TRU-LINE

WIRE-O

STENOGRAPHIC NOTES

No. 4

From February 20 1943

To March 12 1943

No. 18-G

Soda Springs - February 20, 1943

Road dry. Snow on ground only from Hamilton up.
Limited thin fog only from Boca to Truckee. Emigrant Gap found same condition Feb 14 on trip up.
Ice on Donner Lake and open areas near center from foot to head of lake.

Cornices on east side of Donner Pass have broken off. Snow-ball rollers becoming frequent. Snow movement from trucks and ribbons to rain sign. Entire east slope of Mount Pinchot loaded.

Snow frozen and hard at Soda Springs. Gentle, mild breeze. A spring day on snow.

A Week without Precipitation

	Max	Min	Prec.	Snowfall	Snow on Ground	Wind	Clds
Feb. 15	64	7			87	LSE	Clr
16	64	11			85	LE	Clr
17	55	12			84	LE	Clr
18	60	19			82	LE	Clr
19	54	24			80	LSE	Pt Cldy
20	59	24			77	LE	Clr

No precip. and considerable settling. Any melting?

Snow Crusts and Melting -

Hotel 9:30 am.
Snow packed and apparently hard.

9:50 am.
Upper crystals moist and snow packs but crystals are coarse.
Air Temp. Min 44.5°F; H.T 43.5°F
light wind; thick overcast.
Min last night only 24°F.
Snow Temp. on surface, in shade +5.6°C (42.1°F)
5 minutes later +6°C (42.8°F)
Surface of snow in shade moist but hard; in sun, snow is moist 1/4 in. deep and packs.
Air Temp. now Min 45.5°F; H.T 45°F

10:30 am.
Temp. on snow +8.7°C
9 in. beneath surface +0.1°C
31 " " " 0°C
57 " " " (on ground) +0.5°C (Corrected reading)
57" a sec. reading by another thermometer in another spot (Ground and grass roots) ... +0.5°C. Snow packs (but naturally since temp. is above 0°C)
Top crust (from yesterday's melting?) 7 in. deep
Consists of coarse ice-crystals.

Beginning to break thru top crust and to look consolidated snow below.

→ Here is opportunity to study latent heat of melting. Water in higher edge freezes very slowly. Tube radiation factor.

Pasture*

Sunset and overcast

Surface of snow becoming dry.

6:20 p.m.

Temp. Min. 41.5°F; H-T 41°F

Crust now frozen 3/8 in. deep.

Air surface of snow (still moist) +0.6°C.

Air frozen crust +0.6°C to +0.5°C.

No freezing due to radiation from porous crystals. Temp. air surface still above freezing. Yet the sky is overcast and radiation necessarily slight.

* Midnight Temp. in snow at 3 1/2 in. depth 0°C
" " 75.5 in. (bottom) +0.2°C
" " 76.0 +0.1°C (Ice crystals moist)

Snow Cores

		Depth in	Core in	Wt. of Tube + Core	Tube	Water Equiv. in	Dens.	Remarks
Course No. 1								
Station	8	77 −1 76	69.2 −1	82	116	34	44.7%	Soil moist & packs; also sheet at bottom which is very gray under lighting.
		Rest of core also compacts but is not so moist						
	9	75.5 −1	50.3 −1	82	108.2	26.2		Ground moist.
		Some of teeth bent in. Hence poor core.						
Remarks.		75.5	66.2	82	116	34	48.9%	Coarse crystals at bottom

Teeth straightened 34.34 = *

Rain since Feb 13 . . . 2.9 in (thy no freeze)

* 81% of above normal.

Analysis of Strata in Snow Cover

Stratum 1-
Surface to 1st Crust 2½ in. inc. Crystals 2-3 mm and cohesions

	D	C	Surf.	Total	Water Equiv.	Dens.	Remarks
2.5	cm	82	83	1		40%	Moist, packs

Stratum 2
To 2nd Crust 37 in. Crystals 1 mm. Dry pack

37	36.8	82	95.6	13.6		36.8%

Stratum 3
To 3rd Crust Crystals 2-3 mm. Dry

—	13	82	88	6	46.2%

Too deep in pit to read graduations on tube.

Stratum 4
To 4th Crust or Bottom Crystals 1-3 mm but forgen into larger groups

—	23.3	82	94.6	12.6	56%	Too forgen to pack much.
	−8					
	22.5					

	Pkd. core		Water	Dens.
Total Depth	74.5	74.8	33.2	44.6%

* Av. 7 Nov. 8+9 · 75.8 | D 34.0 | W

Snow Stake . . . 73 in.

Summary. -

The recent snow settled * 36.8% dens.; is lighter than the surface stratum which represents the most vigorous melting and suspension of the past week.

States 3 and 4 have been subjected to much rain and the latter (No 4) has become a series of coarse ice crystals. The intermittent heat and cold has turned the precipitation into water with little chance of escaping.

Comparison of Precipitation Gages

Total

Natal -

No. 1 - Standard Unshielded. 0 in.

No. 2 - Stevens W . . . Opth 10.6 in.

Frozen this morning, this afternoon ice core floating in center 4 in. a/p/e. from edge of trace. Not so deep. Stevens effect not so great.

No. 3 Army Engineers. Same depth as Feb 13. 0 in.
Light contents. Did not stir.
No. 4 Standard Shielded (This morning also)

	Feb. 13	Feb 20	
	13.95 in	13.95	0 in.

liquid; stirred (liquid this morning also)

No. 5 Friez. No more or fell in trace 0 in.
Did not stir.

Pasture -

No. 6 - Shielded

	Feb. 13	Feb 20	
	10.75	10.72	-0.03 in.

liquid; stirred.

No. 7 - Stevens Q

	Feb 13	Feb 20	
	Trace 5.20 in	5.10	-0.1 in.

Liquid. Did not stir. Ice still plentiful. (B)

No. 8 Standard (unshielded)

Feb 13	Feb 20	
9.20	9.16	−0.04 in. *

10.95
9.16
1.79

* Can warm.

Liquid; stirred.

No. 9 Shielded

Feb 13	Feb 20	
12.48	12.47	−0.01 in.

Liquid; stirred

Bottom of can 18 to 27 in. above snow.

No. 10 Shielded

Feb 13	Feb 20	
12.42	12.38	−0.04 in.

Liquid; stirred.

Bottom of can 12 to 18 in. above snow.

Summary:

No loss (i.e. evaporation) at Hotel, but from 0.01 to 0.04 in. in Pasture and 0.1 in. at Stevens Q. Cans No. 9 and No. 10 were 3 ft. but Nos 6 and 8 were 2 ft. deep.

→ Why no evaporation loss at all at Hotel? Why did the snow even gain 2.9 in.? Drifting? But not in gages.

c

Resetting Hygrs. thmographs

11:05 am. Slightly overcast
Hotel - Dry 50.8°F
Wet 38.8°F

11:45 am
Pasture
Temp. for period { Min +3.4°F / Max 6.8°F } Reset, both 47.6°F

At Noon - am overc
Dry temp. 48°F
Wet 37°F

→ Easy to reset in mild weather
But to permit pen to run over, it will be best to fasten the sheet on with a metal spring or rubber band. Otherwise the pen will catch in the crack or fail (esp. humidity pen) to spring back to the sheet after passing over the hump.

Sunshine Recorder

Sunrise approx. 9 am.
Disc or sun just becoming defined. Shadow is weak. Mercy. column 1/2 in. below contacts.

10:15 am.
Sun higher. Disc dim but round. Still overcast thinly. Mercy. column only 1/4 in. below contacts.

11:05 am (Min. 50°F; A-T 49°F)

Sun coming into thin feather edge of cloud. Cloud is of medium intensity. Mercs. column now up to contacts.

