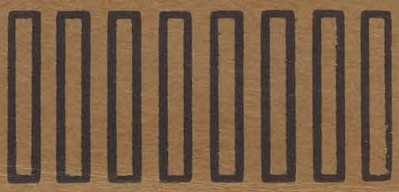
STENOGRAPHIC NOTES



No. 12

From March 15 — 1944

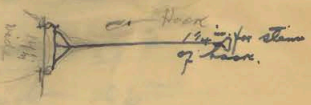
To March 31 1944

No. 26-G

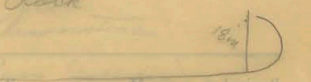
Ordered from Pierson March 15.

Toboggan -

Pole - 5 ft long over all



Runner



14½ in wide
18 in tall
4 ft 3 in long

Friday. March 17

On March 16 wrote report on Stevens #8 to Stevens, a letter of explanation to Albert Koch, and copies of reports to Office of Experiment Stations to Gerhard and Gerdel.

Stevens is planning to send a summarized Stevens 8 for test and the Ebro Power Co. promises some day to import a snow expert to outline a snow-forecast system.

Returned to Soda Springs on 8:30 am bus. Slept most of the way. My throat is worse. Gerdel had arrived at 7 pm Tues. March 14 after several futile attempts to board train or bus. Possibly the train stopped for me because I was the only one, but my only seat was a small box brought into the corridor.

Plywood for Bedroom

Length ~~66½~~ 36+32 in
Height 36+15½ = 51½ in

Length 39 in
Height 26½ in

Thermometers
Ross (tall form)

Friday, March 17

On March 16 wrote report on Stevens R to Stevens, a letter of explanation to Albert Koch, and copies of reports to Office of Experiment Stations to Bernard and Gardel.

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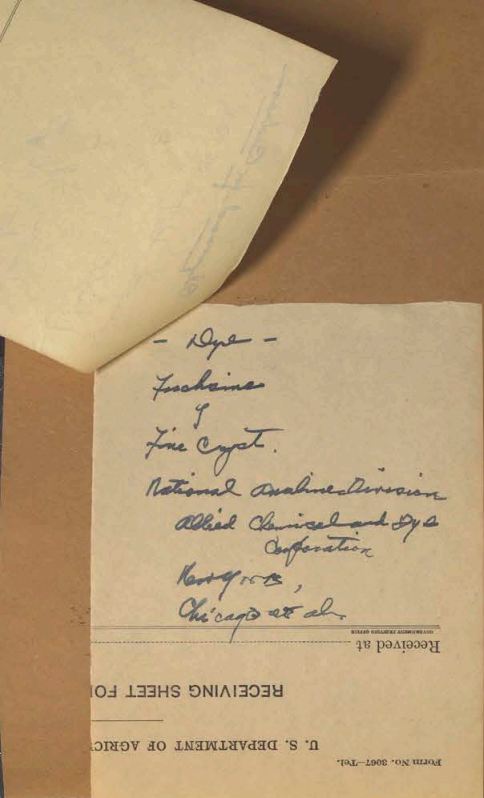
- Dye -
Fuchsine
&
Fire Crystl.
National Analine Division
Allied Chemical and Dye
Corporation
New York,
Chicago et al.

Received at

RECEIVING SHEET FOR

U. S. DEPARTMENT OF AGRICU

FORM No. 3007—Tel.

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Calorimetry

Gendel was busy trying to obtain comparable results with jugs. He wonders whether chemicals in the water were the cause.

So many variant factors that he doubted the value of attempting to read to tenths of a degree C. I had brought on loan from the Dept of Physics a thermometer 0 to 100° C divided into 0.10° for each degree, but Dr Leifson felt that if the long tube projected far above the liquid, there might be an error of several tenths of a degree.

He also doubted the high retention of heat for considerable periods and had 3 jugs of unequal heat-retention quality, one quite superior to the others.

There was the question too of the superiority of vacuum over room

wool insulation. In the former the silver prevented absorption of outside heat and the glass and vacuum prevented radiation. However, convection could assert up the inside wall & the neck unless both cork and cap are used.

Why not cover the black surface of the rock wool jug with aluminum paint? It would reduce insolation.

Loss of heat will be more rapid if the difference between inside and outside temperature is great.

— tests —

He suggested spending a half-day testing the relative retention of heat by various types of jugs. Possibly not previously done and yet easy to do.

Gendel has decided to depend on Centigrade thermometers from 0 to 100° for whole degrees, using a magnifying glass to read to tenths.

The thermometers 0-50°C are

being returned.

Snow Erosion in Cans

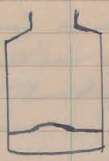
Gerdel explained the sharp cone-shaped pit in the taller cans (3ft.) as due to the narrow downward current if the wind above is strong enough to create it. Thus,

The snow is carried down but none (?) is carried up.

In the shallower cans the curve is rounder

But why, if the wind is so strong, should it not cut correspondingly deep into the can?

In broad cans or with smaller orifices, the down air current is correspondingly intense and the snow seems to dance beneath the orifice.



Snow on Oil

Since the oil is still liquid below 32°F., snow falling upon it will not be melted by it, states Gerdel, and should ride largely unchanged. unless it attains sufficient weight to thrust the oil film aside and sink to the solutions below.

The related smaller the can the less opportunity for the snow to sink. The opportunity is greatest in the larger cans with small orifices. — Watch this phenomenon.

Stevens Q - Meas.

March 9	. .	16.64 in.	(0.03 rain)
" 11	4 pm	16.64	
" 12	4:15 pm	17.12	
" 16	12 Noon	17.40	
" 17	"	17.20	

Cans Weighed and Recharged
by Gendel Thurs. Mar. 16.

The reappearance of mares tails March 15 ("a recondensation phenomenon over the snow") caused Gendel to have the precaution of reweighing the cans on Thursday, the day previous to my return.

All weighed + recharged as per attached notes 3/16/44

Q was not recharged

it still has a theoretical 6½" capacity. You decide if needs recharging. If you recharge it, leave note for me as to new "0" on chart.

Recharged wt	Stick
40	4.3
25	4.3
.25	4.3
.00	5.0
.50	6.1
6.75	4.6
4.65	4.0
5.35	4.3

from drain
... 4/16/44

$CaCl_2$.
... for recovery.

Gages recharged with 1 part $CaCl_2$ to 1½ parts H_2O + 2 g SAE 10 oil.

Weighed + Recharge 3/16/44

Rev Gendel

Nos. 9 and 10 taken to trestle to weigh. Easier than dipping pits.

Stevens Q - Keas.

March 9.	. .	16.64 in. (0.03 rise).
" 11	4pm	16.64
" 12	4:15 pm	17.12
" 16	P2 Noon	17.40
" 17	"	17.20

Cans Weighed and Recharged
by Gendel Thurs. Mar. 16.

The reappearance of mares tails March 15 (a recondensation phenomenon over the snow) caused Gendel to have the precaution of reweighing the cans on Thursday, the day previous my return.

No	wt	Stick	Recharged wt	Stick
3	—	23.2	—	—
4	16.85	15.5	5.40	4.3
6	14.55	13.4	5.25	4.3
8	13.55	12.3	5.25	4.3
9	16.23	14.2	7.00	5.0
10	16.87	14.9	8.50	6.1
R	re-set		16.75	4.6
* P	16.64	16.3	4.65	4.0
PC	15.54	14.4	5.35	4.3
W_5	10.46"			

New Stevens can has been leaking from drain Cap in bottom. Tightened up Cap 4/16/64 wt. 9.80, depth 5.6

* P (prestone gage) recharged with $CaCl_2$. Prestone brought to building for recovery.

Gages recharged with 1 part $CaCl_2$ to 1½ parts H_2O + 2g SAE 10 o.l.

Weighed + Recharge 3/16/64
Glen Gendel

Nos. 9 and 10 taken to trestle to weigh. Easier than slipping pits.

