Record of Stevens W.

~~B~~ July 26, 1943. ~~Renovated~~ Remodeled weigh-beam installed. Batteries inspected.

July 27 - Oct 1. No precip, ~~no~~ evaporation. Trace a straight line.

Oct 7 - Dec. 5. Comparison of No. 1 gage and No. 2 Stevens W. (in. water equiv.)

~~No. 1~~

Oct 7 No. 1 0.08 ; No. 2 0.0
" 8 etc

Feb. 10, 1944 Unruled sheet with stylus replaced by ruled sheet and siphon ink-pen.

Mch. 18 - Pen moved without probable cause ~~when date was marked~~ on the sheet.

" 19 - Test of batteries by Ervie Mason. ~~Motor batteries~~ ~~[illegible]~~ 22 volts, heater 0.

Apr. 5 No. 1 0.35 in. ; No. 2 0

" 11 When clearing snow from door of Stevens W the motor recorded 0.34 in. But during past 13 hrs 1.40 in in a series of steps but some rather long.
Can the shake-down this evening of 0.34 in. possibly be the final increment that had not earlier

been recorded?

Total catch of three storms No. 7 (Stevens Q) 2.13 in.; No. 2 (~~Stevens W~~) 2.18 in. ~~In present storm~~ No. 7 1.25 in., No. 2 1.40 in.

Apr. 14 Stevens W is recording much in detail. The ~~differences~~ divergence in size of steps may represent internal friction. The knife edges of the fulcrum look rusted.

~~The details are numerous~~:

The individual steps are numerous: and represent inches water equivalent:

~~April 11-12~~ Apr. 11-12 — 0.38, 0.50, 0.10, 0.30, 0.12, 0.30, 0.28, 0.16, 0.08, 0.08, 0.08, 0.24, 0.06, 0.02, 0.08.

Total 2.78 in.; No. 1, 1.63 in.; No. 5 (Friez) 1.83 in.

Ap. 15-16 — 0.04, 0.16, 0.06+, 0.06+, 0.06+, 0.08, 0.08, 0.08,

Total 0.62 in.; No. 5 (Friez) 0.54 in.

Apr. 19-20 No. 2 (Stevens W) 1.38 in.; No. 1, 1.12 in.; Stevens S, 1.22 in.; No. 5 (Friez) 1.33 in.; No. 7 (Stevens Q), 1.25 in.

The pen movements of No. 2 (Stevens W) Apr. 19-20 were 0.04, 0.08, 0.08, 0.06, 0.06, 0.08, 0.06, 0.06, 0.08, 0.06, 0.08, 0.08, 0.08, 0.08, 0.08, 0.12, 0.04, 0.04, 0.04, 0.08

Total 1.38 in. average length of step 0.069 in.

~~Greatest sensitiveness~~ 0.04 in.

Apr. 21. precip. 0.06 in.; No. 5 (Friez) 0.0.

The wire cables should cause no friction but the knife-fulcrum on the balance looks rusty.

Apr. 2~~7~~-28 – No. 2 (Stevens W) 0.04, 0.06, 0.04. Total No. 2, 0.14 in.; No. 1, 0.13 in.; No. 5 (Friez), 0.17 in.

May ~~4~~ 6 – Record of No. 2 (Stevens W) 0.03 in., 0.06, 0.04, 0.04, (almost ~~a~~ a continuous slanting line), 0.08. Later in evening 0.08 in., 0.08 ~~in~~ Total 0.74 in.; No. ~~5~~ (Friez), 0.65 in.

On May 4, pen moved 0.04", 0.04" three hours apart. Total 0.08" in.; No. 5 (Friez) 0.0.

June 23 – July 2. No. 2 (Stevens W), -0.04 in.; No. 1, 0.0 in. (Showers); No. 5 (Friez) 0.0. The -0.04 in. may possibly be the reversal of the pen at the turn of its chain-drive, and therefore be +0.04 in. This reversal is evident on July 12 in a movement of 0.04 in. But why the movement? Pen assisted by jarring?

July 29. Pen moved 0.98 in. when observers climbed the platform. Did the jarring ~~give the impulse~~ overcome friction that held the weighbeam from recording?

Aug. 1 - Test of Sensitivity

Washers let down into storage tank.

0.01 in. water equiv. = 0
0.03 " = 0
0.06 " = 0
0.09 " = 0

Aug. 18 - Final Test (approximate) of No. 2 (Stevens W).

a total weight of 12 ozs in increments, as 2 oz., 4½ oz., 9½ oz., 12 oz., equaling 0.412 in. water equivalent, moved the pen only 0.28 in., and reversed only slightly when the weights were withdrawn.

There was no warning sound of the motor when the increments were being lowered and therefore no observation of the specific weight that tripped the pen. ~~But the~~ Since there was no time to repeat the test, the total must be taken. The total ~~inches~~ catch, represented by the weights, was 0.412 in. but the pen movement was only 0.28 in. or three fourths of it.

Stevens W is plainly stiff.

Sep. 7 - Cleaned fulcrum with a wash of kerosene. Ernie Mack suggests that the oil well may be at fault. At least, the weigh beam recovers equilibrium slowly when pressed far down or up.

J E Church.

Paint

Quigley's AAA (Aqua, acid, alkaline resistant). Black Paint for inside and outside of gages.

White or grey paint best in hot locations to reduce evaporation. But where cold, the original copper metal or galvanized metal painted black is essential to melting adhering snow or ice.

NB:--Galvanized iron should be cleaned with vinegar to assure adhesion of paint.

Likewise grooves in numbers on snow samples should be cleaned before filling with red pigment.

Get: knapsack for tools.

Hygrothermograph

Dec. 9--Clock No. 291412

Can brass mesh be placed around case to prevent snow clinging to hairs and distorting record? Ashton Codd has placed mosquito mesh entirely around the inside of the thermometer shelter.

Psychrometer Dry 39°F Wet 35°F

Snow Melting

Wind 24 hrs--35 mi. total.