NB. It recorded on triple register 10:55 am

2:15 pm

Sun is just in thin film of cloud. Mercs. column just in contact. Is it recording? See sheet removed Feb 21.

Midafternoon

Sky overcast. No shadows. Mercs. column 3/8 in below contacts. See sheet now on triple register.

3:30 pm

Sun out again in thin film of cloud. Mercs. column in contact.

Summary -

Sunshine recorder in fair adjustment. When light is weak in morning during presence of haze or fog, sunshine recorder fails to respond. Better in afternoon when the air is clearer.

Curley reports the triple register running properly. Watch all contacts.

Cornice on Beacon Hill

Viewed cornice thru field glasses. There is a high melting but no evidence of breaking off as on the cornice on eastern face of Donner Pass.

The artificial snowsheds at the railway were dismantled today or taken away.

Personal

This morning a little mother went skiing with two little children and a tiniest one on a child's sled.

She was laboring to fasten the small ski into put too large before putting on her own. A Dutch family going skating or a Danish family going on bicycles

At 4 pm a full hundred on Beacon Hill, Warden Lane, and trail. Among them on the trail was a tiny sled and child.

Ice Lakes has its diesel tractor out and has dragged a large gondola from beneath the snow. Now loaded with baggage and is waiting to turn some of the skiers over the pass.

They went later turned behind.

Soda Springs is overcrowded — even five in the office and some in the bathtub. I can complete my work and catch the 9:15 p.m. bus home.

At 6 p.m. the caterpillar from Sugar Bowl broke a trail into Soda Springs over the settling snow. Traces possibly one foot deep.

Any bad bits would ground flying beneath the seven-foot planing beneath the snow with insufficient water. Was that the stench last year beneath the platform? a peril to health next summer.

But when he cleaned the basement for mass tomorrow morning, his outburst was original:

"Firing up for service tomorrow just when I have a heavy Saturday. But there won't be three people there. Christ, why don't they give him $10 and let him stay home?"

Needs

Sand and scissors for record sleeves. Also a file for sampler cutter and a machine spline for splicing (really for things on sound track)

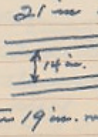
Measurements for Equipment

To steady ladder on Frieg Tower
(a) Fasten ladder against slope of tower as originally planned
(b) Brace the ladder from bottom of tower to prevent swaying.

Ladder:
Width outside 24 in.
Bottom of tower 62 7/8 in (63 in)
Top of tower 43 3/4 in
Height of tower to platform 174 in (14 1/2 ft)
Outer edge of ladder to surface of tower
(a) at top 6 7/8 in
(b) Ladder from bottom 31 in.

Telethermoscope

Height of top of shelf on platform from ground 96 1/4 in. (8 ft)



Feb. 21 (Conference with Fred Pierson, Ernie Wack and Dr Baldorf).

Supporting battens 2×2½ pieces, 3 67/8 in apart with cleats every foot up beginning at bottom and continuing 8 feet.

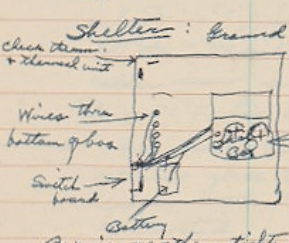
Cleats are to be set in 1/4 in. and opposite cleats staggered sufficiently to screw binding to base cleat.

Binding board [ ] of hard wood to hold thermometer cables without slipping. Top of cleats to be sharpened to cut settling snow.

Query: Will settling still catch the thermal units and tear them loose from the cables? If so, a roof must be placed over cleats directly above them.

Slot and entrance hole are being made for pass through cables in base on which unit is soldered when latter will be damaged in soldering.

Shelter: Ground plan



Snow Thermometers

Dr Baldorf prefers the thermal units of the snow cake thrust into the snow with a staff because the reading can be protected from air currents in

the hole and the reading can not be subjected to distortion by pulling the instrument up to read it.

He agrees, however, that a wad of cotton thrust down the sampler hole to the top of the thermometer would play it against air circulation from the higher levels of the snow. Then cotton could be fastened to a long stick or to a string for pulling it up. With the sampler, holes can be cut where a staff could not penetrate and with greater security for the thermometers.

1 doz. Fahrenheit thermometers are now here but they are graduated only to 10°F, practically the same as the Centigrades. Consequently, for colder snow a thermometer graduated to −50°F has been ordered.

→ We need corks to mount the set in glass tubes — 1½ to 2 cm in diam. The Physics' supply is exhausted.

Dr Leifson will get a student to mount them.

Latent Heat of Melting

Thermos jar satisfactory except that plastic over the rock wool may be melted by hot water in the jug. But Jack Ryan thinks that a shellac coating may prevent this - the plastic is made soft & ferment its cracking on batteries.

Prof. Blair says that a vacuum in a thermos bottle is better than confined air as an insulator for the air may set up convection currents between the walls and thus assist in the release of the heat or entrance of cold.

The jug weighs 3 lbs 1 oz -
a pancake of metal will be placed on the opposite plate to counterbalance the jug. Then an additional weight on a protruding rod can easily counterbalance the hot water when placed in the jug.

Since the scale limit is 10 ozs and a pint is approximately 16 ozs, only a half pint of water can be used and the snow can not exceed 10 ozs (1 oz = 1 in. by Utah cutter). The water must therefore be

150°F or hotter than the hand can stand to melt its own weight of snow. Surely that the Army will let the Eskimos to use the Kotik and boiler room. I shall need 10 in. of snow, to get good samples of density and keep the temperature of the snow constant while the core is being cut and placed in the jug.

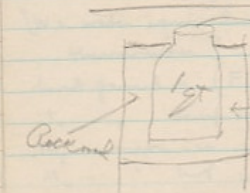
The present weight of the jug will not affect the sensitiveness of the balance beyond 7/10 of a gram or far less than 1/15 of an ounce. (1 gram = 1/30 oz) Friction on knife-edges of balance is therefore not a factor. Error less than 1%; this quite satisfactory in field work, and quite sufficient to show the relative resistance of the various types of snow to melting, such as temperature, density, and crystal size and texture.

A broad cooperative effort:
Dr Baldorf technicians on entire project; Dr Leifson, thermometers; Fred Pierson woodwork; Ernie Klaer, installations; Tim Wilson, cores; Flanigan Hardware Company, rock wool and Brown-Wilbery, completing thermos jug; Jack Ryan, instrument makers; Bob Kerr, the jaw.

$M_{\frac{1}{2}}$ = inches of mercury (vac)

t_H = temp. hot water.

t_c = temp. of water at completion of melting or minus of descent of column.

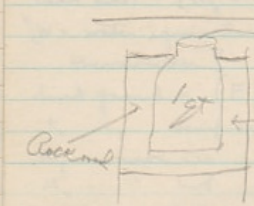


all will probably be ready by the end of the week

Formula - for latent heat of melting

$$\frac{(M_W + W)}{M_I}(t_H - t_c) = F$$

$M.W.$ = inches water in jar
W = constant (determined in laboratory)
M_I = inches of snow (ice)
t_H = temp. hot water.
t_c = temp. of water at completion of melting - or minus of descent of column.



by the

Jug — 3# 18 oz

Sensitiveness

within 1/10 of a gram
(will weigh less than 1/2 of ounce)
friction not a factor.

1 gr = 1/30 oz.

— The Equation —

Heat gained = heat lost

heat lost = $(M_s + W)(t_H - t_c)$

[W = water equivalent of jar + thermometer]

heat gained = $(F + t_c) M_I$

t_H, t_c temp. hot + cold resp.