Tucker Sno-Cat and Thompson Snow Mo

Major Morris, a friend of Gerdels and inspector of , is due in Sacramento next week and if he has the time, Gerdel will contact Tucker at Grass Valley regarding a demonstration of the Sno-Cat at Soda Springs.

Thompson's Sno-Motor built for the Cedars near Soda Springs (the original 15 mi. south of railway) is gleamed before our door.

It has the slimness and length and outrigger skis of Tucker's Spiral Drive and its long surf-board guide with a narrow single caterpillar drive.

It is home-made with much welding. It can not reverse for lack of turn-up to the rear of the skis. It appears structually weak tho it stands high in the snow.

a broken or faulty welding stopped it at the start of its journey to Cedars.

Leases

A copy of the lease of rights in the pasture has been given to Dennis Jones. He already has a copy of the lease of the Headquarters rooms.

Copies of both have been placed in the files of the Headquarters.

Paid James also $4.39 for 12 qts No 10 Triton motor oil for cars.

Gendel Leaves - Becky's Family Comes

On the 4:40 bus. Food in abundance and for trade.

Gendel is saving gas for the Easter trip for his family.

Saturday March 18 -

Wind Channels

The wind channels on Beacon Hill still dominate the ski tracks. So another photo was taken.

But the ascending air drainage like a reversed stream (of water or sliding snow) on Mt Donner was so unmistakable yesterday morning that

I called Ernie Maes by long distance to come up tomorrow & photograph it.

I asked him also to photograph Mount Rose ~~[illegible]~~ in the avenue of pine trees on the highway below Donner Lake & near where I wish Frances' and my ashes placed, as the last act of our lives.

Stevens N moves

At 10:45 am. Wed 16 the sun moved after Gerdel had marked the date on the sheet. Since the mon. was only 48°F, could the sun have shined into the instrument from the SE after the door was opened? He believes that he did not touch the bar. → He could test the sun's effect easily.

Photos for Cincinnati

Becky posed us all at and with snow instruments for an article

on 6 Peaks and Western Snow.

Snow Survey

To test Erosion on Ground and in Cans

Snow survey data sheets (3) for Mar. 18, 1944
to folder

Snow Crust

7:30 pm

Min. (current)	44°F.
H-T	45°
Tetethermo.	44.8°F

Crust had already formed.

Sunday, March 19

Sports?

Marshall broke a ski yesterday in a drift of new snow. Square break. Mystery that his uncle also was not broken.

In the evening on the dam the toboggan threw them all onto the hard snow and injured his vocal. So he is taking today easy.

Ernie Mack

At noon Ernie Mack arrived. Found the wind channels on Danner Peak. Took a score 17 views.

Too much haze for Mount Rose view

Read:

Weather Posts in Greenland recently in Sat. Eve. Post.

but will [illegible] it on way home. Will detour to Tahoe.

Berry and family returned with him. Due in Reno at 5 p.m.

Stevens W

Tested by Ernie. Motor has 22 volts. Heating unit wholly dead. 0.

In testing his wrist bore down on the base of the weighing rod. Rem has consequently moved considerably forward.

→ Once the motor seemed to run when his hand did not touch it, but only for a moment. Could the direct sun have affected the metal. Must test this.

Dye and Melting

a sample was taken of Fuchsine placed on the snow at the Filling Station approximately March 12 or a week ago. (really March 11)

The snow has settled but the dye has not penetrated on the present cover more than 6-12 in.

but to this depth is concentrated, i.e. the snow is dye-soaked. The core below is pure white.

The upper core was water-soaked, the white core packed dry. Dye on this core was inert except on the surface crystals - Were these warmed by the friction of cutting by the sampler? (I shaded them with my body.) This was true of both fine and coarse crystals.

The color turned green again when in shade and freezing started.

Cut another sample and placed dye near bottom. Inert. Core frozen or crushed under pressure.

→ Cut samples in the morning and afternoon. Test for packing vs crushing.

Try temp. in snow morning and afternoon. Could thermograph reveal a tendency of movement? Calibrate thermograph.

Temp. with Elevation (?); Crusts.

5:30 pm. Telethermoscope 43.1°F
Current min. Hotel 37.0
H-T " 36.5

Crust in sun 1/4 in. (Semplica)
" " shade 1 in. "

7:30 pm. Telethermoscope 33.8°F
Current min. Hotel 31.0°
H-T " 30.5°

Crust (8:30 pm) 2 1/4 in. thick.
" 8:30 am. (Mar. 20) 8 in. thick. to melt depth
Min. temp. 17°F.

Monday, March 20

Dye, Temperature, Melting
Temp.

7 am. approx.
Telethermoscope 13.8°F.
Strong E wind.
Min. Hotel 17.0°; H-T 16.5°

8:15 am. Telethermo 16.8°F
Current Min. (Hotel) 21.0

9 am.
Temp. on snow 17.6°F
Tichathermo. 19.0

9:15 am
In sun back of Hotel 39°F
Snow crystals just beginning to moisten

→ Temp. in snow 3 ft deep or less
Two meas. 31°F.

9:30 am. (a) 30.8°F ; (b) 31.5°F

Planted thermo - 2°F each graduation
(a) 36 in. deep
(b) 72 in. deep.

?

Myers

8:15 Planted Tuckime in sun back of Hotel and on saloon steps tipped toward sun.

9:15. In sun back of Hotel 39°F.
Snow crystals just beginning to moisten.
Tho tipped up toward sun

on stone steps, dye is still green, lixenines on the coarse crystals.

9:45 a.m.
On level behind Hotel
Dye still green. Temp. in sun 48°F.

But tilted on steps red. Temp. only approx. 46°F. (Case in way)
Crystals slightly moist to hand.
Color deep. Water deep in granulated ice.

→ Sun rose at 45°. Morning half gone.

10:30 a.m.
Telethermometer. 25°F.

All dyes in sun turning red. The deeper the dye, the quicker its change. Is it warmer from the wind? Top still green but the dye on the surface is thicker.

→ Take color views of dye movement.

12:40 p.m. Telethermometer. 28.5°F.

→ * Is the sealed tube greenhouse in effect?

Cores

In the long cores left on snow, the color (dye) portions are bare shells. Due to opaque dye radiating sun? The white part is dry and hard. Refreezing.

The fine snow is not weathered as compared with the coarsely crystalline. Slower to break down.

Photos in Color

Need not only color stills but also color movies of dye penetrating the snow. Most impressive even as means of study.

Freezing and Thawing

Core placed on porch last night frozen solid tho melted by the boards somewhat last evening. Purple dye still on boards.

Crust 8 in. thick. Mealy snow below. Froze to depth of melting yesterday. 8:30 a.m. cold, E. gale. Fuchsine settled in porous snow. Tho in sun, yet no change in color.

→ Cores cut entire depth crust dry three samples.

Planted 2 therms. at 36 in and 72 in to determine temp. and change in texture during day. Temp. this morn 30.8 & 31.5°F. or below freezing.

Coarse, loose, mealy crystals in the path at Ski Hut yesterday cohere this morning.

Calorimetry

Retention of Heat by Rock Wool.
Test in cold ambient temperature

	Hot Water	Temp. of air.
11:15 a.m.	79°C	33°F
11:30 a.m.	75.5°C	
12:00 noon	71.8°C	36°F
12:30 p.m.	68.0°C	38°F

Metal outer case becomes cold in air but warms up soon after the hot water contents are shaken.

Nearly a quart of hot water was used. Only a pint can be used when melting snow. So change should be more rapid with a smaller amount, but really less rapid with a low temperature due to the snow.

→ Now test a vacuum jar, but paint the Rock Wool Jug with aluminum paint to prevent absorption of heat.

Mean of Temp. at Heights

4 pm. Botany thermograph prepared for exposure on snow at base of Hotel platform.

Adjustment screws off. So reset the pen and then set the screws for fine adjustment.

In Shelter	Thm. (current)	33°F
	H-T	32°F
On the snow		
	Thermog.	31°F
	Sealed tube	27.5°F

Wind fresh. E.

5:50 pm.

