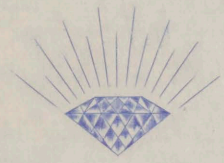
FIRST CLASS REPAIRING, ENGRAVING & DIAMOND SETTING



R. HERZ & BRO. INC.
JEWELERS
FINE DIAMONDS AND WATCHES
ESTABLISHED 1885

RENO, NEVADA

October 18, 1935

Wants 5 copies -
1 to Mr T
1 to Mam

Dr. J. E. Church
University of Nevada
Reno, Nevada

Dear Dr. Church:

Regarding our conversation on the length of snow samplers, you informed me that the recommendation was for 2½ foot sections instead of the longer sections that we have been using. As you know, we have been using sections as long as 9 and 10 feet, but this last year we experimented with 4 foot sections and found them very practical and short enough for convenient transportation, both in automobiles and on knapsacks.

Where only minimum depths of snow are encountered the 2½ foot sections may do, but from my experiences I feel that a longer section such as 4 feet would be more practical for general use particularly in the Sierras. Last winter our snow depths ran from 25" and 30" up to 160". Where greater depths are encountered I feel it would take too many sections for real practical use if the real short sections were adopted, where 4 foot sections would not mean near as many connections.

The longer sections, say 4 feet, would of course, have a lower manufacturing cost as there would not be as many joints necessary. The 4 foot sections we tried out this year, we handled very nicely on our knapsacks and they did not interfere with our

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traveling on skiis at any time regardless of the speed we ran.

I am enclosing a rough illustration as to how we handled the 4 foot sections this year and how we handled the longer sections in other years, which were not as convenient as the 4 foot ones.

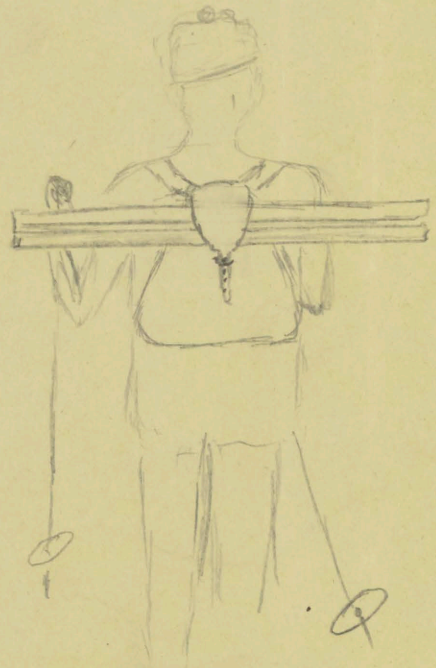
In the case of 2½ foot sections I feel that there would be too many joints necessary to make a 20 or 25 foot sampler which we often have occassion to use and I am sure you will agree with me that a slightly longer section than 2½ feet would be more practical and economical.

Assuring you of my willingness to cooperate in every way, I am with kindest regards,