M_I = mass ice

M_w = " hot water

F = heat of fusion of snow
(heat necessary to melt snow regardless)
started at 0° C

$$(M_w + W)(t_H - t_c) = (F + t_c) M_I$$

$$F = \cancel{(M_w + W)\left(\frac{t_H}{t_c} - 1\right) = M}$$

$$F = \frac{M_w + W}{M_I}(t_H - t_c) - t_c$$

Saturday Feb. 27, 1943.

Thin crust in canyon above Verdi.

Dozenen clean of ice with riffles.

No divers. Overcast. Medium breakup.

Hotel

10:15 am.

Frost on sunshine recorder but mercury rose quickly when sun came out strong. Broken clouds, but stopped final below contacts when disc of sun faded.

Min. 23°F, HT 25. Sling psych. 27.2°F

Dry bulb 26°F
Wet bulb 24°F } rel. humid. —

→ Hypsograph pen does not spring back into place when it rises on the star. "It takes off but does not land" - Paget.

It has also been off the shut most of the week. Why? Have bent the pen bar, but why not have an adjustment screw as in other instruments?

Ask Jack-bars for sheets and obtain-tions if pen runs more a week. Why not use mucilage on end pivot, as on Taylor Instr. Co. thermograph, with perforations for tearing the ends apart.

The pen can pass readily over such an edge without tearing the paper. This is especially necessary where the observer does not reside at the spot or may find punctuality difficult.

Pasture

11:15 am

Dry Bulb 28°F
Wet bulb 25°F } an snow below but overcast.

Min 28° HT 28°.

For Period { Min. temp. +1.2°F - Rest 27.2°
Max. temp. 52.8°F " 28

Barometer rising slightly. Clouds disappearing. Wind 6 mi. per hour.

The Swiss Avalanche film was found too long on its single reel for George Stiles' projector. Phenol Hildegarde Berg at Reno but found that Walter was leaving Sunday morning for a coast survey trip and so could not bring his projector up.

Finally found a seam in the film and divided it into two rolls by unreeling other film into a box to get this empty reel. George was

expert with film reading and displaying at Dunsky.

3:15 pm. Gages reset or reweighed.

Sunshine recorder clean of snow crystals now and mercury column is high. at 4:30 pm column just leaving contacts the sun is still 40° above horizon.

Hotel — Snow has left edge of anemometer, but only a little this morning.

Gage No 2. Stevens W-

Contents solid. Only 0.6 in. water noticeable on measuring stick.

Guide pan off chart, which has become askew. But straightened out the sheet easily. First time this winter the line of the chart has moved.

Friction roll is O.K. Water runs when weighbeam is depressed, thus giving water an opportunity to respond to motor. Now it is locked neutral.

Oiled the clasp on the outer case. Only a tiny patch of water on the recording case.

Gage No. 3 Depth from bottom 10.4 in. = ____

Ice over all but spongy. Punctured it with redwood stick. Probably

snow would submerge ice and melt. Did not stir since it is seasoned.

Gage No. 4 Wt 16.13 in.
Ice covered the diameter of the can this morning. Now it has retracted ½ inch. Spongy but broken only into small ice pans by punching and stirring. Core 1 in. thick.

Gage No. 5 - Frig. Wt 2.03 in.

Pasture
Gage No. 6 Wt 12.77 in (1.77 in)
Surface only 11½ in. from rim. Need more room but shall wait. Learn its maximum capability & catch without loss.
Core spongy. Open all this morning. Now 3¼ in. from rim (diam. 6½ in × 1 in deep). Broken up almost completely under stirring

Gage No. 7 - Stevens Q Feb 20 - 5.1 in Feb 27 - 7.08 = 1.98
Perfect example of good trace. Frig trace also fair but more oscillation. Only tiny pumping of pan in Q. No adhesion of snow.
Bucket improper this morning.

Half pailful of snow still left.

Progress of precip.:

Feb 21-22	. . .	0.9 in.
" 23	. . .	0.02 in.
" 24-25	. . .	0.98
" 26	. . .	0.05
Total		1.95 in

Gage No. 8 Wt. 10.95 in (21.95 in)

Crust. Surface 13 1/4 in. below rim. Spongy to nearly 1/4 in. from edge. 1 in. thick. Almost completely broken up by stirring - but covered entire surface this morning.

Melting → Will one sunny day soften it?

Max. temp. for day 38.5°F; H.T 38.8°F.

Snow on boards melting and dripping.

Snow Stake . . . 80 in. Curley takes broader surface and reads it 84 in.

Gage No. 9. Wt. 14.70 in (3.70 in)

Surface 22 1/2 in. below rim (3 ft cm)

Core 6 in x 1 in depth. Spongy especially in center. Broke up by stirring except for small pieces.

Gage No. 10 Ht. 14.60 in (3.60 in)
Surface 22 in. below rim (8 pr cm)
Core 5½ x 6½ x 1 in. depth.
Breaks up by stirring but small flecs left. Pattern 9 to 11 in above snow cover.

Snow Cover

1. On the flat farm. 3:15 pm
Snow crystals are aging. 1 mm except for cohesions.
Should have a larger magnifying glass.
Observe crystals during immediate fall before loss of points.
Melting on wood. Snow on sandline wooden shelf loosened from wood has become ice beneath and is dripping.
Temp. Min 36°F, H-T 38°F. Minimum is more sensitive and acts sooner.

Pasture

2. Snow Strata of Recent Snow.
The recent (i.e. last nite's) amount 10¾ in. dep. No crust today. Soft snow 1/4 in. dep. Feathery, fruitlike. Practically no cohesion.

Feathery snow . . . 1/4 in. thick.
Crust . . . . 1/2 in. thick.
Cavities of ice crystals 1 mm frozen firmly together.
Soft snow . . . . 10 in. deep.
Extends to firm, older snow.
Total 10 3/4 in.

3. Freezing
Sunset 6:25 pm. Everybody in. Beacon Hill deserted.
Wet snow on trestle freezing.
Temp. in shelter Min. 35°F, H.T 34.5°F

Feet cold this noon and tonight. Boots and socks left damp last trip?

Sunday February 28, 1943.
9 am.
Sunshine Recorder: Light vapor, now scarcely noticeable, lies in the depression. 1/2 in. pegging on sunshine recorder. Column 1/2 in. below contacts. Sun 30° above horizon. Photo 6 ft. away.
at 9:30 a.m. Column 1/4 in. below contacts.

Feb 9 pm. Avalanche fifty above #2 crossed trail - 12 ft. deposit, taken over from Sierra Club (N.C.) Explosive tides mixed snow and attention.

12:30 p.m.

Have shellacked snow sampler and toboggan.

Have painted collar of Gage No. 3. Edges black.

Ice in Gages

No. 3. Ice covers entire bottom with ice-island in center. Edges, however, not frozen to metal.

No. 4. Contents entirely liquid. Stirred yesterday. Min. temp last night +10°F or 20°F for 5 hours.

Sunshine Recorder

Recorded at 9:55 a.m. At 12:30 p.m. recorder just at contacts." Has been recording," - Corky.

Sun's disk shows thru cirrus overcast. Warm and balmy H-T 42°F

→ Query: Should tube be at right angles to sun in winter (sun vertical) or flatter? Does flatness aid measuring column to rise?

Anemometer Dial

Watch ~~was~~ at 5.9 mi.

Wind ~~was~~ at 130 mi.

Is the reading 135.9 or 125.9?

V O 1

Read forward or backward? The mechanism should be more precise. No matter if routine is established. Carly reads ahead.

Visitors

One after the other as if in procession. I had forgotten most of the faces.

Ray K. Linsley, U.S.W.B., Sacramento.
Fred Paget and Tom ——, Clifford
Leland Smith and Wheeler, U.S.F.S.
The latter has Hodgson's place.

So spent the afternoon demonstrating the project – its good points and bads. Linsley had often planned to come as has Barnes.