	Thm. (current)	32.5°F
	H-T	32.0°F
On snow		
	Thermog.	30°F
	Sealed tube	25°F
apparent	Teletherm.	31°F

Air mixed. Still inversion occurring. but, Temp. of freezing 35° rather than 42°F.

→ Get climatic data by Temp. at usual height of shelters and number of hours of melting per day.

Crusts

Today crust had formed before 4 pm. at approx. 35°F. and had barely started to melt at 10:30 am., a period of less than 6 hours and really less than 5, and only superficial.

In the Pasture practically no melting on the level. Even from yesterday crust was only 1-1½ in. thick.

On the upturned slopes at the Hotel, the depth varied.

→ Color back of Hotel has sunk 8? in. See crust in the morning. On the Hotel step the snow had mainly disappeared and the color was on the stone.

Temperature and Moisture of Snow Cover

This morning temp. 30.8°F to 31.5°F.

{ This evening East upper hole 31½°F. (6 ft. deep Deeper?)
{ " " W and lower " 32°F (3 ft. deep?)

→ The temp. appears to have risen during the day.

Newly-cut Core:
Top 15 in. packs moist;
Center crushes;
Bottom packs dry.

#

Test by dye:
On 2 ft core:
(a) Coarse crystal top red at once.
(b) The dry pack took no color.
(c) The moist pack had flecks of color.

Dye on "Snow Spray".
Color not on top but in porous structure underneath, where the cold wind is cut out and the sun's heat has concentrated. The color seems to travel like prairie fire.
→ Notice this in morning.

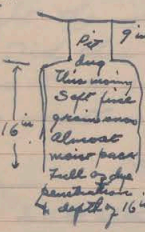
Weather
In Pasture. 5pm.
anemometer 24.5 mi.
Snow stake 66 in. in hole; 70 in. for field.

Tuesday, March 21

Night Temps,
Teletherm. in night 22°F
7:40 am 19.6°
8:30 am 22.8°
Sealed therm. on snow
8 am -21.5°F ; Therm. rising. Placed in shelter.

Crusts

Cases of Hotel Stairs (a) Dye planted yesterday 8:30 am.



Dye red not blue but snow when thrown out froze hard and the new dye placed on it remains green.
→ Here the moist snow did not freeze Too deep? Too dry? Temp. travels too slow

Core sticks in snow sampler?
Is sampler too warm and is chilled by frost in snow and adheres?
Shellacked it and had no further trouble.

(b) New Hole near by.
Crust but fine loose snow below.
Passes dry - Dye put in hole remains green.

Query: Loose snow of yesterday
→ was moist and did not freeze during night. One case of moist snow over night tho no percolation.
→ Did this snow percolate yesterday or is it a case of quick spread in moist new or fine snow?

Melting

9:45 am.

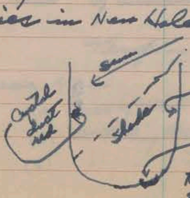
In Hotel Shelter

Thermog. 23°F - Readjust this instr.
H-T 26°
Min. 27° (correct)
Telethermo. 27.8°
Min. for night ?

On snow dye still green. Likewise in hole on soft loose snow.

11 am

Dye now red on surface.
Varies in New Hole:



Note - Earth on snow in snow mixed. Radiation or heat with melting?

* By mid afternoon when the sun was most nearly flooding the hole, the remaining flecks of green dye on the still shady side had become red.

12 Noon -

Sun higher. Now hole more flooded with light the back wall is in shadow. The color is much more active but the tiny flecks of dust on shaded wall, (higher than bottom) are still green *

Temp. in Snow

At filling Station last night both therms. 32°F but not much deeper than 2 feet.

Reflected Therms.

(a) Back of Hotel 9 am. at 36 in.
at Filling Station 10 am
(b) Upper E at 56 in.
(c) Lower W at 36 in.

Photographs

3 views of Thompson's Snow Water
1 view of Interior of Steven's Q.

Temp. in Snow

Approx. 4 pm.

(a) Back of Hotel 32°F
(b) at Filling Station 32.2°F or more (?) *
(c) " " " 32.0 full.

* Core cut for study:
Total 54 in.
Upper 24 in. pans moist.
Middle crushes
Bottom 6 in pans moist.
Query: Is there ground temperature effect here? Gendel suggests instrumental error.

Stevens S

Board dry but can wipe drops from the cap.
Gendel will try a gasket of rawhide.

Stevens Q

Marked sheet "March 21, 11:30 am". Should have been "12 Noon". My watch had stopped, tho heavily wound last night — a \$5.00 watch after 40 years!

Melting

New Hole back of Hotel

Total depth of snow cover 54 in.
Hole approx. 12-14 in. deep. From bottom of hole to ground 39.5 in.
Dye concentrated for 5 in.
Traces of dye for a total of 18 in.

Old Hole back of Hotel

In old hole from surface of snow cover down during yesterday and today, dye had penetrated approx. 26 in.

Crust

4:30 pm. In the shade crust is forming. Temp. in shade in shelter now 36°F.

In the sun crust is difficult to detect for the "snow spray" is still frozen and the old snow beneath seems still soft. It is probably protected by the "spray or window pane" covering from wind and air above i.e. from excessive radiation

Temp. with Elevation

5:15 pm.

Telethermom.	40°F
Sealed therm. on snow (in shade)	30°F
Thermog. on snow (2 in. above surface)	33°F.
H.T. (in shelter)	36°F
Current. min.	37°

At approx. 8 pm dark - Snow is frozen firm.

Record Sheets on Hand

H-T No. 1074C
+90° to -20°F . . . 26

H-T No. 1074 B
+110° to 10°F . . . 26

Friez Recon. Gage — Entire box.

Barograph — 8
Sheets without inches
preferred
Have 4 more additional box. entire year supply

Stevens Q — 2
Possibly 1 in Pasture

Thermograph - Dept of Botany — 27

Small Thermog. 0 to 100°F — 1 Box

Triple Register — 1½ pages

→ Need green ink.

Return mimeograph and washers to Harden.

Wednesday, March 22

Temp. with Elevation

7:10 am.*

Reany Station – Teletherm. 31°F

Shelter back of Hotel { Min. (current) in Shelter 26°F
{ H-T " " 24°

On Snow Surface
(a) 2 in. up but metal Thermog. 19°
(b) In sealed tube 16.2°

Sun not yet up.

Crust brittle and hard like glass. Easier to walk where "sword-points" are smaller and closer together. Pasture is far smoother.

Test of Sealed Thermometers

1. One completely sealed
2. One with end of tube open.
3. One ventilated throat.
4. An exposed thermometer as standard.

* 7:20 am. Teletherm, 29.4°F.
Query: Did the H-T fall lower or was it at its minimum at 7:10 am?

Thursday, March 23 -

Obtained a red ski jacket (not pants) No. 20 for Mrs Gendel on trial.

The other print paper has arrived but heard of it too late. Marshall may bring it up.

Got some kitchen ware.

The tongue and crate for the toboggan is being shipped to Soda Springs by Fred Pierson today.

Bringing office ware with me.

Friday, March 24

Insolation at Donner

Ice at the foot of Donner Lake now loose from the shore.

→ Snow hoods on bathhouses differ in melting rates for insolation varies because of the trees. Take a series of pictures next winter

Gendel Gone

Felt lonely but he left my roast beef for lunch.

He also has suffered ski-break. Left yesterday because Major Morris had advanced his plans.

Reset Instruments

The two H-H's with determination of relative humidity, barograph, and frig.

Inspected Stevens Q and W. Normal. All liquid where inspected is unfrozen.

But Stevens S is still leaving and No. 6 is wet at bottom of can.

→ Must weigh latter to determine possible loss.

Jack Eddy

Jack Eddy called. I thought him Senator Friedhoff at first.

Inspecting the Yuba water. Jordan can hold 5200 acrefeet. Not yet half full.* Only the lower South Yuba is running yet. The lower snow by Spaulding is disappearing. The snowline is retreating rapidly along the highway almost several miles a day.

