STENOGRAPHIC NOTES

"Dye in Winter and on Soft Snow"

No. 18

From Sunday, December 3 1944

To Thursday, January 11 1945

No. 26-G

Weather Record for December

	Max	Min	Precip.	Snowfall	Snow on Ground	Wind	Clouds
Dec. 1	34	26	1.38	11	42	NW	Storming
			7 pm Nov 30 to present				
			#1 646				
			2 671				
Pasture							
for Period (11:50 am)							
			Max. 50.2° F	Reset 31° F			
			Min. 7.5°	" 30°			
" 2	34	22	0.26	3	44	NW	PC cldy
			Ended 9 pm Dec. 1				
			#1 706		Streams S - 0.15 in.		
			2 735				
" 3	32	8			42	SE	clr
			#1 875				
			2 920				
" 4	43	21			38	SE	clr
			#1 30				
			2 135				
" 5	52	13			37	SE	clr
			#1 120				
			#2 197				

Dec. 6 57 7 36 SE clr
#1 194
2 244

" 7 56 8 36 SE clr
#1 260
2 290

" 8 55 10 35 SE clr
#1 367
2 360

Pasture Period Max 56°F Rest 44°
Min 3 " 43°

" 9 49 23 35 SE clr
#1 475
2 472

" 10 53 6 34 SE clr
#1 550
2 524

" 11 41 11 34 SE clr
#1 647
2 605

Dec. 12 43 24 33 SE clr
#1 802
2 754

" 13 47 21 33 SE clr
#1 902
2 842

" 14 43 21 33 SE Pt cldy
#1 0
2 900

" 15 54 15 33 SE clr
#1 60
2 965

Pasture
Period Max. 59°F Reset 50°
Min. 2°F " 49°

" 16 52 10 33 SE clr
#1 132
2 40

" 17 45 11 32 SE clr
#1 207
2 107

Dec. 18 43 20 T 32 SE Cldy
Jam. light showers
#1 258
2 154

" 19 42 32 1.30 30 E Stormy
#1 297
2 200

" 20 48 33 1.02 28 SE Pt cldy
Ended 6pm
#1 392
2 318

" 21 43 28 0.35 26 SE Stormy
Began DN Ended 10am
Rain
#1 430
2 358

" 22 40 32 1.44 3 28 NW Stormy
Began DN — During Night
Snow
#1 500
2 452

Pasture Max. 50°F Reset 36°
Min. 5°F " 34°

Dec. 23 44 32 0.28 1 29 SE clr
Ended DN

#1 513
2 468

" 24 41 14 29 SE clr

#1 571
2 522

" 25 45 9 29 SE clr

#1 635
2 566

" 26 48 7 29 SE clr

#1 677
2 616

MODEL NO
52RGES 2E
SERIA NO
10901

" 27 33 19 29 SE cldy
Began 6pm

#1 750
2 700

Dec. 28 30 20 0.90 12 38 NW Snowing
#1 885
2 855

" 29 27 19 0.22 4 42 NW Stormy
Ended DN
#1 0
2 932

*

" 30 35 0 0.36 6 47 SE cl
#1 40
2 976

" 31 41 −1 45 SE cl
#1 105
2 40

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* Pasture Dec. 29
Max. 42.6°F Reset 26°
Min. 5.2°F " 24.4°
Roof of therm. shelter leaks.

Sunday, December 3

Usual wind after a storm -
E wind and swirling snow from
trees and dam. Snow shoe prints
fill rapidly.

Out at 10 a.m. Sleeping 12 hours.
Lumber stored in tin garage.

Crust
Ambient
(a) Fresh Sno-Go 3½ in.
(b) Untouched snow: Still only ¼ in.
Min. temp. 8°F

N. side of Road
Tilting toward sun. Sno-Go snow 3¼ in.

S. side of Road. Flat. Sno-Go 1⅛ in.
" " " Sloping NW " ¾ in.

In Vertical Cut by Sno-Go, ~~No~~ In shade 5/8 in.

Temp. 11:30 a.m. 25°F; H-T 26°F
Min 8°; H-T 9°F

Melting Dye at room - Turning red on red snow.
Dye at 5 p.m. 2 in. deep.
Temp. for day in shade 30-32°

Note - The melter the dye, the redder it turns.
Dye shavers coarse enough.

Gages

Cleared Platform at Hotel.

12 Noon

Hotel Stevens S 16.30, later 16.25 = 0.15

Ice, with snow in center

cut pins from inside of handle

scratch side of cam.

Ashton Codd and Service Man arrive. with beaver-board, pegs, and slabs. Full load.

Two Sno-Cats also here.

"No snow too deep

No slope too steep"

Took Service Man to lunch, loaned him boots, and sent him to ride with Sno-Cat. 37 yrs old, from South, at Auburn.

"The youngs at Bijou will care for weather station there".

Taneus shipped. Should be at Las Vegas next Thursday.

Phoned to Eddys at Calfax to come over tomorrow. Jack should ride on Sno-Cat. Blair will help me

set the stakes.

No. 2 Stevens W.

Snow clear from top of cone and retracting over door. But still built up above railing on west.

Snow on cone facing sun slightly moist on gray-painted metal. Temp. in shade 30° F

Ice on wood (even-level and white) is quite wet in the sun.

Cleared door of snow before lunch. all dry after lunch.

Motor started! Quite audible. "Let it run out." No, it is reversing! The trip-weight has fallen!

→ Was jarred loose by chopping ice with shovel blade. Must make hook resistant to all but thrust.

Reset. Now motor is advancing to balance the loss: loss was 0.45" precip. but in recovery gen regained only 0.25", Net loss in seasonal record is therefore 0.20".

Bit steps of graph are very broad—
even 0.65 in. and 1.45 in. precip. Only
one was 0.05 in.

W. 7.85 in. (Max. progress open since
setting Nov. 8 . . . 8.05 in.)
D. 7.8 in (NW side) To liquid 60.1 in.
Liquid unfrozen.

No 3. Army Engineers
D. 16.1 in To liquid 43.4 in
Sudsy

No. 4 ~~W~~ 12.97 Top of liquid frozen.

Reducing Top.
D. 11.8 in To liquid 29.0 in.
Slush or frazil
Wind shield not hooked below.

Stevens S.
Reweighed 16.25 in

Pasture
4:15 pm.

No. 6 W. 12.43 Ice

No. 7 W. 15.55 (or 15.65 [?])
Slush-ice

Snow Stake 42 in.
Anemom. 920 mi.

No. 8 W. 10.74 Ice and tiny fine of snow on top.
Snow collar on E, N, W sides of box above molding. Height 5-7½ in. or 1 in. below orifice.

No. 9 W. 16.55 in. Ice. floating ½ in. Clear of wall or a total of 1 in. But rises above liquid. So stick meas. would be inaccurate.

No. 10 W. 16.90 in. Ice.
Reserve of approx 22 in. above liquid. Prob. true also of No. 9

Notes on Stevens gage Nov. 26 in folder

Stick Measurement

Stick measurement seems possible in winter only in larger gages where charge of calcium chloride is heavy.

Fails in 3 ft. and 2 ft. cans. Must have heavier charge there also to keep warm short time catch liquid.

Query! What is present dilution?

H-T°.

Six of Temp. jars bath failed today. Reinked them. Yet they seemed flooded.

Monday, Dec. 4

10:30 a.m. Blair Eddy and "Newt." (Arthur) Chase arrived.

Had a ride on Sno-Cat. Impressed with its speed but drenched with snow.

Donner Summit - No. 1

To Summit No. 1 via Kiski Lodge and down steep hillside

thru tiny doors in snowshed to old concrete Summit Station. Old home to me where I made my first snow surveys in the Yuba.

Course No. 1 is in valley SE of Summit Station, my No. 2.

Course 50 ft from tree with snow marker every 25 feet for 14 meas. to 156 ft. from right (i.e. W) of two (twin) trees. Survey made.

Leaf frost on snow at one point. Trees snow-laden.

Dyes:

1. 25 ft west and at right angles of No. 4 meas. Marked by stick. Black and Fuchsine. Nearly in line with iron pipe projecting above the snow.

2. 35 ft west but at angle uphill from No. 1 meas., behind clump of fir.