Linsley is trying to improve the sunshine recorder and wind-direction circuit.

Freezing

Crust forming in pasture at 41°F.
At 6:40pm
crust is 1/10 in. thick.
Temp. Min 30°F, H.T 32°F.

Max during day 52°F caused snow surface to become moist and dry feathers to vanish. The temp. Wasn't (i.e. next morning) was +2°F.
Resulting crust 1½ in.

Linsley is readjusting sunshine recorder → to be more responsive." The right-angle to sun and weight of the column of mercury are both factors." – Linsley. If too upright, the column becomes heavier and may offset the direct rays of the sun.

A halo around the sun today. "Storm?" Linsley: "It shows a storm passing but it may be the fringe of a storm to north or south."

Weather Record from Feb. 21

Date	Max	Min	Prec.	Sunfall	Sunshine	Wind	Clouds
					Hs.		
Feb 21	52	23			75	LE	Pt Cldy
22	40	30	0.64	4	77	LNW	Cldy
23	36	18	0.21	2	79	LN	Cldy
24	43	20	0.08	1	80	LN	Cldy
25	33	17	0.78	8	88	LNW	Cldy
26	34	22	T		85	LE	Pt cldy
27	35	3	0.08	1	86	LSE	Pt cldy
28	40	8			84	LSE	Clear
March 1	52	2			82	LSE	Clr

Total 1.79 in

Hotel Precipitation

No. 1 - Standard - Unshld. 1.79 in.

No. 2 - Stevens W Trigon

No. 3 - Army Engr. Shld 10.4 = 10.05 = 0.35
Depth = 3" in.

No. 4 - Shielded 2.18

No. 5 Trig. Shld. 2.03

Pasture

No. 6 Shlded . . 2.05

No. 7 Stevens Q . . 1.98

No. 8 Unshld . . . 1.79

No. 9 Shld 2.23

No. 10 " 2.22

Monday, March 1-

The guests of yesterday, 10 student engineers from the University, and Blair Eddy and assistant gathered for the snow survey.

The crust was now 1½ in, min temp. +2° F.

A storm pit was on Gage No. 4 Blair Eddy with Fred Pagit took Summit courses while the boys from Reno visited the project and took some trial measurements on Course No. 1

3" Sta D 3-1-43

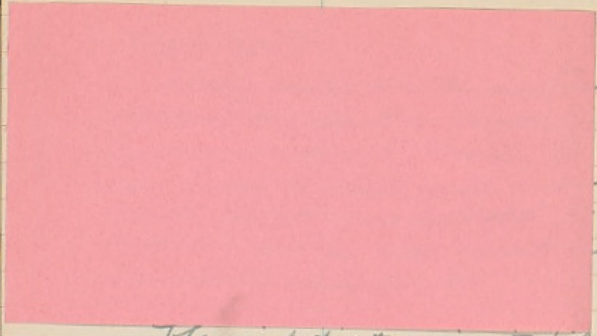
80"

-5"

79.5" depth of snow

67.8" depth core
113.0" total wt
32.0 wt sampler
31.5" water
31.5 ÷ 0.39 density
79.5

84.4 Sta 2
-1.5
82.9 depth snow
-2.8 " core
112.5 total wt
32.8 wt sampler
29.7 " water



The wind direction circuit failed to function last night but recovered at sunrise. Similar cases were found. He attributes it to cold closing the electric current of pogonip under the hood of the vane. He found pogonip crystals there but it is difficult to close the opening since the hood revolves. The battery can not be near, the temp. under the house is low enough to show one's breath.

The pad, the thing, is satisfactory for it has a metal base.

Sta. D 3-1-43

80"
-5"
79.5" depth of snow

67.8" depth core
113.5" Total wt
22.0 wt sampler
31.5" water
31.5 ÷ 0.39 density
79.5

84.4 Sta 2
- 1.5
82.9 depth snow
68.0" " core
112.5 total wt
22.8 wt sampler
27.7 " water

Triple Register

Linsley readjusted the sunshine recorder. He calls it a Chamber of Commerce instrument because it can be set to record sunshine in rain. He set it so low that it recorded sun for after sunset but immediately readjusted it.

The wind-direction circuit failed to function last night but recovered at sunrise. Similar cases were were found. He attributes it to cold laboring the electric current of pogonip under the hood of the rain. He found pogonip crystals there but it is difficult to close the opening since the hood revolves. The battery can not be near, the air temp. under the house is low enough to show one's breath.

The pak, tho thin, is satisfactory for it has a metal base.

All gathered for lunch. Linsley left early by bus 1:15 pm for Sacramento but agreed to return Friday to help with the telethermoscope.

Mann all went to sunny Canwes! and I in afternoon. I finally joined them. Later they went to Cascade Hill to ski.

~~Ski~~ Snow

Leland Smith called the wet packed snow "Chewing-gum snow" and called it very short. It packed readily in the hand. Does pressure bring up the moisture which creates a film water that adheres to ski?

The coarse "corn-snow" of spring is very wet but fast. Why?

~~Eliason~~ Motor ~~Toboggan~~

Further discussion of motor-sleds and rescue toboggans. The model of the latter was here with ~~[illegible]~~ for attachment of pole, handles at the rear for steering with foot brace and a stretcher bed.

The Edison motion picture machine.

Telethermoscope

The entire outfit was brought up this morning and worked perfectly.

The distance from the ground to the shelf is 14 ft! Fortunate that the trellis was not cut. Now we shall need more cross bars and supports.

Fire Tower

Lindley gave the Fire tower a rough shaking, seat, ladder, and top, to determine its reactions. The seat was thrown beneath the rim. The tower is very high and very loose.

Returned to Pond in last car at 4 P.M. Just before leaving George Stiles received word that the army would take possession Wednesday. I shall therefore return Thursday and write Lindley to

meet me one day early.

Need: for trellis
6 pieces 3"x7"
5 pieces [illegible] Old cables.

FEDERAL AND STATE COOPERATIVE SNOW SURVEYS

State Calif – Nev.
Drainage Basin South Yuba River
Snow Course Soda Springs Key Course
Party B. Eddy – P. Crase & Fred Paget
Date Mch 1 – '43

*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	77	67			31		
	2	74	60			32.5		
	3	69	58			32		
	4	72	67			30		
	5	81	69			34		
	6	81	73			33		
	7	77	63			31		
	8	82	64			33		
	9	81	70			34		
	10	83	73			34.5		
Average		77.7	66.4			32.5	41.8	

40 x 40 = 1600 sq ft

32.5 / 42 = 77.4 % of April 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 ____

Feb 34 in.
Mar 25 in.

meet me one day early.

Need: for trellis
6 pieces 2"x7" ▯
5 pieces [redacted] Hold cables.

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State Calif – Nev.
Drainage Basin South Yuba River
Snow Course Soda Springs Key Course
Party B. Eddy – P. Chase & Fred Poget
Date March 1 – '43

*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	77	67			31		
	2	74	60			32.5		
	3	69	58			32		
	4	72	67			30		
	5	81	69			34		
	6	81	73			33		78 x 42
	7	77	63			31		78 x 42
	8	82	64			33		
	9	81	70			34		
	10	83	73			34.5		

Feb 20 – Water Equiv. Hos 8 and 9 . . . 34 in.
Mar. 1 " " entire Course - 11 " 32.5 "

Donner Lake -

Ice covered most of Donner Lake this morning, esp Eamon, but only two large sheets of ice this late afternoon.

I feel that we are facing a larger growth of the project at Soda Springs. So nourished that I finish myself.

Thursday, March 4 -

Rain last night and morning lightly at Soda Springs. Fog visites from Verdi. Donner Lake a riffling chatter with a vapor dome.

The Hotel is lonely - Two snow-covered autos. all the help gathered in the lobby awaiting the officers to take over. Herbert and my nut-brown clerk at checking cards.