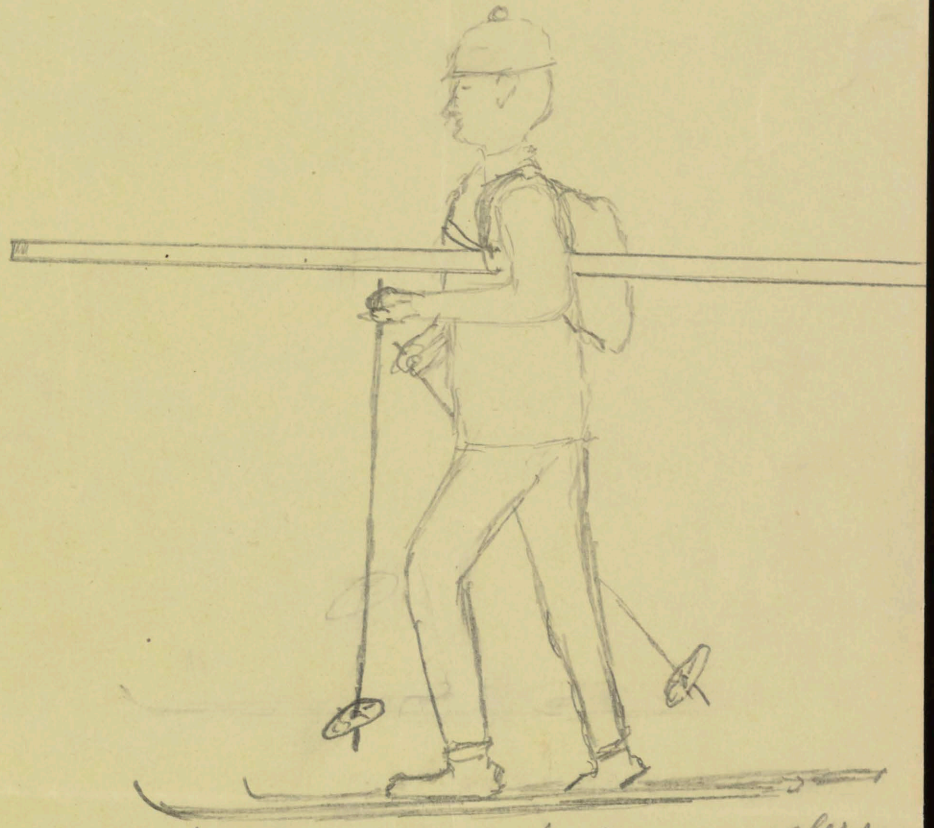
Yours very truly,

Fred Herz.

FH:IM
Enc.

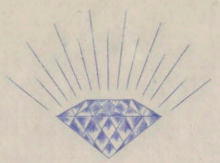


The 4 foot sections are strapped on top of our Knapsacks. They did not interfere with skiing either up or down hill.



This is the way we carried the long samplers strapped close under arm pit over shoulder and one strap across chest and under other arm to hold close to body.

FIRST CLASS REPAIRING, ENGRAVING & DIAMOND SETTING



R. HERZ & BRO. INC.
JEWELERS
FINE DIAMONDS AND WATCHES
ESTABLISHED 1885
RENO, NEVADA

March 6, 1936

Dr. J. E. Church
Agricultural Experiment Station
University of Nevada
Reno, Nevada

Dear Doctor Church:

Enclosed is a record of the Leupold Volpel scales as well as the Ferguson scales which we tested to their limit, using a 98" sampler as a base and setting the instruments at zero. This shows that the scales are practically unlimited as far as snow conditions are concerned here.

A sampling tube 250" long and set to zero would still leave a measuring capacity on the scale of 260" of water. This shows that even a longer sampler than 250" could be used on this scales without reaching the limit of the scales.

Yours very truly,

R. Herz & Bro. Inc.

By Fred Herz

FH:IM

L. V. #5 Leyfold & Volpel Balance.

With Two Sections 98" weighing 3.1 lbs.

Weight in Lbs	Scale Reading actual weight.	Theoretical weight	Difference.
1	15.5	15.67	+0.17
2	31.8	31.34	−0.46
3	47.	47.01	+0.01
4	62.8	62.68	−0.12
5	78.4	78.35	−0.05
6	94.	94.02	+0.02
7	109.7	109.69	−0.01
8	125.5	125.36	−0.14
9	141.5	141.03	−0.47
10	157.3	156.70	−0.60
11	173.	172.37	−0.63
12	189.2	188.04	−1.16
13	204.5	203.71	−0.79
14	220.	219.38	−0.62
15	236.5	235.05	−1.45
16	252.	250.72	−1.28
17	268.	266.39	−1.61
18	284.3	282.06	−2.24
19	300.	297.73	−2.27
20	316.	313.40	−2.60
21	331.5	329.07	−2.43
22	347.	344.74	−2.26
23	363.	360.41	−2.59
24	378.2	376.08	−2.12
25	394.	391.75	−2.25

Mean error −2.10

Mean error

FERGUSON Balance

With two sections 98" weighing 3.1 lbs.

	Actual weight	Theoretical weight	Difference
1 lb.	16.5	15.67	−0.83
2 "	31.5	31.34	−0.16
3 "	47.	47.01	+0.01
4 "	63.	62.68	−0.32
5 "	78.5	78.35	−0.15
6 "	94.5	94.02	−0.48
7 "	110.5	109.69	−0.81
8 "	126.5	125.36	−1.14
9 "	142.5	141.03	−1.47
10 "	158.3	156.70	−1.60
11 "	174.	172.37	−1.63
12 "	190.	188.04	−1.96
13 "	205.5	203.71	−1.79
14 "	221.	219.38	−1.62
15 "	235.3	235.05	+0.25
16 "	252.3	250.72	−1.58
17 "	268.3	266.39	−1.91
18 "	284.	282.06	−1.94
19 "	300.	297.73	−2.27
20 "	316.5	313.40	−3.10
21 "	331.5	329.07	−2.43
22 "	347.3	344.74	−2.56
23 "	362.5	360.41	−2.09
24 "	378.	376.08	−1.92
25 "	394.5	391.75	−2.75
26 "	410.5	407.42	−3.08
27 "	426.5	423.09	−3.41

Quit

Mean error

TEST OF SNOW SAMPLER SCALES AS NUMBERED 1 to 6 AND FERGUSON SCALES.

Initial Weight Used To Bring Scales To Zero.