Overcast, calm

Barometer 23.76 in; at 1:50 p.m. 23.78 in

At 35°F snow melting.

(Note.--If sky clear, snow freezes at 35°F. Crystal size 1 m.m. or smaller. Shrinking because of melting? Some cohesion.

Melting on Needles of Pines

Snow dripping, cohesive. Rests on top of needles, loose. Retracted or melted above needles. Warmth of needles? Try thermometer bulb in green foliage and under snow, then in sun or shade free from insolation effects.

Snow Melting:

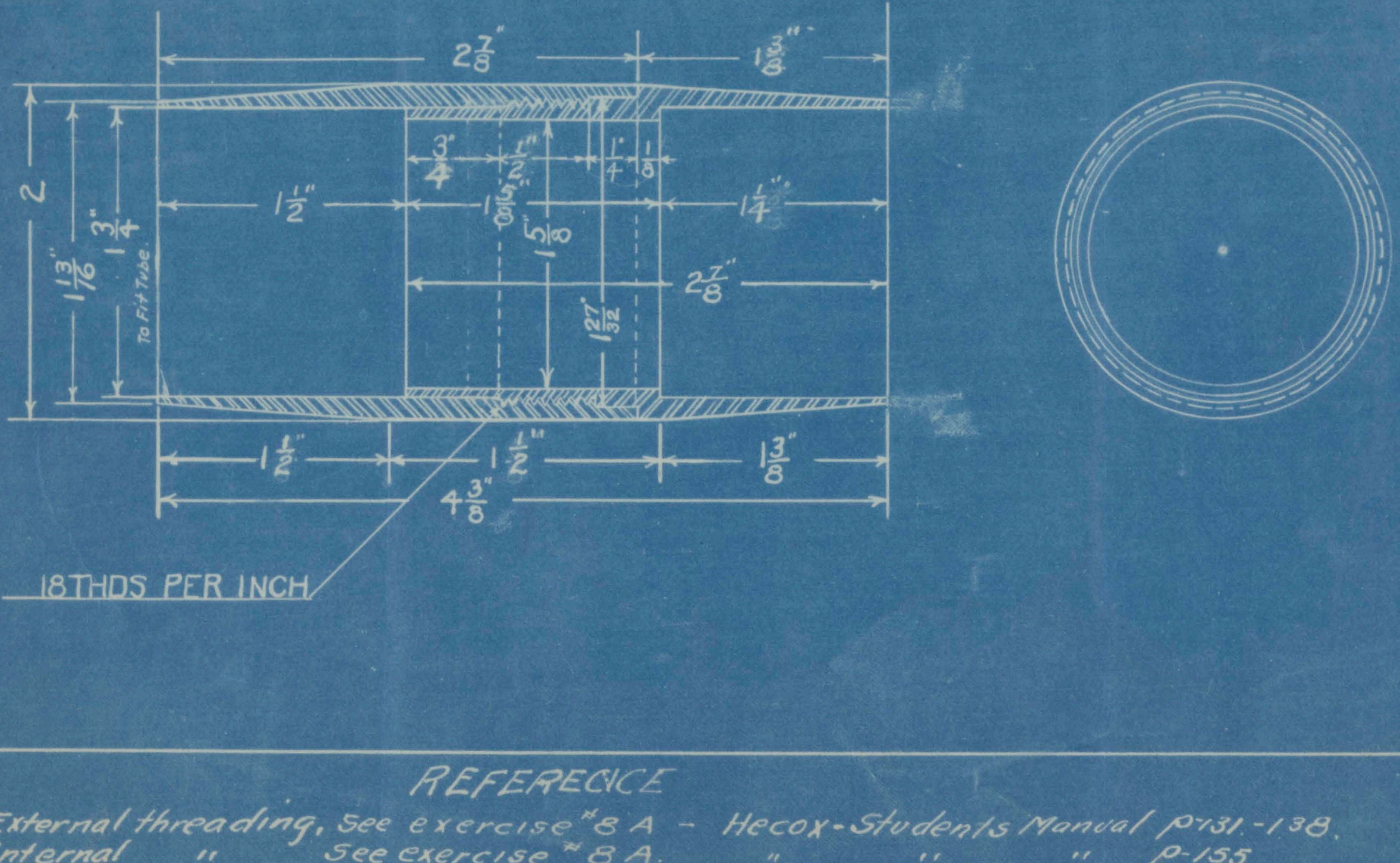
Dec 9 10 a.m. Temp. 35°F, overcast, melting. 4:30 p.m. Temp. 38.8°F. Clouds 50% (Airways: overcast or broken) or clouds thin overhead (cirrus). Relative humidity 98% (?)

snow freezing--Crust now 0.35 in. (amount or depth of melting for the day). 5 p.m. fog forming over lake.

4:30 p.m. Temp. in shelter 35°F
Temp. on snow 0.3 in. above surface 31°F.

5:00 p.m. Temp. in shelter 34-°F
" on snow 29.0+°F

March 22-20 ∙ March 24-20
AWP. AWP.



UNIVERSITY OF NEVADA
RENO, NEV.

TIME ALLOWED

CLOCK | POINTS

3-18-A

MACHINE

SNOW SAMPLER
COUPLING.