Lieutenant Grant has directed me to safeguard my equipment while furniture is being moved out.* The sergeant tells George, the chef, that I am to be given quarters.

Since it is storming, I spent much

* "Just come and go as you always have."

of the day transcribing notes until Ray K. Lindley came on the 2:30 bus.

Telethermoscope

The trellis was just tall enough but the cables would not reach when to the floor of the platform. So finally the dial box was set on the mid-braces as a compromise until additional cable could be obtained. A 12 to 14 foot cable would be sufficient for splicing if apportioned among the three.

Triple Register

A study of the records by Lindley indicates that complete failure of wind-direction circuit occurs during the latter half of the night and early morning. Can cold slow down the batteries? Water is flowing beneath the house where the batteries are situated.

Stationed the small thermograph to determine the temperature extremes.

The wind-direction fans also cease to function when the 10-mile velocity contact is on. Are the batteries weak?

usually a separate set of batteries is kept for the mid-direction circuit since it drains more heavily on the batteries. This, however, will be difficult and the extra dry cells are more susceptible to cold.

A careful test revealed the batteries at abundant strength, 3.8(?) volts. all contacts also tight.

We must now wait for more cold weather for a further test.

Snow Cover

6:46 pm. Snowing still. Snow unfrozen. Temp. H-T. 32°F; min. 31.5°F

Crystals: smallest 1 mm but becoming grains of 5 mm in size.

Try: cellulose acetate as a substitute for cellophane. It is thicker and more durable. But can it be heat and made watertight at the seams? It will not shrink.

Approx. 6 pm
H-T. 32°F; min. 31°F
at surface of snow
slightly covered 0°C
4 in below . . . 0°C

During night - Min. only 34°F; HT steady at 32°F

Snow on surface moist but with depth tends to congeal.

Exception? Snow crusts in clear weather and even cloudy at 35°F to 41°F, if moisture is not excessive.

But if snow is wet as by rain or air is charged with moisture, the crust does not form at 32°F on the surface or 32°F in the air above. The reason seems to be the slowing-up of radiation as in the case of a water pool or mud.

Crystal Growth

The crystals with depth are coarse. Basic crystals are 1 mm but clumps are even 5 mm.

→ Query: Do these clumps finally form into single crystals? And take the traces of their origin from tiny crystals? Thence can start — as in Nugssuak?

Record of the Weather

Date	Max	Min	Prec.	Snowfall	Snow on Gd	Wind	Clouds
Mar. 1	52	2			82	LSE	Clr
2	47	13			80	LSE	Clr
3	48	20			79	LSE	Pt cldy
4	41	24	0.34	2	80	LW	Cldy
5	39	25	0.54	1	78	LNW	Cldy
6	40	29	0.39	3	79	LW	Cldy

Precip. Mch 4-5 in Storm Q is 0.95 in.

Training School for Hydrologists

Linsley has a plan for an experimental and training station for hydrologists. The rating of hydrologists in the Bureau is not high and trained hydrologists are being transferred to other departments or are resigning.

Lindquist, Wilson, Snider of Harrisburg, Pa, are gone. The Army Engineers are reaping in, but the Soil Conservation Service is being forced by war to transfer some of its instruments to the Weather Bureau.

Wapora Ranch very little because Cook was sent down to construct Soda Springs Station. Told that it was a repetition on Barnes and Linsley. Yet it is agreed that Cook is the best in the Western station for such a task.

Barnes was not called personally from Chicago to San Francisco. Major Davis merely asked for the oldest engineer in the service and the best. His experience had been gained only in the mid-West where rain is more dominant than snow in stream flow. Rupp is missed.

Friday, March 5

A change in commanders and orders. "all civilians out". Major Cassidy has been transferred. Lieutenant Peart says to stick around while he goes to Auburn for consultation.

10 a.m. Barometer is rising strongly. Wind NW. Sun nearly there. Snowing. Wet.

Temperature in Snow.

10:15 a.m. H-T. 34°F; min. 33°F.
1 in. beneath snow +0.2°C
4 in. beneath snow 0°C

4 p.m. Snowflakes 1 mm in clusters of 4 to 6 flakes. The stars melt immediately resulting in tiny vessels of ice, then in drops of water.
H-T. 35°F; min. 34°F
Just beneath snow surface 1°C
4 in " " " 0°C

3 photos of interior of gage, ladder, and overview all taken at Soda Springs to photo archives

Telethermoscope

Photographs taken; thermometer bulb filled in.

Temp. 1 ft up. . . . 39°F
2 ft up . . . 33°F
3 ft up . . . 33°F

Why 39°F at 1 foot? Too warm.

Measured for telethermoscope at trestle in pasture.

15 cables:

15 ft long for rail
14 ft for 1 ft. above ground
13 ft " 2 ft " "
12 ft " 3 ft " "
2 ft " check on instrument.

Want only toggle switches.

Register must be returned for adjustment and proper wiring.

Write Lemmon for permission

Leases

Letter from W. L. Hack, Supt. Southern Pac. March 3, 1943 - Refer L - Soda Springs.

Lease audit No. 73737

Expires June 30, 1943.

Please advise S.P. Sacramento if lease is to be extended.

Issue letter to Lindley to send in with

his report and will write a supplemental letter to the railroad.

Dennis Jones tells us that the pasture lot belongs to him. His mother had given us permission to use it. He suggests a formal lease with permission to fence the trestle if we prefer. He would like some compensation or rental also if we are willing.

To the latter I agreed readily as I had to rental for the table space for the triple register. Lastly felt that the Weather Bureau had no means to pay it but I was certain that the Experiment Station would carry the expense.

No suggestion of amount. $5.00 per month should be maximum. Perhaps $25.00 a year would be agreeable.

Authority

Lieutenant Benson came this morning to take charge of the Hotel in the absence of Lieutenant Peart. He explained that rules were against the permitting of civilians in army

camps and that explanations would be requested from over-higher officials until it would be ending. Last winter during the storm he gave mothers and children from stranded autos shelter at Vandenford, willing to risk his position for humaneness. But these cases are emergency.

Uncertainty

Last night Lieutenant Grant declared that he would deprive no woman of her home and that Mrs. Jones could retain the post office. But Mrs. Jones said that they did not care to stay.

Tonight the Army Engineer and Lieutenant Benson decided to turn all buildings over, the third floor of the Hotel could be retained for storage.

The triple register is therefore in danger of abandonment for Lieutenant Grant has said that the police all had their daily tours of 8-hours and could assume no other duties.

Early taken of going to Gunbarrel Inn. Can we obtain gasoline for him and extra wages for the 18 miles round trip daily? Lieutenant Benson says that he would be permitted access.

Lindley is worried and desires to set up to get the final decision when Lieutenant Grant arrives from Auburn. But at 11 pm we go to bed to talk and finally to broken sleep.

He felt that any temporarily abandoned instruments like the triple register should be returned for use in one of the many new offices being opened but I feared that it would not be returned when we needed it. In any case, we would seek every means of keeping the project alive and buy it only when we were certain that it was dead.

Saturday, March 6.

Our last breakfast and meal cooked by George Stiles.

Lieutenant Grant came with the morning and gently told us that he was sorry: that space was limited, and that alterations might take a month. That it would be desirable for us to live elsewhere, especially since Mrs. and Miss Mears were staying. But we could keep the equipment at the Hotel and work here under the supervision of a sentry. This was fully satisfactory

for the sergeant(?) in charge of the furnace and carpentershop had been kind.

We would take the chance of a shot from a nervous sentinal if we moved at night. A sergeant advised carrying a letter of authorization and approaching the entry first.