FORM 130

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES
401 PUBLIC WORKS BUILDING
SACRAMENTO

CALIFORNIA COOPERATIVE SNOW SURVEYS
SNOW SURVEY NOTES

Drainage Basin South Yuba River

Snow Course Summit No. 1

Party B. Eddy and (Newton) Arthur Chase & J. E. Church

Date Dec. 4, 1944

*Description or Number of Course (1)	Sample Number (2)	§Distance Between Samples (3)	Depth of Snow Inches (4)	Length of Core Inches (5)	Water Content Inches (6)	Density 100 x (6)/(4) (7)	Remarks
		—					
Key	1	25'	40	38	12		50 ft from Tree
	2	~~39~~	39	38	10		Bare
	3	~~42~~	42	40	10		Gravel
	4		43	41	13		"
	5		44	43	13		Sand
	6		44	41	12		"
	7		46	44	13		"
	8		47	44	14		Grass
	9		45	44	13		Dirt
	10		46	43	13		Grass
	11		43	42	12		"
	12		46	44	13		Dirt
	13		40	38	11		Grass
	14		42	40	13		" 156 ft to tree lower end of course
Av.			43.4		12.3 in.	28.3	

*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 by the circles. Particular care should be taken to note any *irregular* spacing between samples.

No.........of.........sheets. Comp. by.................checked by.................

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D[...] [...]phill. [...] Toward [...] [...] from

telephone pole.

2 other measurements (Nos. 6-7) as designated in Snow Survey Notes Dec. 4.

at right angle and almost in line with pipe.

Dyes. 25 ft west of Meas No. 4
" 35 ft west at angle uphill from Meas. No. 1 - in lee of clump of fir.
Both marked with stakes

Donner Pass.

West of snow-plow station uphill.
Course S. 6° W from solitary pole toward telephone pole by broken scrub.
Every 20 feet - 5 meas. to 38 ft from telephone pole.
2 other measurements Nos. 6-7 as designated in Snow Survey Notes Dec. 4.

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CALIFORNIA COOPERATIVE SNOW SURVEYS
SNOW SURVEY NOTES

Drainage Basin South Yuba River
Snow Course Donner Pass
Party Blair, Eddy, Arthur Chase, J.E. Church
Date Dec. 4, 1944

*Description or Number of Course (1)	Sample Number (2)	§Distance Between Samples (3)	Depth of Snow Inches (4)	Length of Core Inches (5)	Water Content Inches (6)	Density 100 x (6)/(4) (7)	Remarks
		—					
1	6 ft from N.1 pole		33	31	8		Toward telephone pole by broken scrub.
	2	20 ft	30	29	7		Dirt
	3	20 ft	42	40	13	31.0	Gravel
	4	20 ft	34	33	10		
	5	20 ft	44	43	12		38 ft to pole end of course
Dye 25 ft from ~~next pole west between poles~~	6	25	27	26	8	29.6	Dye black + red at
30 ft N. + right angles ~~from Telephone pole double braced~~	7	30	94	93	30	31.9	Dye "
	Av.		46.0		12.57	27.3%	

*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 by the circles. Particular care should be taken to note any *irregular* spacing between samples.

No..........of..........sheets. Comp. by....................checked by....................

6 ↑ 25 ft

60273 7-38 300 BKS.

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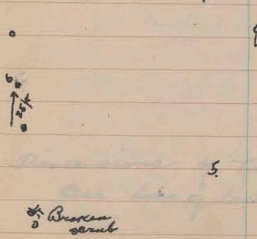
6, 0 Broken scrub

Dye: Black and Fuchsine placed at Nos 6 and 7.



Letter to Church from [illegible] J, Jan 3, 1945 in folder

2:30 p.m. Road to Soda Springs nearly clear of snow.

Trees also are rapidly losing their snow.

Lunch at Arthur's and copying of snow-survey records.

Snow Survey at Soda Springs

3 Snow survey charts for Dec. 4, 1944 in folder

Dimensions of Thermometer Shelter.
See back of last snow-survey sheet.

Crust and Temperature

6 pm.

Telethermo.	31°F
Min.	33.5°
H–T	33.5°
Max. for 5 hrs.	40°F
" " 2 hrs	41°

Crust:

on level	½ in.
Tilted to SW	½ in
Level (packed)	1 ¼ in.

Dye:

Dye in shaded angle of house red.

Also on snow fallen from roof.

air warm. Snow and wood reflect heat.

"Bloody Ground". Dye has been penetrating and spreading around the door.

Sno-Cat

Nearly rundown by Sno-Cat. Has been to Sugar Bowl. Brought curley back. Tobias is driving it under speed to test it. Looks like a speed boat for its spray. Climbs and descends the dam.

Bergman considers the transmission weak. "Tobias is planning a sled of thrice the size and power.

Movie: Color 100 ft long by Walter Herz. Tucker eager to have copy of it @ 10¼¢ per foot. (color to color).

Later: But Rochester will take no further orders for color reproduction, but only black and white.

Color film.

Have obtained for Gendel 2 (½ doz.) pkgs 3¼ × 4¼ in Daylight Kodachrome color cut film $11.56 (Includes developing).

Ice in Gages

Stevens S. Rainright 16.25 in.
Ice plate 6 in. diam.

No. 4 Diam. of ice 4 in.

Tuesday, Dec. 5

9:30 a.m. Min. last night 12.5°F
Pres. temp. 20.5°F; A-T 21°F.

Ice in Gages

Stevens S.
Ice solid. Center 2½ in. thick.
Reserve space above ice 13 in.

No. 3 Army Gage
Liquid.

No. 4
Ice solid. 1 in. thick in center.
Reserve 12 1/4 in

Reducer
Very thin shell ice.

No. 5 Shell ice and slush.

No. 6 Ice. Reserve 12½ in.

No. 7. Very thin ice slush; practically liquid. Reserve 35½ in.

No. 8 Ice; easily breakable. Max. thickness 1 in. Reserve 14¼ in.

No. 9 Unbreakable ice 7 in. diam. floating. Reserve 22 in.

No. 10 Did not visit. Assume the same. Yes, did.
Ice unbreakable 7 in. diam.
Reserve 21½ in.

Crusts
Crust of untouched snow 1 in. thick.
Last evening ½ in. thick.
Fine drift-snow crust in Pasture ¾ in. thick.

Gages Recharged

Stevens S

W. 17.21 in D. 11.0 in To liquid 12.9 in

No. 4

W. 14.04 D. 10.7 To liq. 12.9

No. 2. Stevens W

Pen and recording O.K.
Did not open inner case.

No. 6

W. 13.86 D. 10.6 To liq. 12.7

No. 7 1/3 run down. Rewound.

Revised reading in calm 15.64 in
But since winding 15.68!
→ Binding? Seems to bind and jump since the insides were wrecked by the horse running into the cable.

No. 8

W. 14.05 D. 10.7 To liq. 12.6

Dye in Pasture

Dec. 5. Noon.

Station No. 1 (Start) 25½ ft. from snow-board pole. Placed Nov. 17. (Snow-alone 33½)
Present depth 36 in.
Black dye 19 in. down.
Red dye at 3, in. 8-9 in., 11-11¼ in.
below black and 3½ in. above ground.
Lower 3½ in. coarse crystaline.
→ Very old snow; remained frozen after dye was planted.

Station No. 2 (Start) 10 ft farther E from No. 1
New dye. On surface of snow 36 in. deep.
Fuchsine has already turned red.
→ In the sun the dye from old sample No. 1 is growing redder. Due to increase in free water?

Precaution:-
Hereafter place samples dyes in a bucket and remove from field to prevent spreading of dye.

Reno

Planning to catch 2:15 pm. bus. Called to phone by Jewett Schramm. Overheard by Reno couple returning from California who offered me a ride with them.

So did not have lunch at Arthur's or pay my accumulated bill.

Warm. Road nearly clear. Forests have lost snow on branches except in the depths of Donner Pass above Donner Lake.

→ Get postcard of Mount Rose with Donner Lake in foreground.

Dec. 10.