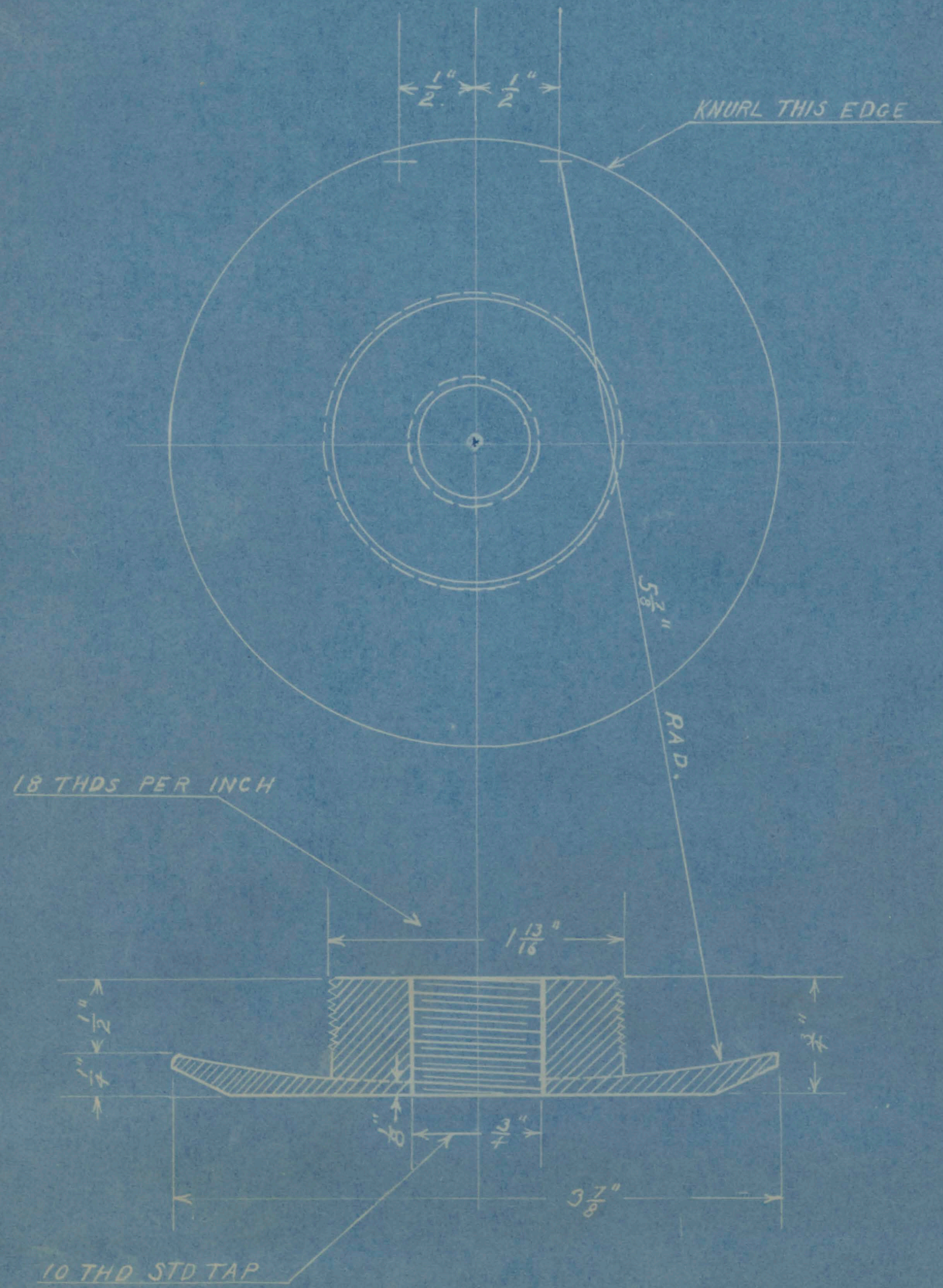
MATERIAL
Mach. Steel
TUBING
1 1/2 O.D. x 1 1/4 I.D. x 6 1/2"

LOCATION
Bin 3-18

REFERECICE

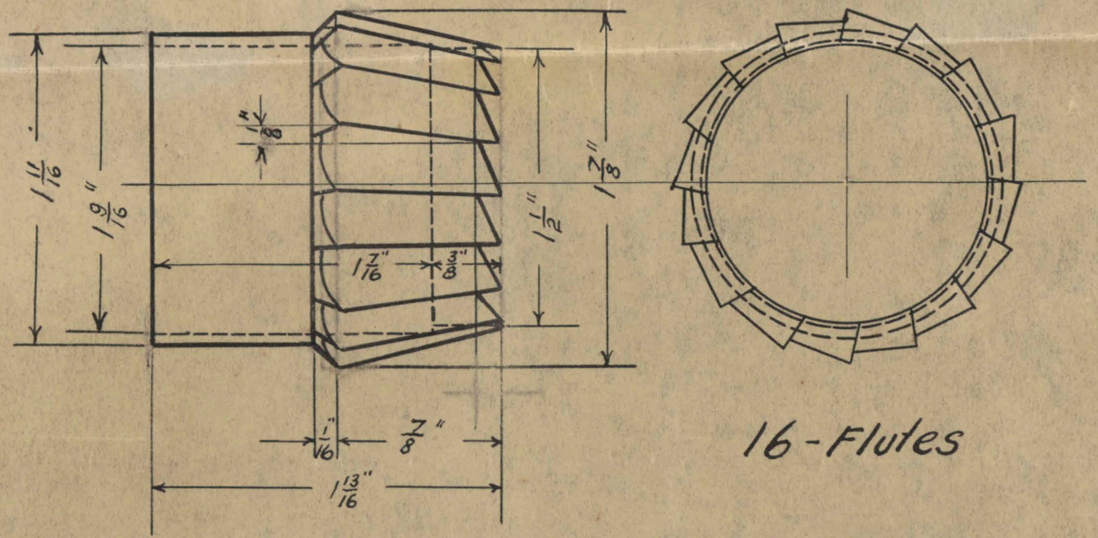
External threading, See exercise #8 A - Hecox - Students Manual p. 131 - 138.
Enternal " See exercise #8 A " " " p-155