I was instructed to cover the equipment with our tarpaulins to guard against confusion of property and the Army would see that it was not molested. Dennis Jones suggested that I mark it "Property of the University of Nevada" for identification.

Lieutenant Priest readily assented to my suggestion that I obtain authority from higher-up, as from Colonel Robinson or the Quartermaster General. This will give stability against the frequent change in authority.

Anemometer, etc

Was taken apart and cleaned and oiled by Linsley. Should be recited monthly.

Nothing can be done to increase refinement in dial for the mechanism is normally loose. Obtain the nearest reading even by waiting or observe the reading from the triple register record.

No lapse of record by wind-direction a new felt pad was brought up by [illegible] but is not yet needed. The tension has also been slightly relaxed.

→ The thermograph will be left in the basement for a time. The roll of record sheets for it has been found.

Lost Shield

The lost passage from Redding is a bunch of slats much warped and without box. They had been thrown out and the award by the boxer who brought them over from Auburn for the truck line.

But only a single leg for the gage basket was missing. The slats were put in order by rebinding them on the ring-rods

Resetting Instruments

Lindley did the work to become familiar with the routine.

Hotel -

10:18 am

Dry bulb	34°F
Wet bulb	32.8°F
Min. therm.	33°F

Pasture

11:25 am.

H-T.	35°F
Min	34.6°F

Canvas

Dry bulb	34.0°F
Wet bulb	33.0°F

Temp. for period 50°F max. } Reset 35°F
+1.9°F Min. } " 34.7°F

Precipitation Gages

No 2. Stevens W.

→ Liquid in container with ice island approx. ½ diameter. Oval in shape. Evidently the temperature has overcome the thermostatic effect. Heat at run melted accumulated

→ snow in approx. ½ hour. The battery still seems to be operating. Since the season is moderating

and little heat will now be necessary to keep the rim clear of snow, it may be well to leave the circuit as it is and not remove the resistance coil.

No. 3. Army Engineers

Held snow on catch rim which was not shaken off loose except by violent agitation of the collar which probably could not be effected by wind alone. Snow wet and cohered to rim.

When snow falls into gage, it becomes slush submerged in oil.

No. 8. Standard Inclalded Gage in Pasture.

Slush in the oil. Snow is building up on box support. Such supports are used in the Valley where rain predominates. Dangerous to records here.

→ NB. - All pasture gages contain slush in oil. Tube and those else at Hotel will be left unstirred for a week to observe results.

The slush is evidently snow flakes

recently fallen and now transformed to ice-crystals in the air and water. Or is it calcium chloride? More probably the calcium has settled, leaving water alone. Enquire of the chemists.

No. 7. Stevens Q will pass the end of the sheet. Since the ink and storage-space are abundant, the gage will be left for longer test. When precipitation does not exceed capacity, the sheet can carry the records, for there is no reserve. Not certain, however, regarding the distance of the clock-weight above the ground.

By double revolution and pulleys, the Stevens Q can readily be made into a 3-months gage. The ink is now already in its fourth month.

Telethermoscope

Second Test: approx. 10:45 pm.

Switch No. 1 { Thermom. in telethermog. shelter 36°F
Check thermal unit . . . 36°F

" No. 2 (top) 3 feet from bottom . . . . 33°F

" No. 3 2 feet from bottom . . . . 33°F

" No. 4* 1 foot from bottom . . . 36.5

The number 4 unit seems to be erratic and will balance at almost any temperature from 36°F to 46°F if retested at short intervals

Temp. in snow by enclosed thermometers:
In new snow at 3 in. below surface 0.2°C
at 6 in. depth . . . . . 0.3°C

* Next visit two checks of No. 4 will be made:
1. Sink a mercurial thermom. in snow to obtain parallel readings.
2. Excavate No. 4 and immerse unit in cup of water with mercurial therm. to see if they correspond in record. It is possible that water has entered the case of No 4 but why is it shifting?
3. Changing circuits might reveal a defect in the mechanism but this seems unlikely.

Snow Texture

The new snow is soft to tread on, but the older snow yields and kneads like putty - just warm enough (ave. 0.2°C and 0.3°C) to be moist without being wet.

Classification of Snow

Linsley suggests that textures be recorded not only of the snow surface but also at depth — 1, 2, or 3 feet or more as desired. Lindquist's idea is good and can readily be inaugurated and extended.

A Series of Storms

March 5, the barometer was rising; March 6 it remained steady. But fog, almost
rain, and snow continued — 1/2 inch precip. daily.

Returned west and east in early afternoon of March 6 - found the clouds limited to the mountain tops of main and Carson Ranges. Sunday Semi-clear at Reno.

Sunday, March 7 some clouds persisted on mountains but thickened by March 8 with heavy persistent rain of approx. 1½ inches at Reno that night and March 9.

* Reported only fog at Donner Summit but rain at Blue Canyon and Reno, Lava Beds precip. rather than fog, during night, remnant of the round trip storm

It has persisted into March 10 but is now clearing the fog, rain and snow lasted most of the day at Donner Summit. Plans

Wrote Curley yesterday that I would wait until storm was over. Now I shall go tomorrow to reset all instruments or reweigh them. Some can still hold greater loads and the action of Calcium Chloride under increasing dilution in warmer weather should be studied.

Thermometers

Have turned back to Dept of Physics all three C. thermometers and received two F sealed. Thursday can have four more. A half-dozen are still due and one special for greater extremes. The former have a range of +10 to +240°F but can be read to 0°F. Bridges are being placed at 40° and one at 45°, and a third at 50°F to read temperatures at the surface of the snow.

Latent Heat of Melting

The weight necessary to change grams to ounces or water inches will be approx. one pound. To provide room, this must have like a plumb-bob from a ~~long~~ slender stem that can be slid along the weight-arm. Since 1 oz = 30 grams

Equations for Determining W

$$(W + M_H)(t_H - t_F) = (80 + t_F) M_I$$

$$W = \left(\frac{80 + t_F}{t_H - t_F} \right) \cdot M_I - M_H$$

and whole grams are used in the equation, the equivalent unit must be 1/30 oz. or 1/3 of the tenths into which the gram division is subdivided. Rather fine but no worse than reading 1/10 of a degree F.

The factor W.

Spent the afternoon determining the influence of the glass thermal-jug on the temperature of the water.

Wt of thermos-jug 1433 grams = approx. 3 lbs

Fixed factor W

1st test 78 grams
2nd test 65 "
av. 71.5 "

Factor W 70 may be better as round no.

Error of 6.5 grams ice probably to method of shaving and manipulating. = 1.3 calories. Error only slight for temp. during test fell only 4°C in 3/4 hour. "Effective insulation."

Equations for Melting Dry Snow below 0°C. can be computed.

80* + 1/2 (°C below 0°C)

* Calories per gram. 80 is figure for pure ice.

Thus no need to weighing except when snow is wet and at 0°C or higher. Should specialize on

various types of slush.
But I'd like to try the dry and cold.

Weights of Snow and Water

Water will melt its own weight of ice (170.6°F) or dry snow at 80°C (176°F). at 77°C melts 1/4 its weight of ice.
Drop in temp. would be much lower.
at 1/4 droffel from 77°C to 47.4°C.

Need:

1. Electric plate with 10 ft cord - to heat water to study latent heat of melting.
2. Balances
3. Velsfar varnish for thermos-jug to withstand heat on waterproofing.
4. Field anemometer.
   (a) To compare wind movement in pasture with that at Hotel.
   (b) To determine loss of movement in anemometer because of wear in cups.

Interim - March 6 — 10.

Series of storms on rising barometer.

Night of Feb 10:

"Front off east side of Sierra. Unstable air. Cumulus clouds at Donner Summit, with occasional lightning. But high pressure moving in from Coast" U.S. W. B.