Utah Scales #1

lbs.	W.C.	Theoretical Weight
1	16.3	15.67
2	32.5	
3	48.5	
4	64.5	

Limit 66

Utah Scales #2

lbs.	W.C.	Theoretical Weight
1	15.5	15.67
2	32.	

Limit 35

Friez Scales #3

lbs.	W.C.	Theoretical Weight
1	16	15.67
2	32	
3	48	
4	64	
5	80	
6	96	
7	112.5	

Limit 125

Friez Scales #4

lbs.	W.C.	Theoretical Weight
1	16	15.67
2	32	
3	48	
4	64.5	
5	80.5	
6	97.5	

Limit 105

L.V. #5

lbs.	From 0 without Initial Wgt.	From 0 with 10½ lbs. Initial Wgt.
1	11.3	15.8
2	22.6	31.5
3	43.9	47.5
4	59.8	64.
5	75.5	79.5
6	90.5	95.
7	106.5	111.
8	127.8	127.4

Friez #6

lbs.	From 0 without Initial Wgt.	From 0 with 10½ lbs. Initial Wgt.
1	15.5	16.
2	31.5	32.
3	47.	48.
4	62.2	63.5
5	78.5	79.
6	94.	95.
7	108.	111.
8	126.	126.

Ferguson Scales

lbs.	From 0 without Initial Wgt.	From 0 with 10½ lbs Initial Weight
1	16.	16.
2	32.	32.
3	48.	48.
4	64.	64.
5	79.5	80.
6	95.5	95.5
7	111.5	111.5
8	127.	127.5

@ 1.5" Core 1 lb.= 15.67" W.C.

On Scales 1, 2, 3, and 4 there is occassionally ½" variation when the same weight is weighed several times, but this is no doubt caused by the friction arising. The most sensitive scale which repeats exact weights is the LV 5. However, in this scale there is some variation where no initial weight is used for the first three or four pounds where no doubt the calibration is somewhat off. The old original Ferguson scale is also very accurate on repeated weights. Regarding the balance weight, though very accurate, may be a bit sensitive for field use particularly in stormy weather. It would, no doubt, be very efficient for use with evaporation pans in which case the sliding weight would have to be increased or the rod lengthened to accommodate the heavier measurements required.

Regarding the Snow Sampler Scales, there is no doubt that model used by the Nevada Co-Operative Surveys is the practical one for all snow depths as it has a range that will take care of every course in the Sierra Nevadas in maximum years.

~ Weakness ~

Snow if shallow in drip pan may become heavy with capillary melt-water and freeze in it - and if water in pipe runs down into tank.

So should use lids until snow becomes deeper and too thick for usual capillary accumulation.

How about Chinooks?

Get photostats of these and photo of cutter.

Runoff and Percolation
from Storm of Feb 11-13, 1947

Feb. 13, 1947.

Precip. at ~~Pero~~ ~~approx~~. .05 in.

On sagebrush slope north of Campus soil was moist 11 in. deep & hardpan.

In iris bed southeast of Hatch Station Building soil was moist 18 in. Both sites were clay.

Does the depth represent the winter accumulation of moisture?

Rivers runoff at Jarad, rose from 400 to 1500 CFS for 2 days then fell at rate of 400 CFS per 8 hrs to 400 again! That is, the rise of the river was a flash. [Over]

Get exact data.

Is not such flash the difference between rain and snow cover?
What is total gain from rain?

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

P. O. BOX 94[illegible]
ALBANY 1, N. Y.

OFFICIAL BUSINESS

Trouble; temp just an melting point. Cold other side 13 in in 15 min. Depressed yesterday.

Try skewer at 2 in at time

Auger
4 in in 4 min
Core blocks in throat.

Wolfstead Starts to load
$2\frac{1}{2}$ in in grooves at $2\frac{1}{2}$ in - 3 in

NB - Straight grooves good only after [illegible]

Emerson Wilson
Dr Steinmiller
Ernie Mack (Camera)
Lasher

Fox shrand 01T-8146

Cuts [illegible] inside
Close - Closer
inside of motor

So same [illegible] to closing
core freezing
but not [illegible] completed

Two [illegible] feed back into bottom of tube
Closer

CAPACITY OF MOUNT ROSE DIAL BALANCE

Approximately 28 Ft. of Snow

1. Weight of Sampler

30 Ft.	tubing	206 in. water
1	driving wrench	23 in.
	Total	229 in.

2. Estimated total capacity of balance

3 turns round dial of	150 in.		450 in.
To overcome tension	36 in. (?)		
Gross capacity			414 in.
Net capacity	414 in - 229 in.	=	185 in. (water)

3. Depth of snow

At 55% max. density 185 in. water = 336 in. or 28 Ft. packed snow.