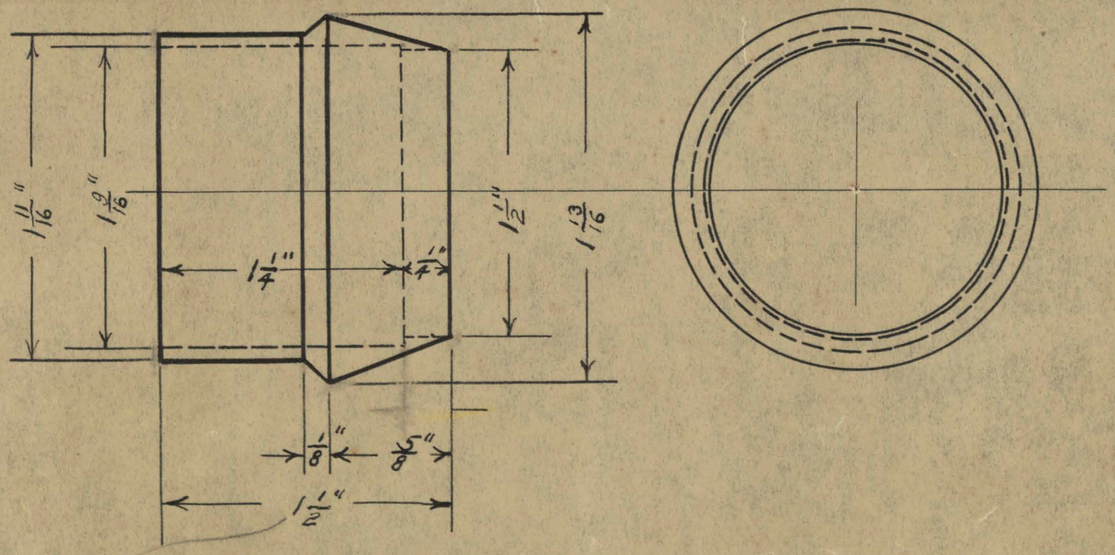
TIME ALLOWED		UNIVERSITY OF NEVADA RENO, NEV.	MATERIAL
CLOCK	POINTS		Mach. Steel
3-18-E		MACHINE	
		SNOW POLE BUTTON	LOCATION
			TOOLS



REFERENCE.

TIME ALLOWED		UNIVERSITY OF NEVADA RENO, NEV.	MATERIAL
CLOCK	POINTS		Tool Steel
3-18-D		MACHINE SNOW CUTTERS	LOCATION
			TOOLS

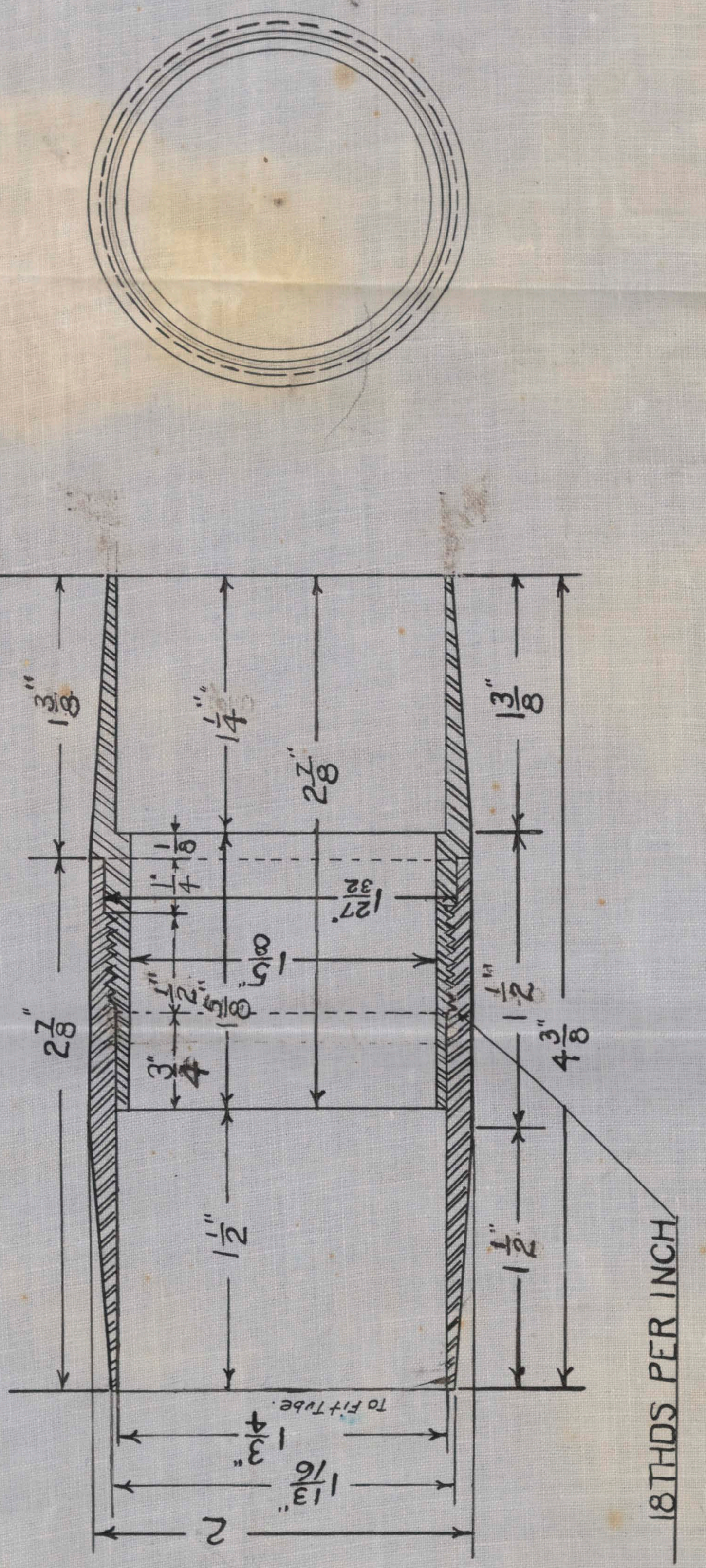




REFERENCE.

To be tempered.