Oakland has called for reports. Always depend on the snow survey. Satisfied with 80% of normal.

Always try to so draw upon lake Spalding that at the end of the runoff season it will be completely full for autumn draft.

The P.G.&E. also glad to send representatives like Blair Eddy to the snow conferences.

* In driest year, the watershed according to Ed Rowing can be filled three times, i.e. will provide 15000 acrefeet.

Snow Stake

at a glance 60 in.; Arthur 62 in.

Temp. Meas.

Rel. Humid.

Hotel Wet 31.2°F
Dry 40.2

Pasture Wet 31.6°F
Dry 41.0

Max. for week 55.0°F Rest 43.0°
Min. " " 13.9°F " 42.5°

Equipment

Tightened tarpieces of webs.
Shellacked snow sampler.

Snow Melt

At 10:30 a.m. the snow surface was moist in the sun but still frozen in the shade even at noon. At 5 p.m. the top points of the snow surface in the shade where frozen and dry and at 8:30 the snow was firm and brittle.

Beneath the surface the snow continued soft and has been

moist throat.

Temperatures with Elevation

5 pm. Teletherm. 44.6°F
Min. (current) 42.0
H-T 42.0
On Snow
Thermog. 38.0
Sealed therm. 38.0
In shade on snow. Tips of snow freezing.

5:40 pm. Teletherm 43.9°F * Sun almost touches its tip
Min. 41.3
H-T 40.0
On snow
Thermog. 38.0
Sealed 35.0

Rearranged:

	5 pm.	5:40 pm	6:50 pm
Teletherm.	44.6°F	43.9°F	41.0°F
Current Min	42.0	41.3	40.0
H-T	42.0	40.0	38.0
On snow			
Thermog.	38.0	38.0	36.0
Sealed therm.	38.0	35.0	32.3

Temp. in Snow

5 pm 4 in. down . . . 32.2°F
7 in. " 32.0
46 in. " near bottom 32.1 or 2

↓ Test sealed therm. in an snow or ice bath

Crystals 2+ in. down even in shade turn red - even their tips.

At the surface the tips do not change their color tho the crystals immediately below become red — an evidence of the earlier freezing where in contact with that air and therefore exposed to rapid radiation and evaporation.

The diurnal shift where the snow is relatively shallow is shown by the dominating 32°F in the body of the snow and by the possibly higher temperature of 32.2°F at bottom at subsurface where earth and sun heat are slightly effective and by the rapid fall of temperature near or at the surface of the snow at sunset as shown by the sealed thermometer buried half its diameter in the snow.

The crust forms even in advance of 32°F. immediately upon the surface.

Could a sealed thermometer immersed slightly deeper in the surface detect the radiation temperature that produces the freezing?

Temperatures and Dye

The dye in the old and new holes set Tues. Mar. 21 has penetrated the entire snow cover, indicating that the snow cover has now been penetrated by melt water.

From the old hole, the core crumbled and proved moist thruout its length. Dye placed on it turned red superficially but the color was not transmitted to other crystals beneath the surface, indicating that water was no longer percolating and that the core even there was congealing in the evening air.

At 24 in. depth the crystals were found coarse from earlier weathering and still so moist that dye placed in the pit, tho in shade, quickly

turned red even on the surface crystals that would be first to congeal in the night air, thus indicating that the entire body of the snow was still moist.

On the top of the snow, the dye remained green on the tips of crystals already congealed but changed to red in the tiny interstices beneath where the snow still remained warm.

In the new pit, several borings indicated that the dye had spread a yard or more some deviously in reaching the bottom.

→ Seek more fine-grained snow for testing the capillarity of water vs gravity in it.

Snow Survey

→ Make a snow survey tomorrow to determine possible loss of water.

Saturday, March 25

Temperatures at Elevations

6 a.m.

Telethermoscope . . . 27.4°F

Min. H-T 24°F; Min. Pasture 22°F.

7:30 a.m. Telethermo. . . . 30.0°F

Current min. 37°; Column Broken

Repaired later.

H-T . . . 29.0°F

On Snow

Thermog. . . 24.0°

Sealed therm. 26.0°

Opaque frost over thermog. and sealed tube on snow.

→ Frost also on cans, but most on plastic collar and least inside Reduced Can below collar.

7:45 a.m.

Telethermo . . . 31°F?

H-T 30°

On snow

Thermog. . . 24.5°

Sealed . . 26.8°

½ in. beneath snow 28.0°

Temperature on Snow

1. The old cores of yesterday are all purple as well as the dye in the bottom of yesterdays test hole where the dye turned red after sunset showing moisture still impregnated.

2. In a new 40 in. core from the snow cover (a) there was no change whatever from green to red when sprinkled with dye.

However, where I had leaned on the surface of the snow cover there was a flush of red due to melting from pressure.

(b) But the lower part of the core crust packs the the upper part crumbles, indicating that the cold had not penetrated effectively the entire depth of the snow.

(c) Penetration of Cold. - By color -

Hard crust 7-8 in. but

crumbly below. The min. air temp. of the night on the snow was 19.2° F for 8 hours.

(d) Presence of improper moisture as shown by dye in snow cover rather than on cones exposed to air temps. below freezing.

4 in. - Dye hole at 4 in. depth - Green

10 in. - at lower limit of hard crust:
Slight tendency to red but only on one point 1/50 part in area of the dye.

10 in. at another pit in coarser crystals. Snow varied from red to more flush to green. Transitional zone.

15 in. Mostly green but a tendency to flush

23 in. Dye turns red immediately.

29 in. " " " "

The last 2 feet therefore were ready for immediate melting the

the crystals were firm and percolation, if any, had ceased.

(e) The temp. ~~in~~ within the snow cover was at 32°F. or approximate melting.

By sealed thermo.

2 feet deep 32°F
3 feet deep 32°F.

Compare latter with 32°F in body of the snow last evening and possibly 32.2°F at bottom of the snow.

approx. 9:30 am Temp. in Shade

H-T 31.5°F

On Snow

Thermog. 29.0°F
Sealed 33.5°F

At 10 am. Dye and Melting

All gitte dyes - old and new - were brilliant red. The steam clouds had broken and the sun by direct insolation had started active melting. This was true even in the temperature and dye pits of this morning into which

the sun's rays shone with considerable effect.

→ The snow thermog. was removed to the shelter but by its sudden rise shows the dominance of the sun.

Testing Sealed Thermometers

Seven sealed thermometers were tested in a large bucket of snow and ice saturated water.

After much stirring and loading the bucket with snow and ice to produce a concentrated mixture, all thermometers after repeated tests finally read 32°F or in case of centigrade 0°C., even the thermometer with broken column of 0.2°F reading 32.2°F.

The standard unsealed thermometer over the triple register responded 32°F promptly. The others more slowly because of the air insulation about them.

In the case of three, the column wavered at −0.1 to +0.1°C or 31.9°F

Tests of Thermometers

Original Three (used before the others this season)

No. 1 32.2, 32.0°F

No. 2 32.0, 31.9, 32.0°F

No. 3 31.9, 32.0°F.

No. 4 32.2°F (Broken column)
Corr. —0.2°F.

No. 5 32.2, 32.0°F

No. 6 32.0°F

No. 7 —0.2°C, 0.0°C

and 32.2°F but when dipped into the most concentrated part of the bath, ever they recorded 32.0°F.

Apparently, therefore, the readings thus far made should be accepted instrumentally but are still subject to the human error.

Dyes in Pasture

Earlier studies of melting have been made at the Hotel where because of slope melting is more rapid.

At 12:30 pm. dye was planted east of bottle.

The snow cover was still firm but beginning to become moist. The dye therefore became red immediately. The rate of descent will be observed.

Snow Survey data sheets (3) for Mar. 25, 1944 to folder

Snow Survey

See binder →

Summary. Summary of Snow Surveys for March

	Depth	Water Equiv.	Dens.
March 1 (Eddy)	101.7	27.3	26.8
" 10 (Church + Kendall)	85.9	29.9 *	34.8
" 18 (JEC) after erosion	73.0	29.0 **	39.7
" 25 (JEC)	63.8	26.4	41.4
Apr. 2 (JEC)		23.8	46.6

* Precip. Stevens W 3.72 in.; No. 1 3.82 - 0.81 Weds.
Increase by survey 2.6 in.

