulbs for the camera.

In the night Becky called me to see magnesium (?) flares illuminating the buildings beyond the tracks. The Cat had gone toward Sugar Bowl and was now being photographed near home.

Sunday, March 12

45 got off the early train. Ski suits, fewer skis. Mostly women. "Total on Beacon Hill for the day 225. Not the old days."

Storm Continues

Sno. Cat

The party went away again at 9:30 am. Returned and departed in the evening.

Deep ruts thru the Pasture and along the Sugar Bowl highway. Fortunately did not trample my snow markers.

Waltman looked weary. He had had my seat on the stern and been thrown off "twice".

Snow Crusts

Temp. 8 am. 31.8°F

9:30 am snow wet. No crust.

11 am. 41.4°F

4:15 pm Pasture 31.6°F. Snow is wet.

Because of storm there was probably no crust in the night of Saturday.

4 pm

Gage Measurements - 24 hours

No. 1 Stick	0.45 in.	0.45 in.
Stevens S	9.64	0.43 in.
	9.21	
	0.43 in.	
No. 2 Stevens W	. . . .	0.50 in.

No pumping - Max. Temp. 50°F

Friez	. . .	0.50 in.
Stevens Q	. .	0.46 in.

Wood covered by water or slush.

Stevens S

. [illegible] gage is fully adapted [illegible] in competition [illegible] gage. [illegible] ance is graduated [illegible] easily be estimated [illegible] ming stick by use of

Stevens S.

"Balance subject instrumental error as compared with stick" - RWG -

Snow Arch on Roof

The snow arch melted so greatly that heavy chunks of it (some 30 lbs?) fell into the pathway at the steps and some smaller pieces fell further.

The head man banked and entrance changed to the rear of the porch.

Wanda or others of us could have been killed. Bacon brought the mess to my notice.

Gages Still Liquid

Every gage is fluid. No trace of snow or ice in any.

the smaller tube can be read to .01" directly, the standard adopted for reporting.

Could Stevens S be placed at Donner Air Station for the easier weighing of daily precipitation? The wind might blow too strong for accurate measurements at all times.

If the stick gage is taken inside for measuring, possibly it will be more convenient & the observer to handle both cans alike.

Dye on the Snow

In the evening after 24 hrs the fuchsine had penetrated only a few inches tho the snow is moist.

Where dye is red, the snow packed moist, but lower the snow crushed moist and packed.

The colder snow was not water conducting. Evidently the progress of the color indicates the passage of water, and snow may not be

water bearing the slightly moist.

Problem

How does snow in midst of snow cover become alternately moist and frozen day and night?

Is snow therefore a faster conductor than believed? Can moisture penetrate with thawing without actually transporting water? Are there degrees of moistness?

What is the significance of "quality of snow" except free water in it?

Benson Hill Lodge

Called to visit Mrs Johnson.
The lodge is homey like a cabin not rather than a hotel.

Temperature

8 pm. 30.8°F

The barometer is trending down.

Monday March 13
Writing journal last night till 10:20.
Becky and family took the train at 5pm

Storm from East
Hail or sleet rattled on the Quarters during the night.
Barometer took another drop. .20 in.

8am. Heavy snow.
10am. Snow lighter and swirling - Some wind. Temp. at Quarters 21.3°F

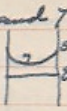
Inspection of Cans
Metals.
Stevens S. Pudding slush 18 in. below rim. Water drop hanging to cap of outlet.

Plastic
Ice in can with wet surface. 12½ in. below rim
Plastic rim clear.
Contour of snow

Edge grows 9 in below rim, Center 11 in.

No. 4 Ice in bottom 8 in below rim.
Snow cover 6 and 3 in.

Prestone
Ice 8 in. below rim.
Snow 5 and 7 in.



No. 3 Army Engineers
Soft slush.

No. 2 Oil, fluid surface. Inner can insulated.

No. 1 Snow 18, 22 in. below rim.

No. 5 Frigy

Soft slush.
Thin but uniform adhesion of crystals inside of bucket but only a few in orifice.

Temperature

On Platform 16°F by H.T.