Trip Thurs-Fri, March 11-12

Muddy water in Truckee River only below Floriston. Storm above this point was snow.

Fog from throat above Floriston to Summit. Snowplow has been along road. Water in river plentiful but greenish.

At Summit fog is 30 ft high with trees in snow. Fog reaches in long tongue to Sugar Bowl. Forests at higher level are snowclad and in brilliant sunshine.

No snow on road but some ice at Norden.

Soda Springs

George Stiles and Elisha still here and Herb and Allie at Beacon Hill to try it out.

Lights and heat off. Storm of yesterday broke down the wires.

Light. Comes(?) gave me a Aluminum lamp and a lantern to use in the shop. But at 11 a.m. the lights have come on.

Snow slides —

— Wet heavy snow — on sunny slopes of Castle Peak and beyond Beacon Hill.

Snow Hoods

Yesterday rain and snow. Wet snow covered the gages like a hood to heights of 6–8 inches. Curley trimmed the snow to edge of cans and snow fell in with a splash. A plain case of bridging — he had never seen anything like it before.

Fortunately he did not touch the Cans in the Pasture. I want to see how nature handled the problem. Sorry now that I did not go up Wednesday as planned. The flakes must have been large and probably broke the wires. "A milder degree of temp. rise and rain would have resulted". As it was, precip. 2.03" and snow 13 in. = 15% density. Sweet snared.

Triple Register

The set screw of wind direction was loosened too much by Linsley. Right-hand pen snagged pad and stopped the entire four pens from acting. Directed him to tighten the tension as formerly.

Temp. in basement at battery March 5–10 was 36°F to 35°F. Min. in outer air was 31°F to 20°F. Reset thermog. for another week.

Photo of gauge "pegging" in photo archives

Sunshine Recorder

Sunshine recorder started ending at 9:56 am at 6:45 pm just as sun finally disappears, mercury is 1/4 in. below contacts.

Anemometer

Glass of the dial wet - so wet that dial could not be read. Had been so for some(?) days. Found water inside.

Turned collar upside down to put tiny vent hole below and name-plate above. Water may have entered → thru hole. Watch this.

Telethermoscope

No. 1 -	Check	48° F. -	Exact.
2	- -	33°	
3	- -	30°	
4	. .	35.6°, 34.6°, 34.0°	
No. 1		53.1°; Thermom.	51.1°
		52.0°	50.0°
2		33.0°	
3		33.0	

Thermoms. in case

2 ft above ground 32.2° F

1 ft " " 31.8° F

No. 1 . . 53.0°F ; ~~thermom.~~ 51°F
47.3°F ; 45°F

Nos 2 and 3 . . 38°F

No. 4 34.1 ; 36.6 ?

→ Dry early morning

March 11

~~Snow~~ Crusts

Hotel 4 pm
Wind 43.5°F ; H-T 46°F
Ice beneath snow on platform ~~laying~~.
Snow in shade below on ground beginning to crust.

Pasture 6:30 pm
No melting - but dry frost on crust. ½ in thick. Beneath ice crust ½ in in last one.
However, snowshoe tracks are crisp as deep as they are broken - 3 in. deep.
→ Melting by compression?

Hotel 6:45 pm
Temp. Wind. 35°F ; HT 37°F

Weather Record - March 5-12.

Date March	Max.	Min.	Prec.	Sfall	Snow on Gd	Wind	Clds
5	39	25	0.54	1	78	LNW	Cldy
6	40	29	0.39	3	79	LW	Cldy
7	36	22	0.19	2	78	LNW	Cldy
8	45	28	0.56	3	79	LNW	Cldy
9	39	31	1.90	6	85	LNW	Cldy
10	40	30	2.03	13*	96	L Var.**	Cldy
11	41	20	0.11		91***	LNW	Pt cldy
12	48	21			86	LSE.	Clr

Total (incl. 0.34 in. Mch 4) 6.06 in.

* Farmers heads on gages.

→ ** V where used = "Variable". In copying, V was misunderstood as N and thus transcribed. Recheck the record and make necessary corrections in copy in these reports.

*** Snowstake 6 pm - Mch 11 . . . 86 in. as read by J.S.C. Carley judges the wider contour of the crust instead of the narrower at the snowstake.

* No 1 hollow below. Snow did not build up from below but bridged over without support. Curley never saw anything like it before in his life.

This must be the reason for the pipes bursting. No frost, at least none this morning (March 11). and yesterday min. temp. was 30°F. So merely superficial snow.

Snow caught on trees higher up — at 6,500 ft. on Crystal Peak at Sandia and 7,000 ft. at Soda Springs.

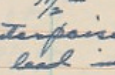
Precipitation Gages

Feb 28 - March 11 -

12:30 p.m.

No. 1 (March 4 - 11) . . . 6.06 in. *

No. 2 Stevens R. Depth 12.28 in. from bottom.
See Stevens estimate
Slush or soft ice over approx. half of center. Melted on margins.
Weighbar 1.5 in wide and flange 1/5 in. thick.



Make a counterpoise weight as heavy as the lead in cloth sack to hang to bottom, thus

This will enable the removal of the entire weighbeam.

→ Why not make this a permanent feature in order to reset the gage in midwinter when its original capacity has been attained?

Patches of water 8 x 2 x 1/10 in. over cover of recording cases and on ledge inside of door.

Dilution

* No. 4 Can too full for capacity of balance. So divided contents.

All on liquid. Below clear water (?) and calcium drops at bottom. Water almost tasteless. Has calcium separated out? At least great dilution.

No. 3. Army Engineers Depth 12.1 in. above bottom. 12.1 in − 10.4 in = 1.7 in = 7.3 approx. in. precip.

Pan of ice covering entire bottom but loose. Punctured it with redwood stick.

2:30 pm.

No. 4 Height within 1 7/8 in. of rim. Fully melted.

Height (too heavy for max. of scale. So divided *)

(a) Wt 10 (21) in. = 4.87 in. precip.

(b) 17.75
19.74
1.99 in = 1.99 in.

Total 6.86 in.

Recharge Wt (2 cartons) 15.1 (4.1) in.

No. 5 - Trace Feb 27 - Mch 8 2.78 in. } 7.03 in.
Mch. 11, only fog, no snow Mch 8 - 10 4.25 in }

Tower much stiffer now and vibration of trace seems much less.

→ Study wind.

On March 11, observer trimmed snow hood to permit core to drop in. Splash accretion 0.50 in. Also on Stevens Q (No. 7) the splash accretion was the same amount, despite the fact that the hood

was melted only by the sun. But cold (ie. freezing) or wind might have clogged the orifices or blown the snow away. This at most would have been only one-half inch.

In Pasture

No. 6 Surface 5½ in. below rim
Wt 19.67 in (8.67 in) = 6.90 in. prec.

Recharge 14.925 in.

No. 7 - Stevens Q (Dec. 12). Record 6.65 in.

Surface 5½ in from rim of bucket and 3½ in. from top of outlet.
Reset 1.73 in.

→ Should be allowed to become no heavier without handles but it could hold more and the instrument could run far longer with present ink if sheet can be doubly traced.

Query: What is the max. drop of the clock-weight monthly? Present potential drop is 10 ft.

→ a drop of water at the outlet siphon yesterday may have resulted from the splash of snow. Should have [illegible]

* Removed Mch 11. No stirring or ink.
Precip since Mch 3:
Begin. Mch 3 noon . . . 7.16 in.
" 6 " 8.50 in
" 11, 5:30pm . . 13.67 in.
6.57 in.

9 am. Mch 10. Snow core fell in. Approx. 9.45 in

Strains on cable

(8) Has strain become greater?

a receptacle at bottom of siphon to catch overflow. See Note on No. 5.

No increase in ink. Another month around. *↑ 2 cartons only; 1 also for all other gages except No 1 (none) and No. 5 (one).