** Precip. Mar. 10-18 . . 0.81-0.02?
Loss by erosion . . 1.71 in.?
See views of erosion channels.
→ Is loss as great at Summit which is forest protected?

Dyes in Pasture

Snow survey data sheet "Dyes", no. date to folder

Temp. with Elevation and Freezing

4 pm.
Telethermo. 43.9°F
Current min. 37.0 F
On Snow
Thermog. 33° F

5:30 pm. Crust forming in Pasture.
already 1/16 in. thick.
Length of melting day approx. 7 hrs.

6:40 pm. Coming from Pasture
Coarse corn snow in beaten trail now crunches under foot.
Telethermo. . . . 44.9°F
Current min. 31.2°
H-T 34.0°
On Snow
Thermog. 30.0°F
Sealed therm. just set out.

8:20 pm. Telethermo. 30.9°F
Current min. 28.0+°
H-T . . 27.5°
On Snow Thermog. 19.5°!
Sealed 1 in. deep in open ground in snow 17.5°!
8:30 pm. Telethermo. . . 29.4°F

Crust

How deep will the crust freeze tonight? already almost as cold as last night. Snow in Pasture colder at bottom than at Hotel last night.

→ Take temps in snow.
also test sealed thermo. with semicap and fully exposed thermometers.

No. 6. Can leave?

Wt Mch 25 4:30pm. 5.25" (16.25)^{lbs} or 5.245^{in}.

→ No; Gerdel's last wt was 5.25^{in}.

Sunday, March 26

Temps.

Hotel 2 am.

Teletherm . . . 20.5°F

8 am Teletherm . . . 19.6°F

Current min 10.6°F

H-T . . . 14.0°F

Min. H-T 8.5°F

On Snow

Thermog. (in cm) 15.0°F

Min 4.0°F

Sealed (in shaded ground in snow) 7.5°F

Pasture

Temp.

9:45 a.m.

Current min. 29°F

H-T 28°

Min. 7°F Min. on snow?

Crust - 11 in. deep.

Depth of percolation yesterday 17½ - 26"

Query: Crust depth in proportion to the drop in temperature?

Back of Hotel crust is 10 in.

Min. on snow 4°F.

Note H-T (Hotel) min 8.5°F; Pasture 7.5°F.

Melting

At 9:45 am old dye upturned to sun. Sun → Hole is red but in shaded side of hole is still green.

New dye placed flat on snow is changing only very slowly.

Snow Texture and Dye

11 am Snow depth 66 in.

Two cores cut.

Crushed only: First Core crushed passed through; in fact two or three frozen strata in snow forced up and down chisel* driving it to penetrate the ice.

Mainly green: Second Core (tested for color) showed red at only one or two points where the dye followed tiny ice water veins. *Next page.

The chief zone was 1½ in. deep at 18 in. below surface. The other faint (lower) has now faded out. 18 in. is below present crust but above deepest percolation of yesterday.

The top and bottom of core are still green.

No effect: But the snow on which the core has been laid is already colored in its porous surface to depth of 1-1½ in. where sun has penetrated ice into a hot house and its rays are protected against the movement of the air.

Insolation: The path & Hotel where covered with soot and soil is wet while the entrance & the porch of Headquarters still in shadow is still brittle and hard.

The sun has been active since 9 a.m. (?)

* NB. - At 11:40 a.m. since the sun has become effective in the core, the snow has become scarlet.

Snow Melt Project

Early morning and evening; (a) take temp. in snow; (b) test packing and crushing, moist and dry; (c) apply dye; (d) determine calories on various types of snow.

Two centers: Soda Springs and Donner Lake Hotel, where temp. and melting must vary with altitude.

Study insolation on both homes in various exposures at Donner during the winter and spring.

study crystal size, relative density, and percolation as related to each other.

Make climatic record of hours of beginning of melting and freezing with temperature at 5 ft. or normal height of instrument shelter and length of daily melting period.

Melting Mch 18-25

5:15 pm.

The loss of 2.6 in. water from the snow cover in the Pasture from March 18 to March 25 is attested by the water running over the trench at the Railway Station from the snow uplifted to the sun.

altho the precip. during March 1-13 was 3.61 in or the full 8% of normal expected for the entire month, no precipitation had occurred for 12 days leaving the snow surface to be deeply weathered (called "spring") with overload of melt water on the

snow beneath.

However, the density of the snow increased only from 39.7 to 41.4% — the density of ripeness but not excessive.

what is the normal?

The temperature, average or mean of the period 18–25 was only 35.2°F.

normal?

Max. yesterday 40°F, today 42°F.

We seem to be having water loss during March because of lack of insulating new snow. This is the third known occurrence of premature melting at Donner Pass.

Snow Cores in Pasture

North Set

No. 1 Set Mar. 25 (yesterday) Depth 65.5 in.

Dye in two melt days has reached bottom. By way of sampler hole cut last evening? or by natural percolation?

Bottom of core crushes packed, one button of ice.

Top inch crushes dry.

→ Tho still frozen, the refractory ice strata of this morning are practically gone.

No. 1a Set today. 63.5 in.

Dye has penetrated (one melting day) approx. 12 in.

Upper 1/2 packs, remainder crushes packed ("crush-packs"). One ice button.

→ Sample again tomorrow.

South Set

No. 2 Set March 25 (yesterday). Dpt. 61 in

Dye in two melting days has devinously reached to within 4 in. of the bottom.

→ Excavate tomorrow.

No. 2a Set Today. Depth 62 in.

Dye in one day has penetrated 16 in.

Depository crust at 36 in.

The portion of the core (upper) penetrated by dye crush-packs easily.

The next 10 in. crush-packs reluctantly.

Last 36 in. crushes dry with numerous

frozen buttons (ice strata in the core).

The surface of the snow in the Pasture is not badly weathered. The "spray" is result of rapid melting (?).

Insolation Depths

The following opaque objects were found in the event:

a tiny cone at 3 in. depth,
a small piece of bark at 4 in.
a twig ⌒ at 6 in. (unusually deep for its diameter.

Weathering of Marinja Test Cores

1. The core crush-packed by hand is still a series of smooth packed ○○○ sections of snow.

2. The core sprinkled with dye is merely a series of shells of ice-glaze with the contents of the original core in fragments.

→ Take a view of both in the morning.

Maximum Temps.

Relatively low for two days:
yesterday 40°F, today 42°F.
Snow stakes . . . 61 to 63 in.

Formation of Crusts

5 pm. at Hotel, crust formed in shade

5:15 pm. in Pasture, crust forming in sh
Current min. 38° F
H-T . . . 40°

6 pm. The surface of the snow in the sun is now freezing — both on the blackened trail and on the level surface. The corn snow in the trail is hard the not yet congealed into a solid mass.

→ The sun is 15° above the horizon. How high must the sun be in the morning to restart the melting? Today started at 10 am, stopped at 4 pm — a 7 hour day but late in starting and quick in stopping. Really 9 am to 4 pm. by sun time.

Temp. above, Am, and in Snow

6 pm. Taletherm . . . 44.8° F
H-T . . . 40.0°
Thermog. in shelter 40.0°

Thermog. and several thermometers now being set out and in snow.

6 pm.

Teletherm. . . 43.4°F

X-T . . . 37.0°

Min. defective

On Snow

Thermog. (in shelter cage) 34.0°

Open thermom. (in cage) 32.0°, soon 30.8°

Therm. No 1 Sealed in open channel in snow 28.2°

Crystals frozen at few points

28 tube

In Snow

Therm. No. 4 Sealed 1 in. beneath 32.0° [Con 31.8]

" " Sealed 3½ in. beneath 32.1° & 32.2°

→ Tomorrow go deeper.

How deep will temps of 32° be found?