NB: Max. net capacity with adjustment to 0 in. and omission of tension is 215 in. water.
Snow at 55% density is accordingly 400 in. = 33 Ft.
At lighter densities the depth is correspondingly greater.

GENERAL MACHINE AND REPAIR WORK
CUT GEARS - SPOCKETS

MILLING - GRINDING
PISTONS - RINGS - PINS

HANSEN MACHINE WORKS

R. S. THOMSON, Prop.

MACHINISTS and ENGINEERS

728 TWELFTH STREET

Phone 3-7755

SACRAMENTO 14, CALIFORNIA

February 10, 1947

Dr. J. E. Church
University of Nevada
Agricultural Experiment Station
Reno, Nevada

Dear Dr. Church:

We are shipping you to-day via Railway Express the last of the India Supply Mission's equipment as following:

1 - Complete sampler tube
1 - Cutter Attached (the extra cutters were shipped with the 1st shipment via the boat)
1 - Wrench
1 - Staff & snap
1 - Core hook
1 - file & handle
2 - Spanner wrenches
2 - Jars of grease for dural tube coupling thread.

Your time to leave for India is getting short but on the other hand I would think you are anxious to get started. I hope the work we have done for you is satisfactory and a help to you. I wish you the best of luck and a safe trip to India, and should you find time to write I would be pleased to hear from you as to your arrival and also your stay there.

I might add I received a check for the full amount from the India Mission Supply, they were very prompt. Wishing you a very pleasant trip.

Best Regards

HANSEN MACHINE WORKS

By _____
R. S. Thomson

RST/iw

ISM-816

INDIA SUPPLY MISSION

February 11th, 1947

3637

Mr. A. N. Khosla, Chairman,
Government of India,
Central Waterways Irrigation &
Navigation Commission,
NEW DELHI, India.

Indent No. 1/Cash/WI-106(9) DGI & S - AP 41(3)
dated 20th November, 1946. Snow Survey Equipment

Dear Sir:

This is to confirm the receipt of your letter No. WI-114(3), dated January 8th, requesting that transportation of some of the equipment by air be arranged in consultation with Dr. Church.

Having consulted him, it was decided that shipment of our Contracts DC-2863 through DC-2866 and DC-2828 be made by ship. The material which comprises Canvas carrying cases (D.C. 2863), 6 Snow Sampler Packframes (D.C. 2864), 6 Snow Samplers with accessories (D.C. 2865), Snow Shoes, Sleeping Bags, Boots, Clothing etc. (D.C. 2866) and Sno-Cat (D.C. 2828), has cleared from San Francisco on January 30th per S.S. Mapia, B/L # SF 14, dated January 21, 1947, and is expected to arrive in Bombay on March 7th, which meets with Dr. Church's plans. We take it that you will make necessary arrangements at your end for transportation of this equipment.

We are also in receipt of the copy of letter No. WI-106(9), dated 8th January, 1946, addressed to the Deputy Director, Imports and Shipping, Industries and Supplies Department, American Purchase Section, South Block, Imperial Sectt., New Delhi, and note that the above indent be regarded as cancelled.

We are not quite clear if this means that Item 2, 6-foot triangular Towers and Alter Shields and Item 4, 2-Wenner Three Component Accelerograph are to be regarded now as cancelled. Please note that an order for Alter Shields in accordance with your previous instructions has already been placed, our Contract D.C. 2822 refers.

Also after consulting Dr. Church we placed an order with Leupold and Stevens for 6 Mount Rose, Dial Type balances, our Amendment # 1 to D.C. 2822, dated January 24th refers.

Regarding Triangular Towers, Dr. Church is of the opinion that money could be saved if these are constructed in India from Leupold and Stevens' blueprints. We will advise you of this final decision.

In the meanwhile we shall be glad to know at an early date your views with

ISM-816

INDIA SUPPLY MISSION

respect to Triangular Towers and Wenner Occelerographs.

Regarding Items 1 and 3, orders have already been placed after consultation with Dr. Church.

TUCKER SNO-CAT CO. We are in receipt of a letter dated January 22nd from Mr. J. Tucker of this Company giving some operating advice. For your information a copy of this letter is attached.

Yours very truly,

D. N. Kowshik
Deputy Director

ASW
Enclosure (1)

cc: Dr. J. E. Church

c
o
p
y

TUCKER SNO-CAT CO.

Rt. # 4, BOX 385-A
MEDFORD, Oregon
January 22, 1947

India Supply Mission
635 F Street, N. W.
Washington, D. C.