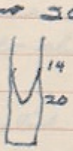
But at Quarters 22.8°F

Strong E wind - approx 20 mi. per hr.

Pasture

No. 10 Water at bottom but snow rides on it.

Snow 20, 14 in. Deep funnel shape



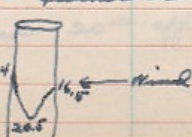
Clouds of snow cut from crest of dam and blowing SW into forest.

Deep diagonal channels along entire top of dam.

The Tucker Sno-Cat nuts are filling up.

No. 9 Snow 14, 16.5 and 20.5 below rim.

The higher lip of snow is opposite the wind. Funnel as in No. 10.



No. 6 Liquid soft below.
Core of snow in can uniform.
5.5", 8 in.

No. 7 Stevens Q
Chimney 19 in. tall. Inside to surface 35 in.
Soft slush. Insulated partially.

No. 8 Solid below. Snow rim uniform.
Near Therm. Shelter 9, 10 in.

Temperature
H-T 15°F. Current min. 13°F
at Quarters 25°F Why?
New Snow
2 & 1½ in. deep in Pasture
Snow Stake 82 in.
Wind 20 mi. approx.

Freezing of Cans

Contents of cans turned from fluid to solid in single night from 50°F to 16°F. Check this. Fluid yesterday.

Large storage gages wholly or partially filled, Lawrence insulated cans.

Capacity

Reserve capacity abundant in seasonal storage cans for any emergency.

Stevens Q good for its total weight.

Fries Fair, probably for 10 in. precip. gage.

8-in cans freeze too quickly. Even Nos 9 and 10 are limited despite their 3 ft. depth because of freezing.

The oil seems to melt the snow readily if not frozen. Frozen oil like grease is slow or impervious.

It seems moreover to be the chemical rather than the oil that freezes.

Wind Effects

The wind seems to swirl over the bottom of the deeper gun cuts and deposit the snow around the edges even if it does not erode it.

In Nos. 9 and 10 the effect was funnel, in No. 6, 7, 8 bowlike.

In No. 9 the cutting was more pronounced from the side of the wind.

When the cut is shallow, i.e. the snow nears the sill, the eroding is uneven as in No. 9

In the gages where brackets widen out beneath the orifices, erosion effects or contours are slight. This is true also in the storage gages Nos. 2 and 3.

Do

Weigh cuts tomorrow and make snow survey. See if any snow has been blown into Nos. 9 and 10.

- Dye -

A bit of fuchsine was put on the new drifting snow flakes.

No change in color occurred tho evidently the grains settled into the flakes and made a slight depression.

The later snow covered the dye. The wind has eroded the snow at the base of a tiny wood marker.

Weather Improving

At 2:30 pm. the barometer is rising slightly and the sun has appeared. Snow scuds race over the snow cover. More skiers are going south a few - men and women - braved the weather this morning. Some sought the shelter of the timber.

Temp. 33.3°F.

5 pm. Pasture H-T 18°F; Current min. 16°F.
at Headquarters 22.8°F.
8:15 pm. Heights - - - 14.0°F.

But sweet swirling down road from Soda Springs to Donner Summit Valley as if in a wind tunnel. Stings the eyes and temples.

– Stevens S –

Wat. eq. precip. since last sweep 0.25 in.

9.39
9.64
0.25

But 3 large drops on cap of inlet. Leak?

No. 1 close to roof of therm. shelter.

How any drift snow from roof blown into can? 0.34 in.

Views

6 views Mch 12–13.

Snow arch, yesterday and today

Stevens S being weighed and compact.

Drift snow in Pasture and on Jam.

Some views at 10 pt. Should have been 15 pt.

Fuchsine

Scattered like powder was dye from the bit put on the new drifting flowers. These were unnoticed at first but soon showed up like red algae on the snow when the sun came out and touched the snow. The powder had been spread wide like a flash.

The original bit of dye remained shaded and green.

New snow becomes moist quickly and permeated with moisture. Thus the rapid, broad and deep spread of the dye.

→ Does it have higher "snow quality" than older snow?

Tuesday, March 14

Lucky, plain lucky!

I planned to return to Camp yesterday but decided to remain in order to reweigh the cans and make the snow survey.