TIME ALLOWED		UNIVERSITY OF NEVADA RENO, NEV.	MATERIAL
CLOCK	POINTS.		Mach. Steel Tubing 1 1/2 I.D. x 2 1/8 O.D. x 6 1/2"
3-18-C		MACHINE	LOCATION
		SNOW SAMPLER COUPLING.	Bin-3-18

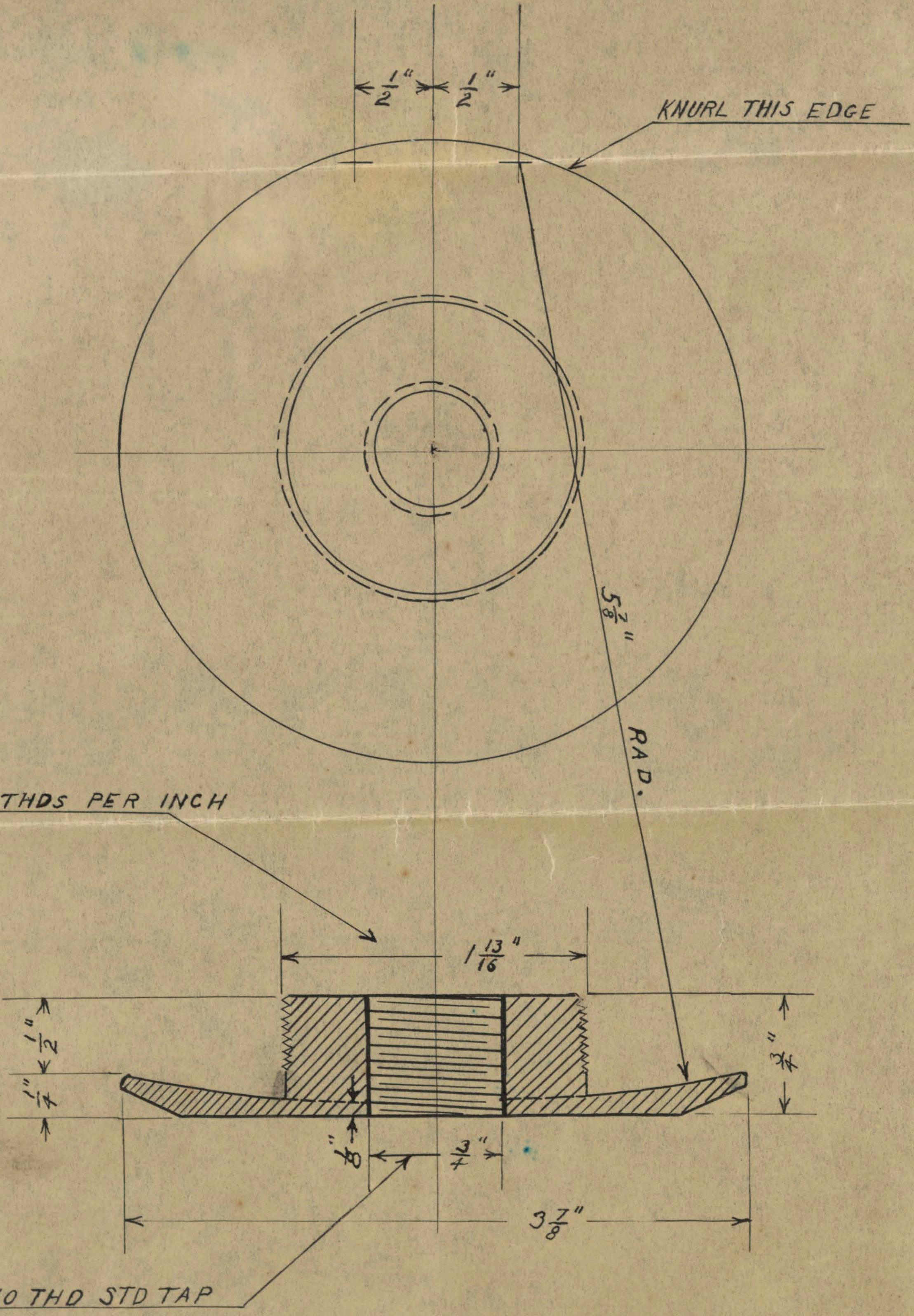


REFERENCE

External threading, See exercise #8A - Hecox - Students Manual p-131-138.
External " See exercise #8A " " " p-155

March 22-20 AWP
March 24-20 AWP

TIME ALLOWED		UNIVERSITY OF NEVADA RENO, NEV.	MATERIAL
CLOCK	POINTS		Mach. Steel
3-18-E		MACHINE	
		SNOW POLE BUTTON	LOCATION
			TOOLS



REFERENCE.

A W Preston
Univ of N. D.
Grand Forks
N. D.

GRAND FORKS, N. DAK.
NOV 1
6 - PM
1936

AIR-MAIL
SAVES

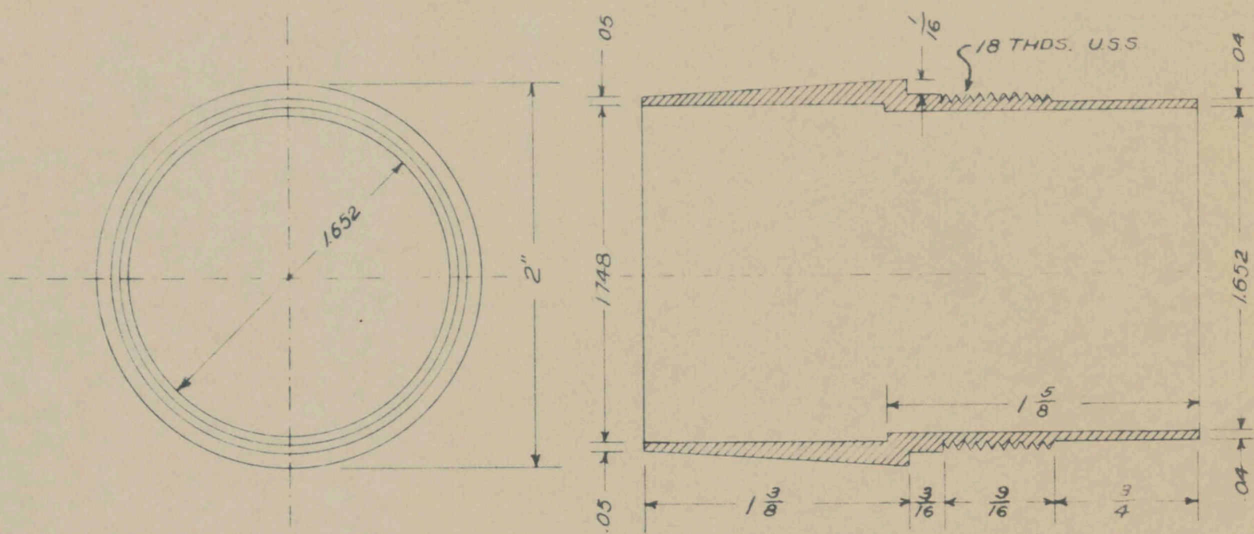
Mr J. E. Church
Univ of Nevada
Reno
Nevada