At dinner at Mrs Graham's. Helen , Mrs Knight's daughter in law and ranch owner in Montana, revealed the following data:

1. Cattle get snow-burn underneath their bodies from brilliant sun on the snow.

2. When fog gathers in the valleys, men drive their cattle higher up the slopes to escape the cold that has condensed the vapor.

Both occurrences are dangerous, especially where light and cold are intense as on the Plains.

Dec. 13 -

The thermometer shelters are ready. The sheet-metal work of gages and drip-pan is done. Jack Ryan has been authorized to get a helper to complete the iron work.

Have written again for the Hygrd-thermographs from Glendora, Los Angeles.

P.S. — These arrived almost immediately afterward.

Dec. 19

"Gain in precipitation" Nov. 17 - Dec 3 in folder

Thursday, Dec. 28 New Apparatus.

The arranging of the new library was completed last night.

Gerdel and family left Soda Springs Saturday Dec. 23. Becky and family went up Tuesday Dec. 26 until New Years.

A quicker get-away for me than planned. But the Valley Express Co. can take everything and me included today. Jack Ryan can rush the essential equipment to completion by noon.

The sky seemed clearing. Then burst a wet blizzard. Jeff's auto without chains could not climb the hill to Station.

News that the "Palace" had been flooded with frozen water pipes, now that the fuel oil was out.

To truck station with all freight assembled at 3pm. Supper donated by freightmen of 3 wienies toasted over the fire. Fully and pleasantly replenished.

Started at 7:30 p.m. Flat tire repaired at "Les". Chains from Reno. Passed others stalled on the road. Dry snow swirls traversed the pavement.

H. I. Snider met us at Donner Garage, Truckee and next day hauled the Truckee equipment & the Ranger Station.

At Donner Lake Hotel left the bundle of poles for marking canvas. Morrison-Knudsen will probably remain there "for the duration". Offered us a meal.

At 11 p.m. Soda Springs. Driver Tony completes 9 years on this route on February. Driving trucks is an art like sailing. Both hands on the levers and chest on the wheel. Mutual Happy New Year at parting.

"Palace" found dried out and oil-stove burning warm. all happy. Peter had just joined the family from San Francisco.

Sky clear. Moonlit landscape. all apparatus stored.

20°F at Ranger Station.

Friday, Dec. 29.

Snowing! but barometer rising.

Instruments Reset.

About Noon reset H-T's and barograph.

Stevens W. O.K. i.e. the pen had not been tripped by the vibration from trains that made the "Palace" quiver.

→ Is the intensity of the vibrations greater in winter?

Calcium Chloride freezes over!

Stevens S, No. 4 and No. 8 and probably the other small gages have ice beneath the snow. So freeboard for snowfall necessary. The double charge Dec. 3 was insufficient.

→ Check this out.

Snow in Gages

Snow in orifices but no clogging.

Stevens Q (No. 7) Snow up intake

Nos. 6 and 8 - Snow caps on both.

Pasture 1:45 pm. Anemom. 925 mi.

For period Max. 42.6°F Reset 26.0°

Min 5.2 " 24.4

(N.T 6°F)

Tin of wind shield blown upon orifice of No. 6!

Stevens S. Weight at 6pm 22.12 in.
Ice 9 in. below rim.
Snow 1/2 in. below rim in SE and
4 1/2 in. " " " in NW.
Wind blowing from NW.

No. 4 Snow domed over
Ice 8 in. below rim

No. 3 Army Engineers
Slush.

Query: Efficiency of Calcium.
Rain Dec. 18-22 4.11 in. and snowfall of only 3 in.
Sufficient to dilute contents to freezing at +5 to +10°F?
Then double charge quite insufficient for even less than normal precipitation? Norm. 6.80".

Even in 90 in. charge of No. 3 — double normal for the annual precip. — slush has occurred after only two months (Recht (Nov. 7) and total precip (No. 1 gage) of 14.18 in. (Norm. Nov. 4.62 in.; Dec. 6.80 in.; total 11.42 in.). The excess precip. is therefore only 2.76 in. this season.

→ Fortunately in the case of seasoned gages like No. 3 and No. 2 the temperature becomes higher as the dilution increases. Thus with heavy charges, slush may represent the maximum freezing at the coldest period of the year.

→ Test all gages tomorrow.

Query: Does water ride on the solution and freeze? Even rain? At least the ice floats and is a continuous mass.

Must we have more frequent charges?

Min. temps 43, 42, 48, 43, 40°
" " 29, 32, 33, 28, 32°F.
What was rel. humidity and temp. of rain?

Storm of Dec. 18-22

Arthur reported a heavy rain during Dec. 18-22 of 4.11 in. and 8 in. snowfall. Snow depth fell from 32 in. to 26 in. or a total of 6 in. in 82 hrs. The snow was saturated, and Gerdel stood about for possible flood. Study dye and density.

Saturday, Dec. 30

11 am. Weather clear, calm.

Frost flakes in air and are visibly falling.

Min. temp in Pasture -3.6°F (H-T -2.5°)
Current temp. at Noon 20°F (H-T 17°)

New Snow

23 in. deep. Powderline, dusty when lifted by snowshoes. Absolutely no crust. The air "woofs" out of the snow when trodden by wider web-snowshoes. The snow is full of air.

At Station No. 9 of snow course dens. 21.2% but at Station No. 10 only 9.6%

No. 9 Can 3 ft. tall.
yet snow cap 2 in. above top.

Ice 16 in. below rim.

No. 10 Can 3 ft tall.
Snow 2 in. above rim.

Ice 15 3/4 in. below rim.

Hotel

No. 4
yesterday snow cap.

Today 4 1/4 in. below rim.
Ice 9 in. below rim and loose

Reducing Cellar

Snow 10 1/4 in. below top (ie. rim)

Ice 26 1/2 in. below rim

NB – Snow in No. 4 (vertical) is loose and in Reducing Cellar retracts.

No. 3 – Army Engineers

Slush. approx. 3 1/2 ft from top of can to slush.

No. 2 (Stevens VT)

apparently contents are fluid but a sugerloaf of snow is floating at one side of the tank below orifice

Rem at 6.01 in from left hand margin = 12.02 in. precip.

But weighbeam is high and motor will not run.

→ Batteries dead? New outside cabinet of cells should be tried. Cut hole

thru outer case for trunk wires.
Rewound clock to keep it running.
until motor can be set to running
and the accumulated precipitation
recorded.
[NOTES on Stevens S (gage) Dec. 3 in folder]

Snow melting where it lies thin on
the wood and is exposed to insolation
from it.

Stevens S Wt 22.48 in. 0.36 since yesterday
Snow now completely melted.
→ Can is black inside, olive green outside.
Dee 7½ in. below top and very loose.
→ No. 1 for 5 pm. Dec. 29 . . . 0.22 in.
Stevens S did well with 0.36 in. in
view of shallow freeboard.
Dec. 5-30 . . . 5.27 in; No. 1 - - 5.51 ? Dec. 30 ? 0.36.
5.87
- 0.60 in.

Dye

No. 2 planted Dec. 5 - 10 ft beyond No. 1
Descended 17½ in. Stopped 4½ in.
from ground. Dye purple, frozen.
New snow above dye 25 in.
Total depth 47 in.

Snow depth Dec. 5 . . 36 in.
Depth of old snow Dec. 30 . . 22 in.
Shrank Dec. 18-22 from rains from 32 in.
to 26 in. Compressed 4 in. more
since that time? No free water
or at least gravity water in bottom
4½ in. So no runoff loss.
But this is not on the snow-survey course.

Snow Survey Test

(Snow survey chart for Dec. 30 in folder)

Density:

No. 9 Old snow 32.2%
New snow 21.2

No. 10 Old snow 36.4%
New snow 9.6

→ The old snow seems too light in density to have lost its capillarity.
Study Tahoe Tavern "ripe snow".

elevs for gages 9 + 10; measurements for Nov. 7-Dec. 29, and precip. for Dec in folder

Snow Cover Dec. 4 to Dec. 30.

Nos. 9-10 Dec. 4 11.0 in. water equiv.

Nos. 9-10 Dec. 30 13.0 in. " "

Net Gain 2.0 in. " "

Precip. Nov. 4-30 5.87 (No. 1) " "

Loss . . . 3.87 in.