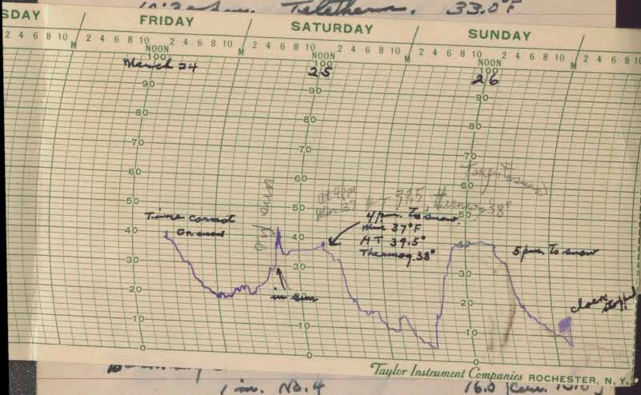
Is seems to appear also at bottom.

→ What caused the refrozen crusts to disappear today in the Pattens? There were none yesterday, but they reappeared after a cold night (min. 7°) and mainly released under a max. temp. of 42°F. The percolation of today's rain was less than a foot! Is there a conduction of heat, accelerated by higher density?

Monday March 27

Temp. Air and Snow

10:30 a.m. Telethermo. 33.0°F



1 in. No. 4 16.0 [Corr. 16.0]

3/4 in No. 6 19.0°

→ Tonight place thermometers at more places and deeper.

Pasture Strong east wind. Current temp. 26°F

Hyde

9:30 a.m.

at No. 1c and No. 2c.

No change.

9:50 a.m. No. 1c starting red.

No. 2c dormant

but No. 2b where slope is tipped

Stem is bright red.

Even after 10 a.m. 2c remains dormant

Crust

Last night's crust is 12 in. deep.

H-T min. last night 8.5°F

Current temp. 26°F

Snow Cover

New core 62 in. Early morning

→ Crushes dry like salt except a few (Practically no refractory crusts)

bottoms of agglomerated frozen ice crystals.

→ Bottom very dry.

Bulk in No. 1c snow mealy sliding with tendency to pack and No. 2c bottom fist packs soft.

Retest of Nos 1a and 2a. shows some tendency to moisture and pack.

No. 1a. Shoveled out for 2 ft. depth. Red found 28in down only. Samplings revealed only white deposit. → Snow midway mealy but packed slightly. Temperature ?

No. 2a. Borings only. Red found 12in. above ground but in another sample red was found at bottom.

Bottom feet packed soft. Remainder crumbles dry.

Pictures

Two views of desiccated cores (a) ice shells (b) packed "hamburgers".

Crusts

5 pm. Hatfield -
Temp. 36°F approx.
Crust forming in shade.

5:30 pm
Crust forming in sun.
angle of sun 15° above horizon.

Pasture

6 pm. Max. today N.T 33°F
Min. last night N.T 9°F
Min. since Friday last 5.6°F
Snow stake 61-63 in.
Anemom. dial 24 mi.

Cores

Run cores (a) 61 in.
(a) Crushes dry except 2 in at 16 in. depth. There merely a tendency to pack. 3 or 4 buttons of agglomerated ice crystals 1/4 - 1/2 in thick.
(b) 61 in. Surface remains green in shade - bottom to top.
Also green when in sun 15° or less. at present temperature

Study 1° and 2° in morning.

Temps.

Teletherm. . . . 45.8°F In sun

H-T 32.0°F

snow

Thermog. . . . 28°F

Exposed . . . 26°

Sealed (in groove) 24°

Teletherm 29.3°F

Min. 21.5°? Still defective?

H-T . . 28°

In snow

Thermog. . . 24°

Exposed 23°

Sealed (in groove) 20°

Temp in Snow in Pasture

, in. at bottom of snow 32°F approx

Could^nt draw out plug. Brace

ing. Had to dig. Shoveled off

upper end of tube.

Must fasten waste to stick or

a spiral wire to penetrate waste

& bring it up

Tuesday, March 28

Tempa

7:30 a.m. Sun just reaching meter on mast.

Cold east wind.

	Teletherm. . .	25.3°F
	Min. 18°F (?)	
	H – T . .	26.0°
	On snow	
	Thermog. . .	22.0°
	Exposed therm.	22.0°
(No. 1)	Sealed (in channel)	22.0°
	In snow	
(No 6.)	2 in. deep . .	22.0°
(No. 4.)	7 in. " . .	28.0° [= 27.8°F] Burnes Column Corr. = 0.03°
(No. 3)	8 in. [4-8 in.] . . .	29.5°
(No. 2)	41 in. deep . . .	31.8°

Broke No. 4 in pulling it out. Frozen in.

Crust 12 in. deep [thick]

Snow Melting

11:00 a.m.

Hotel.

Minimum for night H-T 25°F

Min. therm. 16.0? Still defective.

"Camilland ordered new one by wire last night".

Min. on snow (thermog.) 21°F

Snow in sun soft 1 in.

Snow in shade still frozen.

11:15 a.m.

Pasture

H-T . . . 35.0°F (Current)

[Min. 10pm - 8am 28 to 25°F]

Min. (Current) 35.0°F

Penetration of dyes

Station 1a. Not remeasured. Cut up.

1b. Core 59 in. Dye 23 in. down

Top and bottom crush-pack.

Middle packs slightly more.

Dye continues red with depth.

1c. Dye penetrated 14 in.
1c. second drive " 14 in.

Extra - 15/x. NE 61 in. Dye 21 in.

Station 2.

2a In midst of 4 holes. Dye 50 in. down

2b 60 in from bottom of hole. Dye found 7 in. from bottom. or 53 in. down.

Strata red 7 in. and 14 in. above bottom. The whole area red from top to 18 in. down.

2c 60 in. from bottom of hole. Dye has penetrated 16 in.

12:15 pm
→ Set dye at 1d and 2d.

New Core in Shade

Dpth 66 in.

Upper foot crushes.

Remainder crush-packs, the bottom packing slightly more readily. Try tomorrow at dawn.

Enigmas?

1. "The temp. of the top of the snow is well below freezing, the bottom foot is 28.5°F, midway probably 32°F." Yet the dye shows percolation of 50 in. during two days.

Can water flow thru freezing snow unless via fissures?

2. The red dye turns purple when frozen as on surface. Why is dye today red almost the snow cover?

3. Last night the new core (a) crushed dry. Today core in shade crush-packs except upper foot that crushes. Why the greater moistness or ability to pack today?

This is the missing link in the transition.

4. Fuchsine placed on shaded frozen snow in the angle of the Headquarters at 1 pm. is still green at 3:15 pm. Tho the snow or ice crystals leave points of water on the palm of the hand laid on it. Warmth of hand?

But the depression in which the dye was laid has now been found almost dry (points of moisture are extremely small like fine points). When dye was placed on the moister shaded surface adjacent it began the slowly to change to red at one of the two spots. The the other spot remains green despite tiny flecks of moisture on the hand.

On the other hand, a small deposit of fuchsine in the sun at the edge of the shade is now red and spreading readily.

→ Evidently insolation is very potent

Notes "Sunday Mar. 26..." to folder

probably there longer amounts of melt water to act on the dye.

→ The minimum moisture may fail to turn the dye red but the dye when red may persist except when total (dry, brittle) freezing occurs. Then the dye becomes purple but changes with melting back to red again.

Later: In late afternoon when the sun shone more directly into the angle of the house, all of the areas of dye were bright red, including two areas still in partial shadow.

Battery of Triple Register

Next to basement for inspection. Four of eight battery cells had perforations indicating that their capacity was waning.

The set of plates still had the pasteboard spacing between

the leaves. Should not this have reduced the potentiality of the cell?

Cailland and Gendel suggest that the wires, whose insulation is worn, may suffer from tiny shorts during rain and frost with consequent heavier drain on the cells and accelerated exhaustion of the metals. At best the battery has run down in six months tho it is recommended for one and a half years.