— SNOW. —

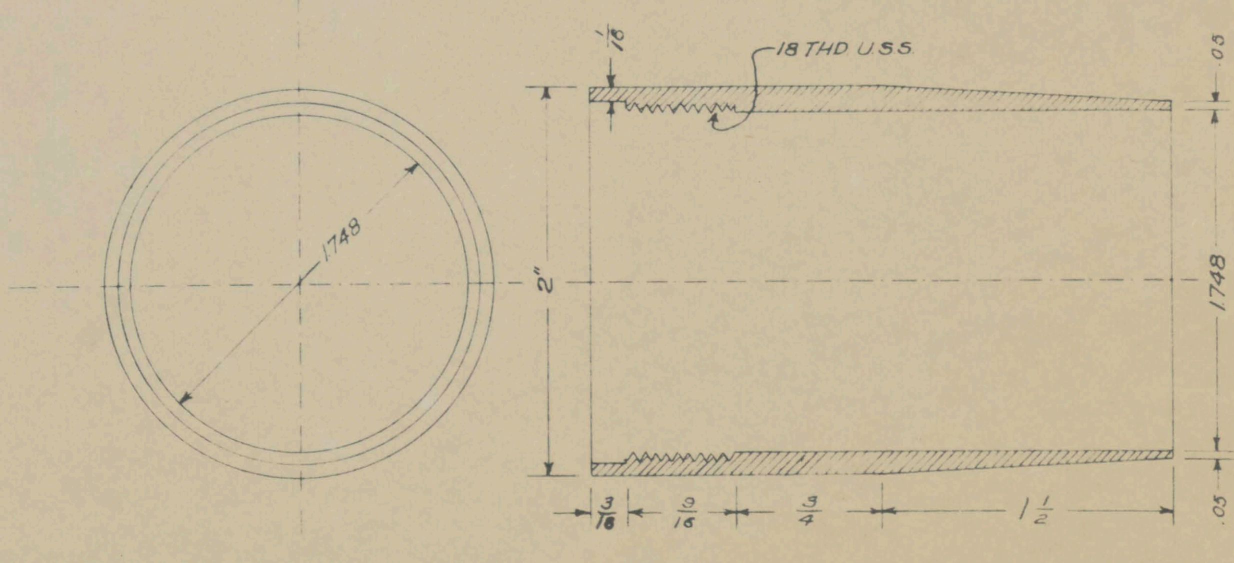
Old tracings
of Snow cutter,
Coupling etc

ALUMINUM COUPLING
FOR
MT. ROSE SNOW SAMPLING TUBE

FULL SCALE



MALE



FEMALE

UNITED STATES DEPARTMENT OF AGRICULTURE
Bureau of Agricultural Engineering
Division of Irrigation

Box 835, Boise, Idaho

March 25, 1937

MEMORANDUM: REGARDING ELECTRIC WEIGHING SCALE FOR SNOW SAMPLER

There is enclosed herewith a rough sketch of an electric weighing scale which, either as suggested or in some modified form, may improve the accuracy attainable in weighing snow cores. It is requested that the design be criticized and suggestions for improving it be made.

The fundamental principle involved is the translation of a force applied to a carbon compression-pile into an electric current, as indicated in the accompanying schematic diagram and sketches.

The sketch of the side view in section shows the method of transmitting the force from the weighing platform to the compression pile through a pair of rigid supporting columns and a compression spring. Certain refinements, such as the use of transverse corrugations in the sheet of spring metal and improved methods of mounting, will suggest themselves to the experienced designer; the intent being to show only the general construction of the proposed device.

During operation, the empty snow-sampling tube would be placed on the scale platform, the push-button depressed, and the electric bridge balanced by rotation of the rheostat. The sampling tube then would be removed from the scale platform, the sample taken, the tube replaced on the platform, and the meter reading again noted.

Use of the balanced bridge type electrical circuit permits self calibration in the sense that each time a reading is taken, the empty tube becomes the reference weight against which the null-point adjustment is obtained. This minimizes inaccuracies due to disturbing the mechanical assembly in transit, change of battery e.m.f. with ageing and temperature, and change of resistance of the component parts.

The two factors having the greatest effect upon accuracy are the linearity of the pressure-resistance characteristic of the compression pile, and the uniformity of meter calibrations.

The principle of using these devices for measurement of fluid height in closed tanks has been used extensively, and it is felt that sufficiently accurate ones are commercially obtainable.

Production-run milli-ammeters of the type proposed are guaranteed accurate within 5% of the full scale rating, and are generally better than this. If necessary for this application, accuracies to within 1% are obtainable on order.