Evaporation 2 in. ?

Query: Could melting and runoff have occurred on No. 1 course and not where the dye test was made?

→ Try Summit Course No. 1.

Comparison of H-T's

4:30 pm On throttle 25° (as corrected Dec. 31 . . 27°F)

4 ft. above snow 26.5° F.

Pressed snow is freezing in the shade.

Query: Is the zone of freezing temperature only very close to the snow surface?

Caught "Wild Cat" Bus at 5:30 pm for Reno. This time the "Drumkards' Special". But arrived about 7. Train came only at 8 pm.

In afternoon phoned to Snider. Because of holidays Sunday-Monday, he suggests that equipment be installed Tuesday.

Phone call from Mr. Fletcher at Sacramento. Gendel and Ashton want to come up Tuesday Jan. 2 with Koch and another and Paulson. Appointment long since made and limited to two days. Would I not remain for the conference?

Agreed to vacate the family and remain.

Dennis granted permission to place 16 in precip. gage on the oil tank.

Sunday, Dec. 31 Caught 8 am belated bus for Soda Springs.

Remained at desk all day transcribing notes. So. was too late for some observations on incipient crust formation

Wind Shields

Letter from Phillip Light says he has not made "any statistical analysis of the relative efficiency of shielded and unshielded precipitation gages. . . Comparison between the two types of gages should probably be made on the basis of wind velocities during storm periods".

Crusts of yesterday?

11 a.m. Snow soft and fluffy except one slope of dump ate door where crust found 1/4 in. thick but some of it covered by 1/4 in. soft snow.

4 p.m. Temperature

Posture

1. Hyt. H-T (Failed to wind clock)
   Max. Dec. 30 . . 36.0°F
   " Dec. 31 . . 37.0°F
   Min. " -9.5°F
   Current temp. 28.5°F

2. Platform (H-T. readjusted +2.0°F)
   Max. Dec. 31 . . 32.0°F (corrected)
   Min. " -2.0° (")
   Current temp. 29.5°F

Note in "Dimensions of c—n" in folder

Dec. 5 tag glued in

→ Is the zone nearer the snow subject to greater extremes of max. and min. temps?

Crust Today

Max. shade temp. 37°F

(a) But no crust on level where snow is white. Flakes fluffy.

(b) In snowshoe cut, the vertical wall exposed directly to the sun already at 4pm has frozen ½ in.

H-T at 4pt is 26°F.

When did the freezing begin? The sun's glow (just above Beacon Hill) still casts a faint shadow thru the thin cloud overcast.

(c) On gentle south slope on highway to Donner Summit Lodge crust at 6pm is ½ in. Snow here not so white and at edge of snow clearance.

Try dyes tomorrow.

On Beacon Hill when the shadow covered the slope, Barry heard the crackling of freezing snow crystals* that flashed up vertically in the sun.

*Hexagonal prisms at right angles to the plane of the sun.

Monday, Jan. 1, 1945.

Clear, nearly calm.

H-T's

1. 4ft H-T
   Min 0°F Current temp. 38°F
2. Trestle +4.0°F " " 36.5°

Air temp. both warmer and colder near ground. So temp. at which snow freezes may be even higher than believed. Should have another H-T 1ft above snow.

Dye Planted

1. 7ft. N. of original No 1.
   On surface only. Black and green.
2. 14ft. N. of original No. 1
   2 in. below surface to avoid effects of opaque dye.
   But black placed on surface.

2:30 pm. Snow Survey - Course No. 1

3 Snow survey charts of Jan. 1, 1945 to folder

New Snow	D.				W.E.	
No. 8	14.8	cc	66	68	2	
No. 9	15.2	cc	66	69	3	
No. 10	16.5	cc	66	68.4	2.4	
Av.	15.5 in				2.47 in.	Dens. 15.9%

4:15 pm.

Crusts

1. HfH-T Max. 40°F; current 39°F
   Incipient crusts or frozen crystals in shade and within the snow in sun. Sun just above Beacon Hill.
2. Trestle Max. 37°; current 36.5°

But on sharp slope at "Palace" door the snow is still soft.

4:50 pm. Sun has set.

In shadow

1. HfH-T 36°F

   Vertical wall of snowshoe trail- and level, crust of each ½ in.
   Lee wall (in shade all day) soft and dye still green.
   In hole in floor of trail, dye still green where shaded during day, tho red this morning where in sun.

Test plantings in snowshoe trail.
New plantings remain green on level but turn slightly red on vertical

vertical wall turned during day to sun.
→ Snow still has some free water between the freezing crystals.

5:30 p.m.

Gages.

No. 6 R. 19.83 in. D. To ice 6 1/4 in.

Diam. of ice 6 1/2 in.

D. To water 7.0 in.

→ Ice floats 3/4 in. above the liquid.

So depth to liquid or of liquid would be inaccurate; also depth to ice.

→ Dec. 5 13.86 in.

Jan. 1 19.83 in.

5.97 in. No. 1 . . 5.87 in. These frozen gages are absolute beyond belief.

5:45 p.m.

Crusts

4pt H-T 26°F

Ice refrozen to steps of Gage No. 6.

6:00 p.m.

Snowshoes frozen stiff.

6:15 p.m.

Crust on highway to Donner Summit Lodge 1 in. thick - on slight S slope.

Slush frozen brittle.

7:00 p.m. Snow at "Palace" 1 in. frozen.

Triple Register ran only 6 hours today.
Some one has taken the globe.

Called up Mr. Snider. Hjalmer Bergman can take me down Thursday.
Could not get Donner Lone Hotel

Arthur Caillard will change the Kft x-T weekly and read the anemometers at Gages Nos 9 and 10 at beginning and end of storms. Offered him $5.00 per mo.
Wind from the east and strong.

Cesspool -
"Curley" called to give me a picture of cesspool trouble.
It did back-up into shower bath, but he and Gendel removed the cap of the vent outside and provided relief.
No the overflow will pass off beneath the snow.
Conduits in pool probably clogged by Jesper. Over only 4ft below ground

Paper can be poked thru or — with pump and tank can clean the pool. Better done when snow disappears. Three pools now at Hotel.

Comparison of Gages

Dec. 5 - Dec. 31

No. 1 - 5.87 in.

Stevens S - 5.27

No. 6 - 5.97

No. 7 (Stevens Q) 6.10

Gerdel-Friez Dec. 23 11 am - Jan 2 4 pm 1.95 in.

(No. 1 - 1.48 in.)

No. 4 Dec. 3 - Jan. 4 6.75 in.

No. 3 (S) " " 16.1 * 17.75

No. 2 (SW) " " 7.85 * 8.99 = 5.70 + in.

Redwood Cellar " " 11.8 - 15.4 * = 3.6 in. = 6.86 in.

No. 8 " " 8.26

* Divide by 0.525

Tuesday, Jan 2.

Cleaning house
at 10:17 Peter left for S.F.
Becky, Marsha-Jo, and Marshall
take the 5:10 p.m. train for Reno.

Clear, calm, pressure high. Air becoming springlike.

Noon.

Crusts

H-T°- 4 ft. Min.: −4.0°F; current 36°F
treetle +6.0°F; " 34°

Pasture: On white level surface no crust at all.
(No melting yesterday?)