Gentlemen:

We wish to advise you to instruct all operators of the Sno-Cat as to the potential danger of the pontoon and track. Although there have been no serious accidents, it has come to our attention that due to the steep inclines which the Sno-Cat will ascend and descend, the danger chiefly lies in the descending of steep grades. It is extremely advisable to keep all extremities of the body within the limits of the cab should an operator set his emergency brake. During a descent it has been known for the pontoon to completely turn over and thereby pass close to doors and windows. The versatility of the Sno-Cat on rough terrain requires these pontoons to be free floating.

It is good practice to keep within the cab at all times as a means of forming good driving habits.

Very truly yours,

TUCKER SNO-CAT CO.

By: "J. M. Tucker"

Bernard Report

Mainly equipment

1. Tight alter-windshields.
   (a) In Pass.
   (b) Engs. + Stevens W
   But at different elevations.
   Have now raised Engs. to level of W.

2. Further improvement in Sacto Seasonal Gage.
   ~~(a)~~ No air space in orifice.
   No vertical wall.
   Use of paraffin or ski-wax surface.
   Black to accelerate melting.
   Tight shield.
   Placed near Engs + W.

3. Sun-~~Heater~~ for batteries.
   ~~Electric~~.
   New black box with triple window and heavier glass-fiber

insulation for other 5 walls of box. Fiber-Glass Co speeded up delivery to obtain some advantage of the midwinter cold.

~~Max. min. thers~~

Because of staining of thermog exposed directly to sun's rays in first test box, a max.-min. set of thers for daily extremes will now be used temporarily behind an impervious thermocouple screen - a ~~multiple bridge recorder of broad range~~ recorder would provide continuous records whatever the probable range of temperature within or without the box.

4. Drip-pan Apparatus for measuring snow-melt.

Consists of conical drip-pan connected with an underground tank in the area ratio of 10 to 1,

the diameters of the two being 24 in. to 8 in.

The measurement is made by a metal staff graduated to tenths of an inch that is lowered down a tube into the tank. The height or length of the tube depends upon the depth of the snow cover and at Donner Pass is approximately 20 ft. A trestle with ladder in most cases is essential.

~~a suction pump will o~~

Since the ~~tank~~ level of catch in the tank rises 10 times higher than the snow melt and the depth of the tank can not feasibly exceed 48 in., frequent pumping is necessary.

This may be done by a suction pump if the snow cover does not exceed 4 ft in depth.

But a force pump is necessary for the greater lifts.

The general plan of the apparatus is shown in the accompanying plans.

The contents can be assured against freezing by the use of Calcium Chloride. The drip pan is painted black to assist melting in the intervals period of occasional thaw and freeze, but the thaw water becomes permanently frozen and persists in the pan and pipe.

If the snow falls heavily on the pan, the thaw is avoided, and the necessity of pumping out the can is avoided as is the labor of clearing pan and intake from accumulated ice.

This weakness has now been corrected by placing a lid over the drip pan during summer and autumn ~~during summer to~~ until snow has fallen to a safe depth, when the cover can readily be drawn out without disturbing the overlying snow.

In the study of melt from where the snow is shallow and chappable chinooks, the same method can be employed, the cover being retained until the chinook under study has started. This is specially necessary where temperature changes are extreme.

Even without covers,

Complete records of snow-melt were obtained at two ~~of~~ the four snow-melt stations. Since only "stick" measurements were possible, the details of rate of melting depended on the ~~frequency of~~ time interval between the measurements. Where necessary, these were prolonged into the night.

~~It was not~~ Complete under clear sky, the phases of The snow-melt at the surface was found to have a similar but deferred phase of percolation at the bottom of the snow. Both ceased for 12 to 16 hours in the total 24-hour day; the snow-melt ceasing before sunset and the percolation at broadly 10 pm. The snow drains out to the extent of gravity flow

impeded by capillarity.
altho the snow cover may
freeze at the surface, the
snow beneath the crust remains moist ~~below~~
~~and with capillary moisture~~
and loses it deep penetration of cold
by capillarity and is
ready to transmit new melt
water ~~when the increment~~
~~gives~~ under the overnight
of gravity. The crust is
easily penetrable to melt-water
on its surface and seems
~~not~~ to cause little obstruction or delay to
~~delay~~ the
descent of the new melt.
Details are being reserved
for the next report in June.

$5. Snow-sampler Cutters.

Paul Sirkegian — New year 1947

Mashinology, Moscow.

Report on Soda Sfgs.

Equipment

1. Tight wind shields
Table

2. Avoiding capping.
Eliminate dead air space
Black. Paraffin

3. Tight vs open shields
under varying velocity
of wind.

4. Sham cutter
(a) wolf teeth (b) auger

5 – Drip pan and tank (a) Shallow and. Suction pumps (b) Deep and. Force pumps.
Lids. Paraffin on black.
(c) Chimneys.