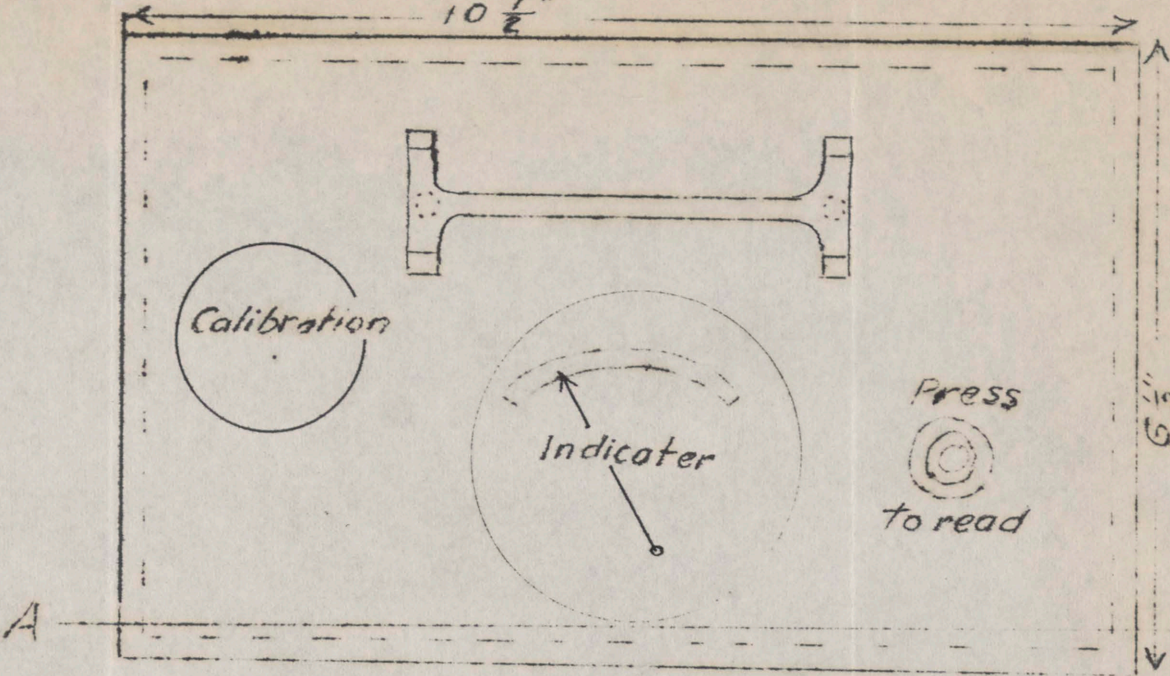
Flashlight dry-cells, when used in this device, should have a period of service approximating the shelf life, as the use-factor and current drain are both low.

Very truly yours,

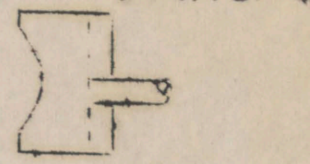
James C. Marr

James C.Marr,
Associate Irrigation Engineer.

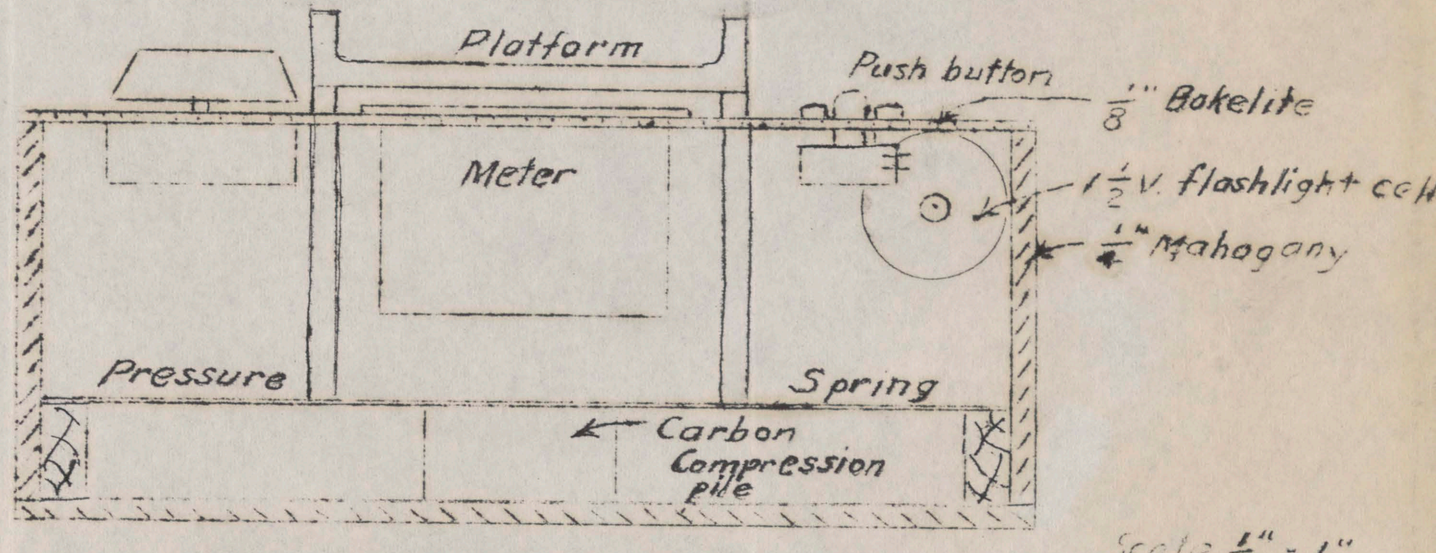
SELF-CALIBRATING ELECTRIC SCALE



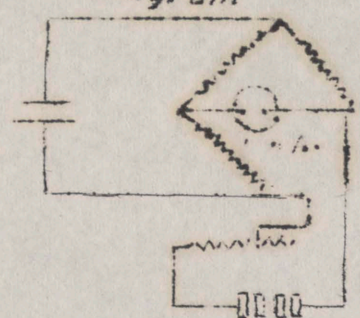
Section of Platform



Section thru A-A



Sthematic
Wiring
Diagram



Scale 1/2" = 1"

Improvements in Snow Survey Apparatus
James C. Marr

ELECTRIC WEIGHING SCALE FOR

SNOW SAMPLER

By

James C. Marr

James C. Marr

SUPPLEMENT I

At best the spring balance is a crude device for determining weight, but when it is subjected to all sorts of weather and abuse, such as are prevalent on snow survey work, it can be expected to give erratic results as well. In view of these inherent shortcomings of our present weighing scales for snow sampling equipment, it is expedient that other means for weighing snow cores be conceived and tried out. As a preliminary step in this direction an electrical scale, illustrated more or less diagramatically in Figure 1, is suggested.