On exposed edge of trail crust 1/2 in
On level no crust.
" " crust 1/8 in. Frost condensation 1/8 in.

at Hotel: On gentle sun slope crust 5/8 in.
Frost 1/4 in.
On 35° slope toward sun crust 1 1/4 in
Frost 1/4 in

Weather Record January, 1945

Date	Max.	Min.	Precip.	Snowfall	Snow on Gd	Wind	Clds
Jan. 1	39	5			43	SE	clr
			#1	190			
			2	122			
" 2	55	2			41	SE	clr
			#1	293			
			2	229			
" 3	51	-3			41	SE	clr
			#1	364			
			2	270			
" 4	49	+1			41	NW	clr
			#1	441			
			2	323			
" 5	45	25	0.05	T	39	NW	clly
			Beg. 4 am. End 7 am.				
			#1	475			
			2	367			

Pasture
For Period
Max. 48°F Reset 38°F
Min. -12° " 37°

Jan. 6 52 22 36 SE clr
#1 522
2 424

" 7 59 22 35 SE clr
#1 582
2 481

" 8 61 11 35 SE clr
#1 665
2 555

" 9 56 12 34 NW P.cldy
#1 737
2 611

" 10 46 25 0.21 in 35 NW cldy
Reg. 6am End 12am (Noon)
#1 790
2 665

" 11 40 14 35 SE clr
#1 889
2 756

" 12 52 12 34 SE clr
#1 974
2 832

Jan. 13 56 21 34 NW Clr
#1 45
2 888

" 14 55 18 33 NW Pt cldy
#1 127
#2 —

" 15 45 21 0.21 2 35 SE Pt cldy
Began 3 a.m. Ended 7 a.m.
" 4 p.m. " 9 p.m.
#1 218
2 77

" 16 32 10 0.12 35 NW Clr
#1 306
2 182

" 17 34 11 0.31 3 37 NW Stormy
Began 1 p.m. Ended DN - During Night
#1 414
2 301

" 18 32 3 0.09 1 36 NW Clr
#1 502
2 398

Jan. 19 29 5 35 E* Pt Cldy
#1 575
2 488
* Triple neg. NW!
Short?

Pasture - Period
Max. 54 Min. 2
Reset 24 19

" 20 23 7 35 E* Cln
* Triple neg NW!
#1 698
2 651

" 21 27 12 35 E Cln
triple neg. NW!
#1 872
2 852

" 22 29 7 35 E Cln
#1 74
2 64

" 23 45 10 35 E Cln
#1 244
2 252

Jan 30 45 16 0.08 ½ in. 33 SE Cldy
Began 9:30 a.m.
#1 802
2 680

" 31 34 29 1.51 14* in 46 SE Stormy
* at Tahoe snowfall 7 in
#1 ~~874~~ 824.3
2 754

Feb. 1 41 31 2.32 12 56 SE Stormy
Rest 40° 38° Raining during night
#1 856
2 837

Feb. 2 40 27 3.22* 12+ in 58 SE Stormy
#1 70
2 61
* Contents frozen in hand.
Required 2 tubes hot water to melt it.
a.c.

Feb 3 40 28 1.64 14 67* SE Pt Cldy
#1 140
2 140
* My reading 70 in.
Stevens S 1.22 Reservoir only 8 in.
Snowfall 14-16 in

Conference (Cont.)

At 4 pm Army Engineers Bingham, Cook, and Walter Gardner arrived.

Came particularly to see Project and Dr Gerdel. Present project is to train men to determine feather-edge snow line and the quality of the snow. To predict floods.

I suggested aerial photographs of the position of the snow-line at 100% or normal snow, 125% and 75% — of course at normal temperature as a background for abnormalities.

Also the use of fuchsine dye and intensity of color as a substitute for the laborious calorimeter measurements.

Of course snow sampling would be employed.

Three stations now in prospect: Soda Springs, near Portland in Cascades, and in the Clarks Fork - Snare Basins.

at 6 pm. Becky, Wanda-Jo, and Marshall took train home. Becky's arm is numb and worries her.

Loss from Snow Pack

at Dye Station No. 2 dye was found by Bingham and me to have penetrated to the bottom. Earlier meas. showed no movement below 4½ in above ground. So snow cover has evidently lost by the rain of 4.11 in Dec. 18-22 despite the temp. below freezing found in the snow by Gandel.

Wednesday, Jan. 3

Field conference.

4ft H-T Min. -13°F; max. yesterday 52°(?)

Trestle Min -8°F; " " 48°(?)

Current temp. 4ft H-T +2°F.

↑ Dyes green or purple on top of snow and throughout a core.

Pogonip very heavy - Photos taken

Gandel-Friez well made - Tower stiffened. Codd believes that loose joints cause the excess in oscillation of the pen.

Crust and Pogonip.

Where snow untouched or pure white, it is still soft.

Maximum crust on level ½ in. with pogonip of ¼ in. covering it.

→ Bingham: "Dew is evaporated and recondensed and deposited next night - But evidently pogonip remains and is consolidated with the snow crust. So cumulative."

→ Later the ripening of the frost crystals could be fairly noted. Could they not be photographed?

Snow Surveys

Blair Eddy and Newt Chase came to assist me with snow surveys. We all went to Donner Summit together to look over the courses and down at Donner Lake and Mount Rose.

Donner Summit

FORM 130

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES
401 PUBLIC WORKS BUILDING
SACRAMENTO

CALIFORNIA COOPERATIVE SNOW SURVEYS

SNOW SURVEY NOTES

Drainage Basin Sf. Truckee

Snow Course Donner Summit

Party E. Eddy & H. Chase + H. Church

Date 1-3-45

*Description of Number of Course (1)	Sample Number (2)	‡Distance Between Samples (3)	Depth of Snow Inches (4)	Length of Core Inches (5)	Water Content Inches (6)	Density 100 x (6)/(5) (7)	Remarks
	1	——	30	30	9		Rock
	2		26	25.5	8.5		Gravel
Meadow	3		46	45	16		✓
	4		36	35	12		✓
Course	5		49	47	15		✓
	6		56	54.5	19		✓
	7		80	78	26	32.4	Ice
			46.1		14.93	32.4	

*Show number or description as given on sketch map, *i.e.*, "Course No. 1," or "Major Course," or "N D' 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 by the circles. Particular care should be taken to note any *irregular* spacing between samples.

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Dyes at Summit

On nose of hill.

Sampler depth 83 in.

Dye stratum began 39 in above ground and ended 11½ in above ground.

New snow 32½ in?

New planting at same spot.

Density lighter than lower at Summit Valley No. 1. Why? More windblown? No, dens. practically the same. Possibly less rain.

Summit Valley No. 1

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Drainage Basin S. Y. River

Snow Course Summit #1

Party D. E. Eddy & H. Chase & M. Church

Date 1-3-45

*Description or Number of Course (1)	Sample Number (2)	†Distance Between Samples (3)	Depth of Snow Inches (4)	Length of Core Inches (5)	Water Content Inches (6)	Density 100 x 6/5 (7)	Remarks
	1	25	37	36	12		Dirt
Key	2		39	37	13		Bark
	3		42	41	14		Wet snow
Course	4		44	43	15		Dirt
	5		46	44	16		Gravel
	6		46	44	16		"
	7		50	45	17		"
	8		51	45	17		Grass
	9		49	45	16		Mud
	10		51	45	17		Dirt
	11		47	44	15		"
	12		42	40	13		"
	13		40	38	14		"
	14		41	38	14		"
		14	625		209.0	33.4%	
			44.6		14.9	= 31.3%	

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

†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 by the circles. Particular care should be taken to note any *irregular* spacing between samples. Uniform

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aided by college girl from Mills College.
at Kiski Lodge; Sciences major. Deeply interested
and a smile. Lunch at Kiski.

Dyes in Summit Valley

Dye Station No. 1. In shade of trees.
Depth 49 in.; new snow 19 in.
Dye stopped 18 in. above ground.
Stratum of dye 11 in. thick.
Soil moist but friable. No free water. Snow dry crushes.

New planting 3 ft N of stake.
Red tiny specks beneath the green.

Dye Station No. 2 - In open sun. Middle of old highway.
Depth 42 in.; new snow 22 in.
Dye stratum 18 in. wide reaching to bottom.
Color brilliant for 6 1/2 in. from bottom. 85% brilliant.
Snow moist packs. → New dye 3 ft west of No 2. Dye started to turn red. upper 1/2 in moist. (Below snow dry.)
Any water lost?
→ Make comparative test of Summit Valley No. 1 and Soda Springs No. 1.
Must have been loss at latter.

Dye at Soda Springs
Dye Station No. 2
Reexamined today showed dye penetrated to bottom. So loss demonstrated.

Mr Bingham deeply interested in days results. Greetings to Koch.
Their return delayed by freezing of their motor. Towed by pickup truck to Soda.
Cold tonight.
Tomorrow Truckee.