TEST OF SNOW SAMPLER CUTTERS IN BLOCK OF ICE

-0-

At Union Ice Company, February 1, 1947.
Temp. 26° F.
Same pressure (hands only on wrench) on all.

1. Standard cutter unimproved (Friez).
   Penetrated 1/2 in. Only a reamer in effect.
   Price $9.50 (L-S Co.)

2. Original cutter (Nevada) with plain facets.
   No test.

3. Auger cutter is penetrating 15 in.
   Max. depth 16-1/2 in. but can be driven farther. Progress 1 in. per minute.
   No melting tho there is finally a tendency of sampler to adhere to ice. Cuts entirely at broad edge of auger and uses grooves only to raise the ice shavings.
   But the care has risen to 30 in. in tube .
   Ice shavings apparently feed into the slots and rise in tube. Or the ice care is comminuted and expands. Only thin buttons of ice found when core is emptied out.
   Try the tube without slots but extend the spiral grooves up the coupling.
   Here is an ice or glacier cutter. Little further improvement required.
   Price 1/2 coupling $4.90, Cutter $20.30 = $25.20

4. Auger Cutter Streamlined (latest)
   Drove 1-3/4 in. Easier and faster than auger cutter but limited in penetration of ice. Cuts only thinly at points and depends much on edge of helical grooves. Cost practically the same as auger cutter but not worth the cost. The helical curves are always expensive.

5. Wolf-tooth Cutter
   Wolftooth cutter is easier than No. 4 but same as auger. Lines diagonal but straight. Can be driven with little or no revolving.
   Penetrated 2-1/2 in., then started to slip.
   But no room for next joint. Will build it longer and broader.
   "Really good tho limited in ice." Costs little more than Standard Cutter.
   Price $7.50.

Conclusion:
   Develop Auger Cutter for ice or firm (old snow), and the Wolf-tooth for seasonal snow.

Illustration:
   Cake of ice showing depth of penetration of each.

Test of Snow Sampler Cutters in Block of Ice

At Union Ice Company February 1, 1947.
Temp. 26° F. (?)
Same pressure (hands only on wrench) on all.

~~(A latest~~

1. Standard cutter unimproved (Frieg).
   Penetrated 1/2 in. Only a reamer in effect.
   Price $9.50 (L-S Co).
2. Original cutter (Nevada) with plain facets.
   No test.
3. Auger cutter is penetrating 15 in. Max. depth 16 1/2 in. but can be driven farther. Progress 1 in. per minute.
   No melting tho there is finally a tendency for sampler to adhere to ice.
   But the core has risen to 30 in. in tube
   ~~Progress 1 in. per minute.~~
   Ice shavings apparently feed into the slots and rise in tube. Or the ice core is comminuted and expands. Only thin buttons of ice found when core is emptied out.
   → Try the tube without slots but extend the spiral grooves up the coupling.
   Here is an ice or glacier cutter. Little further improvement required.
   Price 1/2 coupling $4.90 Cutter $20.30 = $25.20

Cuts entirely at ground edges of auger, and uses grooves only to remove the ice shavings

4. Auger Cutter Streamlined (latest).

Drove 1 3/4 in. Easier and faster than auger cutter but limited in penetration of ice*. Cost practically the same as auger cutter but not worth the cost. The helical curves are always expensive.

Cuts only thinly at points and depends much on edges of helical grooves.

5. Wolf-tooth Cutter.

Wolftooth Cutter is easier than No. 4. but same as auger. Lines diagonal but straight - Can be driven in snow with little or no revolving. Penetrated 1 1/2 in., then started to slip.

→ But no room for next joint. Will build it longer and broader.

"Really good tho limited in ice." Costs little more than Standard Cutter.

Price $7.50

Conclusion.

Develop auger Cutter for ice or firn (old snow) and the Wolf-tooth for seasond snow.

Illustration -

Cake of ice showing depth of penetration of each.

SNOW SAMPLER No. 22

Initial Weight 2 lbs.

Weight applied to Sampler Lbs.	Reading on Sampler
0.2	3.2
0.4	6.0
0.6	9.5
0.8	12.5
1.0	16.0
2.0	32.0
3.0	47.0
5.0	78.0
8.0	127.0

SNOW SAMPLER No. 11

Initial Weight 2 lbs.

Weight applied to sampler Lbs.	Reading on Sampler
0.2	3.0
0.4	6.0
0.6	9.2
0.8	12.0
1.0	15.5
2.0	31.5
3.0	47.0
5.0	78.5
8.0	126.0

SNOW SAMPLER No. (no number)

Initial Weight 2 lbs.