Gendel urges that a storage battery with trickle charger be installed after the present replacements are made. These are now the standard equipment recommended for triple registers by the Weather Bureau when electric connections can be made.

→ The supply of replacements is complete together with nuts and washers. To be repaid N.S.P. Co. at Nordeen for a loan last summer

Calorimetry

Gerdel much prefers weighing to using a graduated cylinder in snow-quality determinations but likewise prefers the gram scale to the ind-scale as being three times more sensitive.

He is interested primarily in determining the average snow thermal-quality for an entire snow field and so accepts the average density as determined by snow surveying. I am interested also in studying the snow quality of various types of snow - temperature, density, grain size, cohesion - in the snow field and can determine the density of each sample by weight in the calorimeter scales.

The scales may be too crude, however, to effect my purpose.

Gerdel is finding that vacuum jars do lose heat rather quickly

especially when gathering fauna specimens, totally two feet, into a jar. He prefers water as hot as possible to melt as large a specimen as possible to create the maximum temperature fall to eliminate the instrumental factor.

Thus far even with the top snow above the ice pan he has found only 10 percent of water or as much as could be held by the coarse crystals on the surface.

The lure of finding interesting enough to keep one eager and young.

Wednesday, March 29

Pasture

Min. for night

H-H 28°F (current 39°F)

Min. (current) 39.3°F

Melting

Rain snow on trail just moist.

Dyes

/ band 1c Red in sum.
/d. Green in shade.

2a Red in sun.
2b. Red and green in sun and shade
2c Green in shade, red in sun at base of stick.
2d. Green in shade.

Kerr Test Cores

(a) 61.5 in.
Bottom 6 in. crush. pores.
Remainder crushed except for small remnant that can still be crushed by further effort.

(b) 60.5 in. Core very friable.

Crust

6 in. deep. Dye remains green except stratum 1/16 in. at offset. 12 in. down.

Dyes on Surface

In shade, still green.
In sun, dye red first at bottom of weathered surface in sheltered pockets where the sun was effective. Dye still green on the tips of the crystals where the wind is chill against the snow and accelerates radiation.

Old Dye

Red (slight at bottom) shows rounded strata but not refrozen. affected by adjoining holes?
But dye everywhere red.

Dye to bottom. Red everywhere.

61 in Dye to 15 in from bottom first boring. So no effect from holes.

Temp. Meas. by Gerdel

32°F at bottom. Elsewhere below 32°F

Temp. by thermo No. 1 (sealed) at 60in 32.2°F but next to ground and slow in reading it.

→ But second reading was also 32.2°F.

Near dyes all brilliant in core.

2b. Traces of dye at bottom (60in) Increasingly brighter upwards. Brilliant at top.
Low 6in. crush-faces.
Next 18in almost recrete crushing.
Remainder cracks.

2c. 61in. Dye 10 in. from bottom Possibly further but sampler ran partially into another hole.

2c Repeat. 60.5in dye at bottom or at least to bottom film.
Bottom 28in crush-faces.

Top 16 in. also crush-pacers.
Remainder crushers.

First diving
Dyes 15 in. above bottom
Trace faint but positive.
Top 18 in. crush pacers.
Remainder crushers.
Dyes at top brilliant.

Sampling (diving) easy except
for 3 or 4 thin strata that required
hand pressure.

Today probably heavier melting.
But melting seem in these old
days.

Nieve Penitente

Penitente show the result of
ablation and itself accelerates
melting. A vicious circle.
But there is also a counterbalance
shaded slopes, like hill trail
- level travel.

Temp.

at 36^{in} (No. 1 therm.) 32.0°F

The cotton waste freezes in the hole and only comes out by tearing. Solve this.

Later: Found that a cloth looped in a stout cord could readily be pulled loose and up, even when thrust far down the hole to the thermom. itself.

Photos

(a) Erosion channels on Beacon Hill.
(b) Insolation protection.
(c) 2 views of fence posts in pasture.
(d) Fallen ice arch at door (afternoon).

Stevens W

Line still straight.

Vicious Circle

Says Gerdel, there is even more melting surface than on smooth snow.

Tuchaine

Get an abundance of red dye especially for slopes.

Another Phone Call

Van Evens brings call, "from Winifred regarding dinner — and call back". Mrs Joshua Miller came to see me with her son at the Hospital. Beery is going too.

Ramoff

Same water on ground at depot.

To Reno Wednesday afternoon for dinner with Nesta from Air Force.

Returned to Soda Springs Friday morning. On Thursday noon Bunty came for a farewell call. Would like to get into more research. Is next in civil service and is in radar with the Army.

Friday, March 31

Resetting H-T's

Pasture

11:40 am.

Psychrometer in shade

Wet 36.2°F

Dry 44.0°

Max. 52.6°F Reset 48.0°

Min. 6.0° " 47.2°

Hatch

12:05 pm.

Wet 39.0°F

Dry 48.0°

Current temp. 48.4°F

Dye

11:30. Pasture

No. 1 Plantak dye. Red immediately.

No. 2 " " " "

Melting 3/8 in. Today.

+ Smooth Snow

Why is the surface of the snow now smooth in. why has the sieve pentente evened off?

"yesterday much like today" - Gendel.
Only the more gradual cusps remain.

Statistical Analysis

The snow surveys of 35 meas. by J.A.C. and R.W.G. show a variant of 1.1 % and by Blair Eddy 1.8%.
"Negligible" - R.W.G. Grateful, for he was suspicious.

Temp. in Snow by R.W.G.

Temps in snow by Gendel show diurnal variation. Temp. in middle of snow was below 32°F but today is uniformly 32°F.
Probably 32°F at top and bottom.
"Melt water traversed snow thro frozen" - Gendel.

→ So there was a change in the crystal film from frozen to moist at 32°F. Can this be detected?

Quiz suggests series of thermometric points in a snow pit that can show melting and freezing.

Fri - Mch 31
Stevens S.
Still leaves -
* In Shelter. Preliminary to 6 pm
Min 53° 52
H-T 53° 52°
T^a 53° 53° +
T^b 54°F 52°

Snow in shade
still wet.

---

at same temp. of 32°F.
32.2°F at bottom and top reveals possibilities.

Crows Nest - Stevens Q

Climbers evidently ride the rim of the crowsnest. Why not use braces [sketch] 33 in. long.

Crust and Temps

5:30 pm.
Crust in shade 3/8 in. deep.
Still soft in shade at 4:30 pm
Temp. in shelter 53°F.

A larger series of thermometers will now be put to use, particularly the small thermograph called "junior" which will be placed head high above the snow on the stairs.

* 6 pm.	Current min.	53°F
	H-T	53°F
On stairs -	Therm (Jr)	49°
On snow	Therm.	47°
6:50 pm	Teletherm.	62.1° (In sun?)

By field glass seems to be a touch of [illegible] on [illegible]

7:20 pm.

	Teletherm.	50.7°F
	Current min.	43.2°
	H-T	44.5°
On Firn	Thermog. (flt)	37.0°
On snow	Thermog. (2 in. up)	34.5°
	Exposed therm	31.0°
	Sealed (in snow)	30.5°
	1 in. down	32.0°

7:30 pm
Crust 1 3/4 in. thick.

Runoff

6 pm.
Water in gravel at Depot.

Melting

No. 1 @ 50 in. core. Dye within 12 in. of bottom. Core wet and crush-packs. Min. last night 20°F a pair ice strata

No. 2 @ 57 in. Hole 1½ in due to insolation from red dye.
Dye possibly to bottom, at least

to 21 in. from bottom. Crust - coarse, only moderately moist. Hat in least wet.

No. 2 (second drive)

Dye 21 in. from bottom. Plains. Coarser crystals full red. Water → streaks uniformly colored.

→ Study crystal character and dye intensity. Take photos in color.

Crust

→ 6:45 pm. Crust in sun 3/8 in. thick. Sun is on the hills.

Sun Penetration

Twig now 3½ in. deep in snow. Snow is melting down to it. ("melting out").

New Test Cores

(1) 60 in. Core passes. Moist. Tiny ice-stratum.