Thursday, Jan. 4 1945

Hjalmar Bergman must be at Soda Springs at 4:30 p.m. So we agreed to go to Donner Lake only.
Drift 1 - 3:30 p.m. Road dry and wide. Hospitality offered by time-keeper at Hotel for Morrison-Knudsen.
Staked first leg of Donner Lake Course every 50 feet with two dye stations at W end: No. 1 Dye Station, (in shade) 10 ft beyond Stake No. 8 toward snow-course marker and No. 2, (in sun) 10 ft. N of Stake No. 8.
Dye planted and covered with new snow. No. 1 showed slight tendency to turn red.
Snow dry powder but in some stuck to neb-snowshoes. Ground friable

~~Frozen~~ Frozen 1/8 - 1/4 in. Snow dry, except slight tendency for newly planted dye to turn red.

Overcast. Snow sifted from trees.

Snow Survey - Donner Lake

2 p.m.

Snow survey chart for Jan 4, 1945 in folder

D. 24.6 in. W.E. 8.11 in. Dens. 33.0 %

Density due to rain? Dens. of new snow?

Photos. - Jan. 3 Spool No. 2 Frost and Donner Pass; Spool 3. No. 1 Donner Observatory
Jan. 4 - Spool No. 3 No. 2 Donner Lake Course

Record of Precip. Gages

4 June
Hotel.

No. 4 W - 19.72 in
To ice 6 1/4 in
To liquid 7 1/8 in.
Diam. ice 6 1/2 in.

No. 3. (Army Engs)
Ice breakable.
D. of liquid 17.75 in
D. to liquid 41.8 in

No. 2 (Stevens W)
D. of liquid 8.99 in.
D. to liquid 35.2 in.
D. to ice and snow 32.2
i.e. ice and snow 3 in. above liquid.
Covers 2/3 of area of tank.

Thermos bottle effect: slow to freeze but slow to melt. So accumulating despite larger load of 90? in. calc. chlor!.
But in No. 3 - no insulation, ice is readily melted by sun. Recent nights below 0°F!

Reducing Collar (Jan. 3)

D. of liquid 15.4 in.
D. to liquid 26.6 in.
Ice perhaps 1 in. above liquid.
Diam. of ice in 11 in. can too great to come thru 8 in. orifice.

5 pm.
Pasture

No. 8 W. 19.000 (Odd)
D. to liquid 7 5/8 in.
D. to ice 7 in.
Diam. of ice 6 1/2 in.

No. 9 Too heavy for opt. bal.
D. to liquid 15.3 in.
D. to ice 14.2 in.
Diam. of ice 6 1/2 in.

No. 10 Too heavy for opt. bal.
D. to liquid 15 3/8 in.
D. to ice 13 7/8 in.
Diam. of ice 7 in.

Red Tower No. 1 -

No ice, but only one month and not diluted therefore so much as Nos 9 and 10 and more heavily loaded than the 24 in. gages.

D. of liquid 5.35 in.
D. to liquid 45.8 in.

Crust and Temp.

5 p.m.
H-T (Hotel) 42°F when crust had begun forming (Cobb and Pat.)

6 p.m.
H-T (Pasture) Hyt. 38°F. Crust 1/4 in. (Cobb and J.S.C.)

8 p.m. Water on snow in trail near highway still unfrozen.

Pasture
H-T Hyt Min. -6.0°F
H-T Trouble Min. -2.0°F

→ Dye. Ashton suggests shaving dye thru fine meshed cloth or wire screen to distribute the fuchsine dye more thinly and evenly.

Tests

* Gerdel and Codd have set the Russian (Teapot) Gage on the tower of the Reducing Cellar. Installation perfect.

Tonight Gerdel made a grill of wind shield fins to paint various colors and enamels to seek a surface to which sleet will not readily attach.

The teapot gage is too diminutive and seems built for rain only or very small falls. Snow that will be measured and emptied each day. Always danger of freezing.

The baffles are desirable but may hold snow up.

bottom can, about the diameter of the snow core.

*

Friday, Jan. 5, 1945

Last evening barometer still steady but air vaporous and moist. Storm must be coming.

This morning condensation dripping from the roof. Fog or cloud. Fine moisture in the air. Barometer falling gradually.

A Lucky Day

Gerdel and Codd plan to recharge all but seasonal gages. Ice is too high. I shall reset the H-T's.

Since double charge freezes anyway, it was decided to use only a single charge and thus obtain more freeboard for the snow.

But at 10 a.m. Hjalmar Bergman, as agreed, brought Ralph Rawson, carpenter from Ice Lakes, to go to Truckee to

install the station there. He must go at once in order to return by 4 pm.

So I left the gages entirely to Gundel and Ashton who bade me go.

Precip **Jan 5 1945** Recha

Gage No	wt	Depth	Point	wt.	Depth	Pt.
6	19.9	16.4		8.25	6.4	
7 (a)				On chart 7.25" Jan 6 6.0"	change as weighed in.	
8	19.05	15.5		8.43	6.4	
9	23.05			11.0	8.0	27.0
10	23.35			11.0	8.0	27.2
4	19.75	16.2		8.35	8.0	
5	22.54	16.0		11.34 (Jan 6 11.33)	8.40	

FW Gundel

Truckee Project

Out of the rain and below the clouds. Sky overcast incl. Mt Rose. Snow mount. to net.

New snow 6 in. Total depth 14 to 20 in. Old snow very granular.

Mr. White had broken or sprained his ankle skiing and was being taken to Reno by Leo, Asst Ranger, for an X-ray examination.

Mr. Snider was in conference but placed tools at our service.

The toboggan was made from skis.

Carried the heavy thermos shelter easily. Legs made of gas pipe in flanges

Lucky for us. Too heavy for three.

Location

N.E. of Office in large opening 200 ft square in semi-sun and shade.

Snow Course

W & E 25 ft. 8 meas. No. 1 25 ft from Course Marker, No. 8 28 ft from terminal Marker.

Survey by Hjalmer and Ralph, since dependence must be placed on helpers.

Snow Survey Chart from Jan 5, 1945 to Feb

Melt Pan and Tank

Used spoon shovel to dig hole. Struck a rock 6 in. too soon, but built up the soil under the pan. Replaced dirt around tank.

Left pan empty — to be filled by new snow. Buried snow shoveled away to avoid radiation effects.

→ Pan should be painted a matt white.

3 p.m. Tank filled with charge of calc. chlor. and oil 2.1 in. Pan empty and dry.

→ Need meas. stick 8½ ft. long with 2 or 3 redwood sticks (24 in each) on a 3/4 in. staff.

Dye Stations

Left 1 can of fuchsine dye for use at Truckee and Donner Lake.

No. 1 Opposite (right angles) and S of No. 3 . . 20 ft
In shade. New snow 5 in. Staked.

No. 2 " " " S of No. 5 . . 20 ft.
In semi-open. New snow 6 in. Staked

No. 3 " " " N of No. 5 . . 20 ft
In open. New snow 6 in. Staked.

Dye

Dye brilliant on surface.
At 4 in. depth dye turns red slowly

Completed installation 3:15 pm.
Left sheets, dye, ink at office.

Hygro-Thermograph Station

H-T checked by dry bulb of sling psych. as in case of H-T° at Soda Springs
So the three insts should be comparable.

Max. and min. dirty and mounting
→ badly gummed. Broke max. in trying to shield it behind H-T and colliding it with my hand.

Bring solvent and oil. Also new max. and metal-less clear therms for Truckee and 4th H-T°.

→ Bring also strips ⊐ for legs of H-T° to stand or slide on.

Joined truck at main street.
Home 4 pm. Brought 6 rolls toilet paper

Resetting H-T°

Arthur Cowllard had reset all except 4ft

H-T on Trestle reset 3:30pm
" 4ft " 4:30pm

At 4:30 - Trestle Current 36.5°F
4ft. " 37.5°

Gage No. 7 (Stevens Q) 6in. Reset. (?)

Dye

Dye Station No. 1
On snow everywhere brilliant. = 90% (?)

→ Make a key or chart. How?
By water quantity or water temp. into freezing?

9pm. misting. Lights almost aureoles

Wet bulb 34°F
Dry bulb 36°
Telatherm 37.4°

No crust yet. Moisture near freezing.

→ Will it freeze tonight?

Hjalmar too ~~busy~~ Help this week and * help me more. Recommended Ralph , carpenter.
Thus can complete all construction.