By last night was cold, this morning the snow drift was in the form of sand. Useless to go out. Plainly the east wind was the last stage of clearing and the barometer was rising.

The snow surface was moving too much to survey it until it had become fixed by freezing or insolation.

So I stayed in to do home work.

Cold

at 7 am. Temp was 9.4°F
8:30 " " 9.4
10:30 " " 16.8

For night ... Min. at Hotel 8.0°F.

As I sat in the kitchen a drop of water from the ceiling was

noticed, then increasingly more. The door to east upstairs room was closed. A valve on the hand bowl was leaving.

I went to Hotel for a plumber. There was none but Dennis Jones came over. Water was now pulling on our doors in the office. A second valve had burst pipe. This could be closed and I could mop up.

What if I had decided to face the wind and gone to the field?

Gerdel had frozen pipes beneath him last winter. But this is still a palace.

"Drainage" Waves in Snow

The drainage waves have reappeared on Beacon Hill this morning.

Are they not wind erosion marks? Far more than wind ripple marks.

Photograph and watch them.

The driving sand in the face has given place to the higher cumulus. Skiers have gone to the hill.

Dye

(a) The tiny bit of dye set on drift snow yesterday is brilliant red today in direct rays of sun.

Dye has flowed beneath tiny fallen stick that radiated heat. The dye also has concentrated beneath a tiny thin crust like a window pane. Again insolation. This snow feels moist.

But the dye has penetrated an inch approx. in new dry snow that feels dry.

Reproduce this experiment.

(b) Other dye placed on wind crust today at 3pm. remained green. Apparently crust grown cold or made cold.

at 3:30 still green.

No. a stone is growing purple in the cold wind.

Stevens S.

Safe slush in can.

Still 2 drops water on cap.

Stevens W.
Line surrendering.
Rain has moved
4 pm Mch. 12 to 3:15 pm Mch. 14
0.16" = 0.32 precip.
in 5 steps, 1 at close of storm Mch. 12
4 on Mch. 15.
No precip. today. Snow scuds
from drifting snow.
One step = 0.06 approx. Quite
uniform.

Ice in Cans

Stevens S.
Slushpan floating. Oil above and around. Recently changed.

Plastec
No. 4
Prestone } frozen.

No. 2 Stevens W. Slush and oil.

No. 3. Army Engrs.
Sponge fce, oil covered. Can be
penetrated.

No. 5 Frig. Slush and oil.
Recharged 2 mons ago.

To Reno

Am 5:10 pm train. Gardel could not get aboard.

Snow all the way to Reno, and still on the ground there. Min. Temp. at air port 5° F. Coldest March at Reno in 17 years. at Soda Springs 8° F.

Left Note for Gardel

(a) Watch the drop upstairs
(b) Will return Friday to weigh cans after the period of erosion was over. and the snow cover became anchored and stable.

Rec. Gage No 3.

Total in gage July 26
76.03

Total Depth 14.6 in. = 69.5 in

× Corr. factor 1.015 4.5
= 70.57 in.

CORRECTED COPY

Comparison of Precipitation Gages
at Soda Springs near Donner Summit,
California
(Inches water equivalent)

Date 1942-43	Hotel					Pasture					
WINTER Nov. 1-Apr. 1	No. 1 Unshielded	No. 2 Stevens W	No. 3 Army Engrs.	No. 4 Check	No. 5 Friez	No. 6 Check	No. 7 Stevens Q	No. 8 Unshielded	No. 9 3 ft. deep	No. 10 3 feet deep	Snow Survey
	51.03 = 141.8% of normal (Nov.-Mch.)	Batteries failed			56.25		53.51				38.4m 98.2% of Apr. normal
Dec. 1-June 1 Adjusted	43.05 = 137.3% of normal (Dec.-Mch.)		47.66 wt.	45.42	48.33	50.62	47.05	42.67	50.18	51.54	0
April	2.60		2.50 dpth.	~~41.55~~ 4.155	3.83	3.87	3.72	3.55	4.09	4.15	11.8
May	2.23		2.88 dpth.	2.38	2.34	2.23	2.22	2.05	2.37	2.39	0