(2) 58.5 in.

Dye turns red promptly along entire core.

→ On snow crust both Tyk and deeper

crystals turn red. Air calm; snow very low but snow moist.

7 pm. Planted
No. 1 & and No. 2 &
1 & turns red slowly (in shade).
2 & turns red quickly (in planting row).

Crust
Crust now 1/2 in. (snow has just gone)
Crystals where loosely.

Temps.
7 pm. M-T 48°F
Current min. 45.5°
Anemom. 664 mi.
Snow Stake 55 in. (48 in. in hole)

Seats of Snow
Seats of snow on the dam now badly weathered.

Jan Moons
On March 28, a crescent moon above three full moons, in the top of Arthur Guillard's sentinel tree.

Wind movement Mar 14.
Channels Mar 14.

Return from Reno Mar. 17
8:30 a.m.

Truckee precip.
0.41 in

Erosion line over
summit Lincoln-Beacon

Period of east wind?

Water Plants

From Notebook 12, Mar. 17, 1944 "Leases"

Mar. 58°F 22°F	10 -	0.02	- Snow Survey
50 31	12 -	0.45	
33 14	13 -	0.34	
		Total 0.81	
	16 -	{ Wind 15 mi. hr	
		" 17 " "	
	17 -	" 8 " "	
		" 9½ " "	
	18	" 7 " "	
		" 8 " "	

Snow Survey 23 in.

Mar. 10	86.5	30.4
Mar 18	74.6	29.8

Truckee

12	.22
13	.40
14	T

Mar 11. 0 yr
12 - 5 Ski suits
13 - Storm

Notebook 12, Mar. 18, 1944

FEDERAL AND STATE COOPERATIVE SNOW SURVEYS

State: California
Drainage Basin: South Yuba
Snow Course: No. 1 Soda Springs
Party: J. E. Church
Date: Saturday March 18, 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	59.5	58.5 -2.0	82.5	103.4	20.9		
	1a	57.5	57		104	21.5		
	2	78.5	68.5	82.5	109.8	27.3		
	3	77	75.5	82.5	113.2	30.7		
	4	74.5 -.5	70.5 -.5	82.5	114.2	31.7	½ in wet soil watersoaked Bottom of snow 1 in	
	5	70	67	82.5	110.8	28.3	Coarse crystals	
	6	72.5 -.5	70.8 -.5	83	113	30	½ in moist earth ¼ in compact moist ice crystals	

(73 written above Water Content / Density heading)

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

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

No. 1 of 3 sheets. Comp. by J.E.C. Checked by ....

FEDERAL AND STATE COOPERATIVE SNOW SURVEYS

State: California
Drainage Basin: South Yuba
Snow Course: No. 1 Soda Springs
Party: J. E. Church
Date: Saturday March 18, 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
	7	72 -.3	68.6 -.3	82.5	111.3	30.8		Dry ice crystals
	8	73 -.5	73 -.5	82.5	111.6	29.1		
	9	78.5	78.5	82.5	112.8	30.3		
73	10	76.5	74.3 -1.8	82.5	112.8	30.3		
	10a		-.5		113			Redrove for core
	11	70.5	68.9	82.5	111.1	28.6		
	12	75	73.2	82.5	112.2	29.7		Moist ice crystals Green grass root

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FEDERAL AND STATE COOPERATIVE SNOW SURVEYS

State: California
Drainage Basin: South Yuba
Snow Course: No. 1 Soda Springs
Party: J. E. Church
Date: Saturday March 18, 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
1-10		728.7				290		
Av.		73				29.0	39.7	
2-4 and 6-12		746				298.5		
Av.		74.6				29.8	39.9	

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Notebook 12, Mar. 25, 1944

FEDERAL AND STATE

COOPERATIVE SNOW SURVEYS

State California

Drainage Basin South Yuba

Snow Course Soda Springs No. 1

Party J. E. Church

Date March 25, 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	53.5	49.2	82	104	22		Coarse wet crystals
	2	69	65	82.5	111	28.5		
	3	65	61	"	109	26.5		Same wet
	4	66 -1.0	59 -1.0	"	110	27.5		Dripping [illegible]
	5	61.5	56.5	"	108.5	26		Saturated
	6	64.0 -0.3	62.0 -0.3	82	110.0	28		Wet soil
	7	64.0 -0.3	59.0 -0.3	82.5	107.5	25*		Dry coarse grains
* close [illegible] other holes								

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FEDERAL AND STATE

COOPERATIVE SNOW SURVEYS

State California

Drainage Basin South Yuba

Snow Course Soda Springs No. 1

Party J. E. Church

Date March 25, 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
	8	63.5	60.5		109	26.5		
5:30 pm Crust 1/16 in. Core froze to cutter								
	9	70.5	66.7 +1.5	82	110	28		Dry
Incipient crust and spray [illegible] down in sampling. Hence shorter cores slightly.								
	10	63.5 -0.5	61.0 -0.5	82.5	109	26.5		Dry
	11	63.8 -0.3	60.8 -0.5	"	110	27.5		Wet soil [illegible]

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FEDERAL AND STATE

COOPERATIVE SNOW SURVEYS

State California

Drainage Basin South Yuba

Snow Course Soda Springs No. 1

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Date March 25, 1944

*Description or Number of Course	†Sample Number	Depth of Snow Inches	Length of Core Inches	Weight of Empty Tube	Weight of tube and Core	Water Content Inches	Density Per Cent	Remarks
	12	66.5	62.8 -0.3	82.5	108.5	26		Dry
DONT WADE. [illegible] tracks will help pit and melt snow at points of measurement. Use web snowshoes - even on lighter crusts.								
				average				
1-10		63.8				26.4	41.4	

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From Notebook 12, Mar. 25, 1944

FEDERAL AND STATE

COOPERATIVE SNOW SURVEYS

State ....

Drainage Basin ....

Snow Course ....

Party ....

Date — Dyes —

*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
North								
	Depth 65 in Dye 26 in							
	26 in. crushes porous							
	Remainder crushes dry to bottom							
South meas.								
		Dpth 63 in Dye 17.5 in						
		Upper 2/3 crushes porous						
		Lower 1/3 crushes moist						
		last 4 in crushes porous						
	But snow course at first							
wet, Quick change?								63
								18

45

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Sunday March 26 —
(Min. temp. H-T. 8.5°F)

8 am
Teleth. 19.6°F
H-T 14.0
(Min 8.5°)

On Snow
Thermog. (in sun) 15.0°
(Min 4.0°)
Sealed 7.5°

5 pm
Teleth. 44.8°F
H-T 40.0°
Thermog. (in shelter) 40.0°

From Notebook 12, Mar. 28, 1944

Open

Teletherm 43.4°F

H-T 37.0°

On Snow

Therm.

(in slanting arm) 34.0°

Open therm.

(in arm) 32.0°; arm 30.3°

Sealed in open

channel on snow 28.2°

In Snow

1 in. deep 31.8°

3 1/2 in. " 32.1°+

Monday, March 29

7 a.m. [Min. A-T 2-4 a.m. 12.0°F]

Telethermo. 22.0°F

A-T 20.0°F

[Min. 2-4 a.m. 12°F]

Air cement

Thermog. 13.5°

[Min. 6.5°]

Open therm. 16.2°

Sealed in open channel 12.5°

Below cement

1 in. below 15.8°

3½ in. " 19.0°

9:45 pm Fresh east wind
?

Telethermo. 29.3°F

H-T 28.0°

On dress

Thermog. 24.0°

Exposed 23.0°

Sealed (in groove) 20.0°

Tues. March 28 — 5 — fresh wind

(Min. H.T. 25.0°)

7:30 am

Telethermom.	25.3°F
H-T	26.0°

Above snow

Thermog.	22.0°
Exposed therm.	22.0°
Sealed in chamb.	22.0°

In snow

2 in. deep	22.0°
7 in. "	27.8°
8 in. " " [4-8 in] . . .	29.5
41 in. " . . .	31.8°