Saturday Jan. 6

10 am   Dye and Crust

Dye in shade purple; in sun red,
Min. 4ft 20°F

Dye Station No. 1   Crust last night 1/4 in.

Donner Rock Observatory

On Way.

Took two girls and a boy to Sierra Club Hut. Came on early train. Had ski and suit cases and no rides. Mimi Henderson and x, whom I made my letter guest at the Hut. First use of my membership since 1895. "Great Good Luck" said the girls.

Sierra Club

Then called for Joan McCagg, Mills College Science Major, to join us to Donner Lookout.

→ She would like Human Side of Snow,

Ralph and she pulled and pushed toboggan load all way up hill to the Observatory. We should not have left our webs behind.

andrews on ship.

Erection of hula-skirt gage very easy. So I had not given Jack Ryan the slope of the rail on the walk. "The rail and walk will give way before the lag screws and bolts," Ralph.

A fine piece of designing and construction.

Joan's chum had followed us up later on ski.

Andrew's called our coming an "official call" and let us all in to inspect.

Report

A report once a month of the gage with the other (unshielded) will be very satisfactory, I assured Andrews. The comparison will be well worth while.

→ Should a funnel be used in summer to avoid evaporation? Means, every 6 hrs with the other with means, in the same brass (small) tube for both.

Left for Soda Spgs at 1 pm.
Overtook Marshall at Beacon Hill Lodge.
Took him and Ralph to lunch.
afternoon. Construction
The 16-in. Gage
Ralph has erected a broad, long walk on top of oil tank for the 16-in. gage. Can not slip. Could use a shorter ladder.
Tomorrow he will make the cat-walk extension on the Hotel Platforms and line the bed-rooms.
I will paint Gages No. 2, 3, 4, Stevens 5, and perhaps Nos 9 and 10.
It will feel good to have the work complete.

Crusts

5:35 pm.
H — T°
Treatle Min. 21°F Current temp. 38°F
Headings. Blow spaces
Dye. 4 Ft. Min. 19.5°F Current 39.5°F
Station No 2
5:20 pm Crust forming
* No. 2 (new station) Dye on top crust crystals green; beneath pink.
By 5:45 pm. Pink has descended to 1½ in. Still visible there

Dye Station No. 1 (placed last night)

Dye 90% intense. Has descended 2½ in below max surface, but where surface is sunk into a bowl by insolation on the dye, depth of dye is 1 ¼ in

Dye planted at 5:45 pm

Remains wholly green both on untrodden snow and in trodden traces the side wall of traces showed pink tinge.

→ So cold is rapidly passing into the snow

→ See crust tomorrow. How thick or deep?

Gage Check

No. 7 (Stevens Q) 6.0 in.

Stevens S 11.38 in.

7:30 pm.

Shell ice near Donner Summit Lodge.

Ice muddy road fragile.

Crust at "Palace" 1/4 to 1/2 in.

* Arch Work called on way from Berkeley to Reno for conference on snow-survey cooperation.
Has shown methods here. Tour Marshall and me to Reno at 5 pm. Showed him the various courses, enroute.

Sunday, Jan. 7, 1945

Dyes

10:30 a.m.

Dye No. 1 - Purple - Crust 1 in.

Dye No. 2. Dye returned to green except tiny spot in center of dark dye now warmed by sun.
Last evening descended 1/8 in.

Dye No. 3 Dye placed at 5:45 pm still green.
Where I am kneeling, snow already pink. Pressure?
→ Test thermometers with intensity of color.

H-I

Hpt. Min. 20°F Current 30°F
Humid. 85%
Trestle Min. 20° " 29°
Humid. 96%

Heavy fog has now disappeared.

Gages

* Stevens Q - - - 6.0 in.

Wednesday, Jan. 10

Sno-Cat

Reno to Soda Springs with Arch Work 8:30-10:30. Becky Demarest came with us.

Cloudy at Reno, raining at Truckee. Chains near Donner Pass, snowing at Soda Springs.

Tucker here with Sno-Cat for demonstration. Took 2 towers in one load to Norden with at least 4 passengers and went on to Sugar Bowl.

Arch likes the Sno-Cat but sees desirable improvements and the need of a lower price.

Towers without Shields

2:30 pm. Went to Norden with Ashton Tolle to assist in erecting a tower there. A job for two men.

The two new towers will be without shields for purpose of comparison with two neighboring shielded towers as they should be.

* Because of trees and building, Gerdel suggests that 16 in. gage be used only in comparison of bridging orifice rather than catch. agreed. Too much like Gerdel-Frey gage in location.

6 pm - New Gages

16 in. Gage 3 ft Tall on Oil tank charged with 32.50 in.

D. 6.4 in. Depth to liquid 29.7 in.

*

11 in. Gage 3 ft Tall on Platform extension charged with 16.30 in.

D. 7.2 in Depth to liquid 26.8 in.

Orifice 11 5/16 in., remainder of can 11 in.

Better replace with can of 11 5/16 in. thruout.

16" charge for 11"

$CaCl_2$	H_2O
6.85"	9.15" +0.3" oil.

32" charge for 16"

$CaCl_2$	H_2O
13.70"	18.30" +0.5" oil

Changes suggested by Gerdel. 11.35

Stevens S W. 11.58 in.

Jan. 6 11.33

0.25 in.

NB. 1 Jan. 10 0.21 in.

6 pm. ~~Temp. and Crust~~

H-T Hotel Current temp. 36°F

The surface of drier snow crusting.

→ the drier snow freezes earlier than the wetter providing the former has been melting.

8 pm Snow on highway frozen crisp but slush is still soft below.

→ snow and ice radiate cold more rapidly than water.

10 pm. "Say clear as a crystal". - Ashton

Dye

Dye has been put to test by Cadd and Gendel. true to earlier behavior.

But they suggest controlling amount put on snow by fine screen or single-hole pepper shaker.

Thurs. Jan. 11

Painting Cans

Spent 2 hours after 10 a.m. sweeping and scraping hoarfrost and ice from gages preparatory to painting.

→ Effect of cold solution.

Like a pitcher of ice water causing "sweating" in summer, today No. 3 Army Engineers Gage caused repeated glaze on the surface of the tank after cleaning away.

An argument, says Ashton Cadd for his long-held belief in artificial heating of gages, but with thermostat control.

Painted Stevens S, No. 2 (Stevens W), No. 3 Army Engineers, ~~No. 4~~, ~~No. 5~~, No. 7 (Stevens Q), ~~No. 8~~, No. 9 and No. 10 a matt black with numbers in orange.

Nos. 1, 4, 6, 8 are copper. Only the "Texettle" and Fig. 5 are unpainted. The wind shields remain galvanized except "Texettle", which is black.

Crust

From yesterday's rain and melt, the crust last night was 3 in. at Hotel and Pasture. The min. temp. was 14°F at Hotel.

6 pm.
Current Temp. Trestle Min. 34°; H-T 34°F
Hf. H-T 36°F
Teletherm 37°F (a few minutes later).
New crust already formed is 1/2 in.

Snow Cover at Store 35 in.

8 pm. Slush frozen brittle.

Stevens

Three No. 1 3 — 13.55

16.10

13.55

2.55 in

Nov 26

No. 1 — 1 0.32

29 0.57

30 0.31

Dec. 1 1.38

2.58

2.58
.26
2.84

~~Stevens~~ S 2.85 in

2.85

~~1.20~~

Fixez

From Notebook #18, Dec 4, 1944

FEDERAL AND STATE

COOPERATIVE SNOW SURVEYS

State California

Drainage Basin South Yuba River

Snow Course Soda Springs No. 1

Party J. E. Church

Date Dec. 4, 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	28 -1.0	26 -1.0	66	74			Dry dirt
	2	33 -0.3	31 -0.3	66	75			Ground wet
	~~3~~	—			—			Road
	4	37.5 -0.5	33.5 -0.5	66	76.5			Wet dirt
*	5	35	33.5	66	75			Perfect core
	6	39.5 -0.7	39 -0.7	66	76.5			Moist sod

*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.................

From notebook 18, Dec. 4, 1944

FEDERAL AND STATE

COOPERATIVE SNOW SURVEYS

State ....

Drainage Basin ....