From Notebook II Jan. 19, 1944

Comparison of Precipitation Gages
at Soda Springs near Donner Summit (Continued)

(Inches water equivalent)

Date 1943	Hotel					Pasture						
SUMMER	No. 1 Unshielded	No. 2 Stevens W.	No. 3 Army Engrs.	No. 4 Check	No. 5 Friez	No. 6 Check	No. 7 Stevens Q	No. 8 Unshielded	No. 9 3 feet deep	No. 10 3 feet deep	Snow Survey	Remarks
June 2-25	0.40			0.77	0.42	0.75	0.60	0.68	0.78	0.78		
June 26-July 10	0.25		2.0	0.25	0.21	0.24	0.20	2.26‡	0.25	0.25		No evap.
July 11-25	0.14	Reset	Recharged (dpth. 4.45 in.)		0.14		0.03					
July 26-Sept. 1	0	0	-0.12 (dpth. 4.33	-0.01		-0.03	+0.02	-0.01	0	+0.01		Slight evap.
Sept. 2-24	0	0		-0.01	0	-0.01	0	-0.01	-0.02	-0.02		"
Sept. 25-Oct. 1	0	0	+1.0 (dpth. 4.50)	+0.04	0	+0.01	0	+ T	0	0		No evap.
Oct. 2-Nov. 1	2.64	2.56	+1.0 (dpth. 4.90)	2.88	2.80	2.79	2.88	2.55	2.95	2.97		
Total June 2-Nov. 1	3.43		2.0	3.92	3.57	3.75	3.73	5.47!	3.96	3.99		

Comparison of Precipitation Gages at Soda Springs near Donner Summit (Continued)

(Inches water equivalent)

Date 1943-44 WATER	Hotel No. 1 Unshielded	No. 2 Stevens W	No. 3 Army Engrs.	No. 4 Check	No. 5 Friez	No. 6 Check	No. 7 Stevens Q	No. 8 Unshielded	Pasture No. 9 3 feet deep	No. 10 3 feet deep	Snow Survey	Prestone	Hotel Plastic	Reducing Colle
Nov.16-17	0.06	0	Rechgd. (dpth.15.2)		0.07		0.08							
Nov.19-22	1.29	1.28			1.71		1.70							
Nov.-1-22	1.35	2.08			1.78		1.90							
Nov. 2-Dec. 1	1.94	2.72	1.0 (dpth.15.3)	2.55	2.42	2.41	2.50	2.21+	2.63	2.65	0			
Dec. 2-Jan. 1	2.82	(Reversed)	3.0 (dpth.15.9)	3.05	2.55	2.89	2.93	2.43	3.15	3.10	15dpth.			
Jan. 2-17	3.38 Jan. 5 16 in dpth.		5.0 (dpth.17.6)	4.70	3.85	4.25	3.10	3.07	4.72	4.80	29dpth.			
Jan.18-Feb. 4	5.54		11.0 (dpth. 20.6)	6.03	5.~~99~~	5.72	7.43	5.02	6.60	6.60	Feb. 1 (48.7dpth) (12.2water	Set	Set	Set
Feb. 5-10	1.37		-4.0 (dpth. 19.5)	1.59	?	1.34	1.51	1.02	1.80	1.59	Feb. 11 (57.5dpth) 18.1 water)	1.21	1.37	1.43
Nov. 1-Feb. 10	15.05= 41.8% of N.(Nov.-Mch.)		15.0	17.92	14.51 16.18	(-Normals- (Precip. Nov.-Mch. 35.98 in water equiv.) (" Dec.-Mch. 31.36 " " ") (Snow Cover Apr. 1 38.6 in.water equiv.)								
Dec.-Feb. 10	13.11= 41.8% of N. (Dec.-Mch.)					16.61	17.47	13.75	18.90	18.74	Feb. 11 18.1= 46.9% of N. Apr. 1			

(12.2+ precip. = 16.08 Feb 9).

SNOW COVER AND WATER PROSPECTS FOR NEVADA

MARCH 1, 1944

EASTERN SIERRA

Snow Cover 60%, normal expectancy for March 8% Additional

Water supply fair to ample.