Hot today on foot and raincoat.

No. 8. (unshielded) Surface 6 3/4 below rim.
Wt 17.42 (6.42) in. = 6.47 in. precip.
Recharge 14.955 in (3.955 in)

No. 9 (Mch 12) Surface 14 1/2 in. below rim.
Contents divided
(a) 16.045 (5.045) in. = 1.345 in
(b) 10.08 (21.08) in.
16.20 (5.20) in. } = 6.12
Wt
7.465 in. precip.

Recharge 3.98 (14.98) in.

No. 10. Contents 15 in. below rim.
Partial wt. 14.85 (3.85) in = 0.25 in
Bal. 4:13 (15.13) in.
11:245 (0.245) in
Add. 7.115 in. = 7.115
Final Wt 7.365

No. 10 (cont.)

Recharged 4.27 (15.27) in.

Freezing of Contents

Nos. 4, 6, 7, 8, 9, 10 entirely unfrozen today. It is still down only 24°F last night but No. 2 (W) and No 3 (Army Engr.) is frozen entirely over. Ice not thick. Water left unturned yesterday.

Enough load

Name the tall cans Nos 9 and 10 and the high snow. Too much digging to excavate a neigh pit and too heavy a load to handle in soft snow. The tall heavy cans in soft yielding snow drives the observer off his pegs and smears bottom of can with snow. The balance → also lacks capacity. Therefore I vote for taller towers and more capacious balance.

Query: Mushroom snow on prominences yesterday — was it a remnant of the last snow that hooded the gages Wednesday?

Do: Write or wire Quartermaster General or Colonel Reuben Robinson re cooperation at Soda Springs. Permanency essential.

* Sunshine Recorder
at 40°, sun in cirrus, Mera. column still 1/4 in. from contacts. Shadows are black.
at 50° (10 a.m.) above horizon, sunshine column just reaching contacts.

Comparison of Gages and Snow Accum.
March 1–12.

Hotel
No. 1 (unshielded) . . 6.06 in.
No. 2 Stevens W · Depth 12.28 in.
No. 3 . . . . . 7.30 in app.
No. 4 . . . . . 6.86 in
No. 5 Friez . . . . 7.03 in

Pasture
No. 6 . . . . . 6.90 in
No. 7 Stevens Q . . . 6.65 in
No. 8 (unshielded) . . . 6.47 in
No. 9 Near snow . . . 7.465 in
No. 10 " " . . . 7.365 in

Snow Course Nos. 8+9. Mch 1 · 33.5 in; Mch 12 · 38.5 . . 5.00 in

Snow Stevens Mch 1 . . 82 in; Mch 12 . . 86 in = 4 in. depth.

Friday, March 12

Sunshine Recorder

Sun 2.5° above horizon and mercury still ½ in. below contacts. Clear. Sun above all cirrus.

Wind died not again. Must let it dry out. Rain not much for it?

Tiny vent * should be at top or bottom? Left it open in sun and wiped it thinly.

Tele-thermoscope

morning:

No. 1 Check. Tele. 28°F; therm. 28.4°F

" 2 33°F; therm. in snow 31.8°F

" 3 33°F

" 4 39.6; therm. in snow 32.1°F

Min. for night 22°F

evening (4:30 p.m.):

No. 1 Check. Tele. 60°F; therm. 57.8°F

" 2 . . . 33°F

" 3 . . . 33°F

" 4 . . . 35.7°F.

Snow frozen at surface. Will take the long to dig units out before train, due in 25 min.

Photo of snow sliding off roof at Soda Springs
to photo archives

Triple Register

Wind direction still failing at night and clicks-clicks (twice instead of once) at each contact.

Crust

Crust very solid at only 24°F min.
2:15 pm Min 51°F; HT 52°F (max. today 54°F)
Crust hard this morning. Could walk practically anywhere on it. Now frequently break thru.

Snow has melted 2½ in. Last night's crust 5½ in. Now can be passed by hand — wet.

Snow below crust is coarse and moist but squeezes out of the hand rather than packs.

Surface snow where trod much by skiers is again like putty.

→ Tomorrow's crust must be deeper than 5½ in (?). Will moist coarse crystals cohere at moderate temp. such as 24°F last night?

Glare ice: Ski tracks and toboggan trail glisten like silver. Melting from compression and refreezing into a film of ice like window glass but very thin.

Snow Sampling and Melting

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State California
Drainage Basin S. Yuba
Snow Course Soda Springs No. 1
Party
Date Friday, March 12/43

*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
No 1	8	86 −1	75.8 −1	82.2	118	35.8		Dirt at bottom of core. Snow slightly moist
"	8a	85.8 −1.3	71.5 −1.3	82.6	120	37.4		Water down to ground but no soil
***	Core	1½ in. wet ice at bottom 1 1/4 in. almost saturated. Snow wet and coarse but does not pack much.						Coarse
No 1	9**	82 −.3	65.5 −.3	82.6	117.8	35.2		Ground wet but still frozen.
"	9a**	83.8 −.3	68.8 −.3	82.6	122.2	39.6		Ground wet
Snow stakes 84 in.								

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

36211 8-38 12,500

Snow Sampling and Melting

* Bottom snow coarse. Larger crystals. Congeals slightly.
Toward surface still coarse and pacts slightly after much squeezing and loss from hand.
1st below surface some congealing. From yesterday's cold.
→ General moistness due to recent storm and rain?
Study growth of crystals.

** Suspended water 1/2 inch. Snow coarse and wet but crushes and separates under pressure.
Lower snow all wet and crushes.
Nearer surface snow congeals. Is still slightly frozen (afternoon; after 3:15 pm).
On top snow packs readily. Not as coarse. Ground is wet.

Hygro-Thermographs

Hotel

11:10 a.m.

Dry bulb 48°F
Wet " 36°F

Pasture

12:15 p.m. HT 48.5°F

Dry bulb 48.2°F } In shade on snow
Wet " 36.8°F }

12:27 p.m. Min. 50.7°F; HT 49°F

For period { Min 20°F - Reset 51.2°F
Max 52.6°F Reset 52°F

a few cumulus clouds today against a background of feathery cirro-stratus. airplanes drone overhead.

Face and head ache from brilliant sun. Only 54°F max but snow in pasture is pure white.

Photographed ladder and braces on fire tower.

Need photo of drift-snow gages.

Must test telethermo. in water

Ladder + furnace are Fog Town

all baggage except one [illegible]
Two locks and light by.

Saw another section of 13 cars. Soldiers in single file back and forth. To dining car? Train all soldiers except [illegible] civilians.

My first time down thru tunnel — long, cool, fast. But can see Donner Lake.

Cold Stream very long and empties far below feet of Donner Lake into Donner Creek? In and out in Cold Creek many snow-slides on northeast face.

Mount Rose one white outline. No windows on face. All white Lake Castle Pass from Pasture in whiteness.

Truckee 6 pm. So comfortable & the early.

Train Home

Herr Laalander and companion have made the 1st ascent of Eagle Bank today. She in red plaid kilts like a Highland Lassie. Flesh nearly the color of the kilts. A long trip and much climbing.

Caught railway train at 5:10 pm. On time. First section approx. 10 cars, all baggage except one coach for crew. Two toots and right by.

Soon another section of 13 cars. Soldiers in single file back and forth. To dining car? Train all soldiers except sprinkling of civilians.

My first time down thru tunnel — long, cool, fast. But can see Donner Lake.

Cold Stream very long and empties far below feet of Donner Lake into Donner Creek. In one spot in Cold Creek many snow-slides on northeast face.

Mount Rose one white outline. No windows yet face. All white like Castle Peak from Pasture in whiteness.

Truckee 6 pm. So comfortable & the early.