Weight applied to Sampler Lbs.	Reading on Sampler
0.2	3.2
0.4	6.3
0.6	9.8
0.8	13.0
1.0	16.0
2.0	32.0
3.0	48.0
5.0	76.5
8.0	125.0

Jan 1934

Tests of No. 1 Scale, with initial weight corresponding to a 30 inch (3 lb) tube and 5 ft. (5 lb) tube placed in the cradle before the weights were added, and with index adjusted to zero.

Weight added	Computed reading	With 3 lb. initial Wgt.	5 lb. in.Wgt.
1 lb.	15.65	15.65	15.65
2 lb	31.30	32.00	31.80
3 lb.	46.95	47.50	46.95
4 lb.	62.60	63.00	62.65
5 lb.	78.25	78.50	78.20
6 lb.	93.90	94.00	93.75
7 lb.	109.55	109.55	109.00
8 lb.	125.20	125.00	124.50
9 lb.	140.85	140.50	140.00
10 lb.	156.65	156.00	155.50

2.65# initial wt.

0.20	3.0
0.40	6.2
0.60	9.4
0.80	12.8
1.00	16.0
1.20	19.0
1.50	23.8
1.75	27.8
2.00	32.0
2.50	39.8
2.75	43.8
3.00	47.5
3.50	55.4

Jan 1934

Tests of No. 2 Scale, with initial weight corresponding to a 30 inch (3 lb) tube and 5 ft. (5 lb) tube placed in the cradle before the weights were added, and with index adjusted to zero.

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Weight added	Computed reading	3 lb. initial Wgt.	5 lb. in. Wgt.
1 lb.	15.65	15.50	15.65
2 lb.	31.30	30.60	30.80
3 lb.	46.95	46.00	46.10
4 lb.	62.60	61.50	61.50
5 lb.	78.25	77.75	78.00
6 lb.	93.90	93.90	93.90
7 lb.	109.55	109.55	109.90
8 lb.	125.20	125.40	125.50
9 lb.	140.85	140.85	141.00
10 lb.	156.65	156.55	156.55

		2.65 lb. initial wt.
.20		3.00
.40		6.00
.60		9.40
.80		12.50
1.00		15.50
1.20		18.60
1.50		23.3
1.75		27.1
2.00		30.9
2.50		38.8
2.75		42.2
3.00		45.7
3.42	53.5	52.6

August Peterson

Hansen

Jan 1934

Tests of No. 3 Scale, with initial weight corresponding to a 30 inch (3 lb) tube and 5 ft. (5 lb) tube placed in the cradle before the weights were added, and with index adjusted to zero.

Weight added	Computed reading	3 lb. initial Wgt.	5 lb. initial Wgt.
1 lb.	15.65	15.65	15.65
2 lb.	31.30	31.00	31.10
3 lb.	46.95	46.25	46.25
4 lb.	62.60	61.50	61.50
5 lb.	78.25	77.25	77.50
6 lb.	93.90	93.00	93.10
7 lb.	109.55	109.00	109.40
8 lb.	125.20	125.00	125.10
9 lb.	140.85	140.75	140.85
10 lb.	156.65	156.25	156.25

2.65 lb. initial wt.

0.20	3.10
0.40	6.20
0.60	9.80
0.80	12.80
1.00	15.80
1.20	18.80
1.50	23.50
1.75	27.30
2.00	31.20
2.50	39.00
2.75	42.60
3.00	46.50
3.50	54.0

No 8. To T. Carl Haycock
Tenbridge.

Jan 1934

Tests of No. 5 Scale, with initial weight corresponding to a 30 inch (3 lb) tube and 5 ft. (5 lb.) tube placed in the cradle before the weights were added, and with index adjusted to zero.

Weight added	Computed reading	3 lb. initial Wgt.	5 lb. initial Wgt.
1 lb.	15.65	15.50	15.50
2 lb.	31.30	31.30	31.30
3 lb.	46.95	47.30	47.00
4 lb.	62.60	63.00	63.00
5 lb.	78.25	78.80	78.00
6 lb.	93.90	94.40	94.00
7 lb.	109.55	109.10	109.60
8 lb.	125.20	125.00	125.00
9 lb.	140.85	140.10	140.00
10 lb.	156.65	155.50	155.50

2.65# initinial wt.

0.20	3.0
0.40	6.1
0.60	9.3
0.80	12.6
1.00	15.5
1.20	18.5
1.50	23.5
1.75	27.6
2.00	31.5
2.50	39.5
2.75	43.2
3.00	47.2
3.50	55.0

Thos. Toye
Jiggs.

Tests of No. 4 Scale, with initial weight corresponding to a 30 inch (3 lb) tube and 5 ft. (5 lb) tube placed in the cradle before the weights were added, and with index adjusted to zero.