Snow Course ....

Party ....

Date ....

*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
	7	40 -0.3	40 -0.3	66	76.5			Wet turf
	8	41 -0.3	37.5 -0.3	66	77			
	9	40	38.8	66	77	11		
	10	40.5	37.2	66	77	11		
~~Skip? Stake — 38 in.~~								
~~Small floating ice in No 8~~								
Omit	[11]	40 -3.0	37.8 -3.0	66	75.3			almost dry dirt

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FEDERAL AND STATE

COOPERATIVE SNOW SURVEYS

State ....

Drainage Basin ....

Snow Course ....

Party ....

Date ....

*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
	11	37.5 -1.0	34.5 -1.0	66	76.8			
	12	41.3	40	66	77			
	13	37.5	36.5	66	76.7			
	14	37 -0.5	36.5 -0.5	66	75.8			
av.		37.2				10.2	27.4	

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Gain in Precip.
Nov. 17 — Dec. 3/1944

	No.1*	Stevens S	No.2	No.3	No.4	No.5	Reducer
~~Nov.17~~ Nov.17	2.84	13.55	4.38	15.3	9.70	3.11	10.1
Dec.3		16.25	8.05	16.1	12.97		11.8
		2.70	4.27		3.27		
		Ice	Ice		Ice		

B&D.
~~4.605~~
6.9
7.8
0.9 = 4.5 in

	No.6	No.7	No.8*	No.9	No.10
Nov.17	9.35	12.85	8.30	13.45	13.70
Dec.3	12.43	15.65	10.74	16.55	16.90
	3.08	2.80	2.44	3.10	3.20
	Ice		Ice	Ice but rain	Ice but rain

Notebook 18, Dec. 28, 1944

8.3

~~2.1~~

18.1

From Notebook 18, Dec 30, 1944 "Stevens 5"

~~Stevens 5~~

Precip. No. 1

		in	
Dec. 3 –	16.25		
" 5 –	17.21	reached	Dec. 5–30
" 29	22.12		4.11
" 30	22.48	= 0.36	1.40
	Catch 5.27"		5.51"

Loss very small from ice bottom.

8.37

16.25
8.37
7.88

1.016
7.88
8128
8128
7112
8.00608

X
7 11.15
19.85

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State California

Drainage Basin South Yuba River

Snow Course No. 1 - Stations 9 and 10.

Party J. E. Church

Date December 30, 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
	9	46	43.5	66	79	13	28.3	
Old only		29.5	28.5	66	75.6	9.5	32.2	New snow 17.8 in. dpt.
	10	49.5	49.2	66	79	13	26.3	New snow
Old only		30.8	cc	65	74.2	11.2	36.4	20.5 in. dpt.
Total		47.8				13.0		
New Snow						2.7	*	
Old Snow						10.4		
* Precip. after rain						1.40	+	(incl. snowfall 3 in.)

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

Notebook 18, Dec. 30, 1944 "Snow Survey Test

		Dens.
No. 9	Old snow	32.2
	New Snow	21.2 %
No. 10	Old snow	36.4
	New snow	9.6 %

Notebook 18, Dec. 30, 1944

Nov. 7	0.95	
9	1.95	
10	2.0	
11	0.48	
12	0.30	
13	0.15	
26	0.32	
29	0.57	
30	0.31	
Dec. 1	1.38	
2	0.26	
" 18-22	4.11	
23	0.28	
28	0.90	
29	0.22	
		1.40
	14.18	

9)

46	13
29.5	9.5
16.5	3.5

= 21.2 % dens.

10)

49.5	13
30.8	11.2
18.7	1.8

= 9.6 % dens.

16.5) 3.50 (.2 1 2
330
200
165
350
330
935

18.7) 1.8000 (96
1683
1170
1122

Precip. December 1944

Dec 1.	1.38	11	42	
2	0.26	3	44	
~~4~~	~~0.38~~		38	
18	T	Rain	32	
19	1.30	"	30	
20	1.02	"	28	4.11
21	0.35	"	26	
22	1.44	3	28	
	Snowing			
23	0.28	1	29	
28	0.90	12	38	1.40
29	0.22	4	42	1.76
30	0.36			

~~7.15 in.~~

7.51 in

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State California
Drainage Basin South Yuba River
Snow Course Soda Springs No. 1
Party J. E. Church and Peter [illegible]
Date January 1, 1945

*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	33.6	32 App	66	74.2	8.2		Soil moist
	1a	28.5	cc	66	77.5	11.5		Snow tramped
		-0.8	-0.8					Soil moist but mealy
	2	32	32	66	74.5	8.5		
		-1.5	-1.5					
	3	—						Old snow [illegible] filled now.
	4	36.5	33.5	66	76.3	10.3		
	5	39.0	38.0	66	77	11		
	6	45	44.3	66	79.1	13.1		[illegible] [illegible] frozen soil
		-1.0	-1.0					

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†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.

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Notebook 18 Jan. 1 1945

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FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State ....
Drainage Basin ....
Snow Course ....
Party ....
Date ....

*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
	7	46.2	45.5	66	79.2	13.2		
		-0.2	-0.2					
	8	45	44	66	80	14		
		-0.6	-0.6					
	9	46	43.5	66	79	13	28.3	
	10	49.5	48.2	66	79	13	26.3	
	11	39.5	35.5	66	77	11.0		[illegible] mealy moist soil
		-1.7	-1.7					

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

- 3 -

FEDERAL AND STATE
COOPERATIVE SNOW SURVEYS

State ....
Drainage Basin ....
Snow Course ....
Party ....
Date ....

*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	48	47	66	80	14		
		-0.3	-0.3					
	13	44	43	66	78.8	12.8		
	14	43.5	37.2	66	76	10		
		-0.7	-0.7					
	13)	535.9				155.4	29.1%	
		52.0				12.0		28.6%
		41.2						[42]

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

NOTEbook 18, Jan 4, 1945

FEDERAL AND STATE

COOPERATIVE SNOW SURVEYS

State California

Drainage Basin Truckee

Snow Course Donner Lake No. 1

Party J. E. Church and Hjalmar Bergman

Date Jan. 4, 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.	25.5	25.5	66	74.8	8.8		
	2	25	cc	66	74	8.0		Frozen [illegible] 1/4 [illegible]
		-.8	-.8					
	3	25.3	25	66	74.1	8.1		Ground at snow frozen for 1/4"
		-1.2	-1.2					
	4	24	23.5	66	73.5	7.5		Soft below
	5	26.5	cc	66	74	8.0		
	6	25.5	cc	66	74	8.0		
		-.7	-.7					
	7	26	25.5	66	74	8.0		Sand dry moist mealy
		-1	-1					
	8	23	22.5	66	74.5	8.5		Snow hard
		-.7	-.7		74.11	=8.11		

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

24.6 8.11 33.0%

From Notebook 18, Jan 5, 1945

FEDERAL AND STATE

COOPERATIVE SNOW SURVEYS

State California

Drainage Basin Truckee River

Snow Course Truckee Ranger Station

Party Hjalmar Bergman and Ralph

Date January 5, 1945

*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	16	16	66	72	6.0		
		-2.5	-2.5					
	2	15	14½	66	71	5.0		
		-.5	-.5					
	3	21	20	66		7.0		
		-.75	.75		73			
	4	20.5	20	66		6.0		
		-1	-1		72			
	5	17	17	66		5.0		
					71			
	6	18	18	66		6.0		
		-.5	-.5		72			
	7	16½	16	66		5.8		
					71 8/10			
	8	16		66		4.5		
		-2	-2		70½			

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

av. 16.6 5.66 34.1%

Dr Church:

Jan 3, 1945

There has been observed at ~~the~~ the S.C.S East Lansing ~~Snow~~ Winter Hydrology Research Project a considerable difference between the maximum and minimum temperatures as recorded by the hygrothermograph at 66" level at the cultivated watersheds and the record from the thermometer at 3' level above ground.

The latter recorded lower minimums and higher maximums than the hygrothermograph.

I suggest you write to Robert L. White at East Lansing for exact data.

W. O. [illegible]

NC96/8/64

Notebooks: Soda Springs Project book 17, Nov. 7 - Dec. 2, 1944