Humboldt Basin

Snow Cover 76%, well heights fair

Winter Runoff 68%

10% of land abundantly supplied, 90% poor to fair.

Little Humboldt

54%, poor.

From Notebook II Feb 29 1944

FEDERAL AND STATE

COOPERATIVE SNOW SURVEYS

State California

Drainage Basin Feather Springs

Snow Course Sierra Experimental

Party Church and Reed

Date March 10, 1944

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	1	82.5	7.5	83	108.5	25.5		Wet on bot 3"
	1.5	93.0	91	82.5	115.9	33.4		
	2	90.5	87	82.5	114.0	31.5		
	2.5	83	81.7	82.5	112.0	29.5		Water bot 3"
	3	85.5	84	82.5	112.0	29.5		Wet bottom
	3.5	82.5	80.5	82.9	112.2	29.3		
-1" ice	4	87.0	82.5	82.0	114.5	31.5		Trench -1" depth
	4.5	80.0	77.5	82.5	111.0	28.5		Last 3" ↓
	5	81.0	78.0	83.0	112.0	29.0		Just wet
	5.5	83.0	79.0	83.0	114.0	31.0		wet
	6	84.0	82.0	83.5	114.0	30.5		↓
	6.5	84.5	75.0	82.0	114.2	31.2		
	7	86.0	85.0	83.0	112.0	29.0		↓
	7.5	82.5	78.5	83.0	113.0	30.0		
	8	85.5	84.5	83.0	112.5	29.5		

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No. 1 of 3 sheets. Comp. by R.W.C. Checked by _____

FEDERAL AND STATE

COOPERATIVE SNOW SURVEYS

State California

Drainage Basin Sedan Springs

Snow Course Pasture Experimental

Party Church and Gerdel

Date Mar. 10 1944

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
Course	A	8.5	76.0	71.0	83	108.0	25.0	6" apart in squares near platform
3"	B	8.5	76.7	72.8	83	108.6	25.6	
-½"	C	8.5	89.3	85.0	83	113.3	30.3	
	D	8.5	89.8	87.2	83.0	113.8	30.8	Use C or D
		9.0	91.7	90.0	83.0	115.2	32.0	
		9.5	88.0	84.5	83.0	114.5	31.5	
		10	26.5	84.5	83.0	114.0	31.0	
-1½"		10.5	84.0	82.5	82.5	111.0	28.5	
*		10.5	84.0	83.0	82.5	111.6	29.1	Crack after last core
-½"		11	83.0	80.5	83.0	111.8	29.8	Dirt ½"
-½"		11.5	89.2	83.0	83.0	114.7	31.7	
		12	84.5	71.0	83.0	113.0	30.0	
*		12.0	87.0	84.3	83.0	113.8	30.8	Repeat core short dirt in end of tube.

*Show number or description as given on sketch map, i.e., "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No. 2 of 3 sheets. Comp. by R.W.G. Checked by.....

FEDERAL AND STATE

COOPERATIVE SNOW SURVEYS

State California

Drainage Basin Soda Springs Experimental

Snow Course Pasture

Party Church and Gardel

Date March 10 1944

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	12.5	79.5	78.5	83.0	110.6	27.6		
	13.0	91.5	89.0	83.0	115.8	32.8		
av. 1-10		85.9				29.9	× 34.8	Mch 1 27.3
1-12 inc.		86.5				30.4	35.1	Mch 1-10 2.6 in.
					×	77.5 %		Stevens Q. 3.72 in.
						of Apr. 1		

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N 5° E," etc.

†Always start measurements for sampling from the *initial* point as shown by the sketch map of the course and follow the spacing for samples as indicated. Particular care should be taken to note any *irregular* spacing between samples.

No. 3 of 3 sheets. Comp. by RWG Checked by

	Mach 1	Mach 6	
No. 6	12.28	13.70	1.42
8	11.57	12.88	1.31
9	12.80	15.35	2.55
10	13.08	15.78	2.70

Q Mach. 1

12.90

16.65
12.90
3.75

From Nazbook II, March 6, 1944

.520).3000 (.57
2625
3750
3675