Weight added	Computed reading	3 lb. initial Wgt.	5 lb. initial Wgt.
1 lb.	15.65	15.10	15.25
2 lb.	31.30	31.00	31.25
3 lb.	46.95	46.40	46.60
4 lb.	62.60	62.00	62.00
5 lb.	78.25	77.80	77.80
6 lb.	93.90	93.50	93.50
7 lb.	109.55	109.25	109.40
8 lb.	125.20	125.00	125.00
9 lb.	140.85	140.85	140.85
10 lb.	156.65	156.40	156.50

2.65# initial wt.

.20	3.0
.40	6.0
.60	9.2
.80	12.5
1.00	15.3
1.20	18.6
1.50	23.6
1.75	27.8
2.00	31.5
2.50	39.0
2.75	43.2
3.00	46.8
3.50	54.6

L.E. McKenzie
Lansville.

November 11, 1940

James C. Marr
Irrigation Engineer
P. O. Box 835
Boise, Idaho

Dear Marr:

Can you not send three snow sampler sets to the following addressees for the reasons given below?

(1) J. J. McHutt, District Ranger, U. S. Forest Service, Las Vegas, Nevada, for use in the study of the relation of snow cover on Charleston Mountain to artesian flow in the surrounding region. This is an extension of your plan of studying the relation of springs to soil moisture and forecast correction factors. This plan was suggested at the Seattle meeting. Carl Elges will return from the Humboldt by way of Ely and Las Vegas and plans to lay out a snow survey course this autumn.

Merrill Bernard may be requested to erect a battery of precipitation gages there and has expressed his willingness to provide the snow sampler. I feel, however, that it is best for the Division of Irrigation and cooperating Experiment Stations to direct the project.

(2) Dr. Phil E. Church, Assistant Prof. of Geography and Meteorology, University of Washington, Seattle, is willing to continue measurements at Snoqualmie Pass if provided with snow sampling apparatus. While this work is primarily the study of the evolution of the snow cover, it can also be joined with the snow survey system in the Yakima Basin and provide key measurements for forecasting. He will, of course, plan to make the measurements the first of the month when similar measurements are made elsewhere in the Yakima.

While this work of Phil Church could be joined with the Army work at Mount Rainier, where the Weather Bureau has started cooperative surveys, it will again be better to keep it as a part of pure research in connection with the forecasting of water supplies. Mr. McLaughlin at a personal conference in September heartily approved of the granting of the snow samplers for the above purposes.

(3) Charles W. Miller, National Park Ranger, Hawaiian National Park, T. H./has been active during the past two years with the Nevada Agricultural Experiment Station studying tree rings and runoff, has offered to take snow measurements of the snow on his monthly ascents of the mountains of his district. There is an opportunity here to study the characteristics of oceanic snow as compared with continental.

While this is not so immediately practical as the other projects, it is fundamental to the complete understanding of snow in all of its environments. I am sending a copy of this letter to the Regional Engineer of the U. S. Park Service at San Francisco to obtain his full approval. Of this, however, there should be no doubt, for he has shared in the Snow Survey Conferences at Los Angeles, Stanford, and Seattle, and is, therefore, keenly interested in the work.

We are now trying to finance the reprints of the Stanford, Seattle, and Sacramento meetings. Although three parts are being offered, the price of only two parts at $.50 each, distributed over two years, is requested. Could you not aid us in your region in obtaining orders for 50 copies each from cooperating organizations, including the Idaho Agricultural Experiment Station and Idaho State Engineer?

A copy of the contents of the three parts is inclosed and several copies are being sent you separately.

All best wishes,

J. E. Church

J. E. Church, Meteorologist
Agricultural Experiment Station

JEC:m

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Water Resources Division
Surface Water Branch

March 16, 1951

526 Federal Bldg.,
P. O. Box 948,
Albany 1, N. Y.

Dr. J. E. Church,
Nevada Agricultural Experiment Station,
University of Nevada
Reno, Nevada

Dear Dr. Church:

Undoubtedly you will be interested to know that the Eastern Snow Conference had a very satisfactory meeting at Lake Placid, N. Y., despite somewhat icy highways and temperature of -22° (first morning). The greetings of the Western Snow Conference from Homer Stockwell and Marvin Diamond were much appreciated, as was Dr. Gerdel's paper about the Snow, Ice, and Permafrost Research Establishment at St. Paul.

The section of snow sampler equipped with the snow and ice cutter, as developed by Mr. Ryan, was displayed and examined most carefully by many of the members. It appears to have some advantages, especially for cutting through ice crusts. We thank you for sending us this sampler, and it is now being returned under separate cover.

Yours very truly,

Hollert R. Tear

Hydraulic Engineer.