The fundamental principle involved is the translation of a force applied to a carbon compression-pile into an electric current, as indicated in the accompanying schematic diagram and sketches.

The sketch of the side view in section shows the method of transmitting the force from the weighing platform to the compression pile through a pair of rigid supporting columns and a compression spring. Certain refinements, such as the use of transverse corrugations in the sheet of spring metal and improved methods of mounting, will suggest themselves to the experienced designer; the intent being to show only the general construction of the proposed device.

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The two factors having the greatest effect upon accuracy are the linearity of the pressure-resistance characteristic of the compression pile, and the uniformity of meter calibrations.

The principle of using these devices for measurement of fluid height in closed tanks has been used extensively, and it is felt that sufficiently accurate ones are commercially obtainable.

Production-run milli-ammeters of the type proposed are guaranteed accurate within 5% of the full scale rating, and are generally better than this. If necessary for this application, accuracies to within 1% are obtainable on order.

Flashlight dry-cells, when used in this device, should have a period of service approximating the shelf life, as the use-factor and current drain are both low.

Some of the disadvantages of this device, as compared to the spring-scale and beam-scale are:

1. Greater cost.
2. Greater bulk and weight.
3. Necessity for battery replacement.

4. Base on [illegible]?

The advantages are:

1. Greater accuracy.
2. Lack of exposed moving parts.
3. Ease of calibration.
4. Lack of jewelled or hardened bearing surfaces.
5. Ease of operation during high winds.

Brief Summary of

"A New Method of Estimating Stream Flow, based upon a New Evaporation Formula,"

By J. A. Folse. Carnegie Institution of Washington Publication 400, 1929

This volume reports upon the second phase of an investigation of the laws governing stream-flow, which was begun in 1911 under the direction of the late Dr. John F. Hayford, and financed by the Carnegie Institution of Washington. A report (Publication 317) was issued in 1922 covering the progress made from 1911 to 1922. Publication 400 covers the work accomplished from 1922 to 1926, inclusive.

The outcome of the second part of this research project (as reported upon in Publication 400) may be briefly stated as follows:

(1) An evaporation formula has been derived, based upon over 700 observations independently on each of two of the Great Lakes, Michigan-Huron and Superior. This formula enables one to estimate the daily rate of evaporation from any free, open surface of water (such as from the surface of a lake, resevoir or river) anywhere in the world, in terms of the meteorological elements of air temperature, vapor-pressure and wind velocity as ordinarily observed at the standard U.S. Weather Bureau stations.

(2) An estimate has been made of the constant part of the run-off into each of Lakes-Michigan-Huron and Superior from their respective land drainage areas, and certain general knowledge with reference to the variable parts of the run-off in each case has been obtained.

(3) As a direct sequel to the results already published in Publication No. 317, and as a necessary precursor of Item (1), the following two items of knowledge have been derived:

(a) A reasonably accurate numerical expression has been obtained for the effects of barometric pressures on the elevation of the water surface at the Marquette station on Lake Superior. With this expression one may compute, from the distribution of the barometric pressures ordinarily

(a) Continued

shown on the forecast maps of the Weather Bureau, the disturbances in elevation of the water surface thereby produced at Marquette.

(b) The numerical constants (the Σ's) in the general formula for wind effects stated as equation (69), page 63, Publication No. 317, have been derived for the Marquette station on Lake Superior. These constants enable one to compute the hourly or daily effect of a wind of any velocity and direction upon the elevation of the water surface at Marquette, Michigan.

(4) The relationship of the new knowledge gained in (1) and (2) to various important problems in science and engineering has become increasingly evident. Some of these problems are:

(a) The problem of estimating the evaporation from the surface of each of the Great Lakes as a basis for more accurate estimates of the hydrological phase of the problem of regulating the surfaces of the lakes by controlling works in their connecting channels, and the use of this available knowledge of the daily evaporation in such regulation after the controlling works are constructed.

(b) The problem of estimating the evaporation from other large open surfaces of water, such as the surfaces of reservoirs, lakes and rivers, in the design of controlling works for power, irrigation, navigation and sanitation.

(c) The problem of estimating the evaporation from large land surfaces as a basis for estimating the run-off from such surfaces for use in various engineering and scientific problems.

(5) Approximate quantitative expressions of the fundamental laws of flow of two streams, A and B, Wagon Wheel Gap, Colorado, have been derived. These numerical expressions enable one to compute the daily flow of these two streams from the observed weather elements of wind velocity, air temperature, vapor pressure, rainfall and snow gagings with a reasonably good degree of approximation.

(6) The general method has been developed by which such expressions can be derived for any stream anywhere in the eastern two-thirds of the United States where the annual rainfall is 20 inches or more from parallel observations of stream flow, as measured by the United States Geological Survey, or otherwise, and from the meteorological elements as observed by the Weather Bureau.

(7) The relation of the new knowledge stated in (5) and (6) to three important problems has become evident. The three problems are:

(a) The problem of increasing the length of record of flow of a stream, the hydrograph, as a basis for greater accuracy in the design of works for power, irrigation, sanitation and navigation.

(b) The problem of forecasting the flow of a stream as a basis for increasing the economy of operation of hydro-electric power plants; and to reduce the damage from floods.

(c) The problem of determining the effect of forest cover on the run-off from watersheds.

To here

JAFolse.
J. A. Folse
Curator, Department of Power
Museum of Science and Industry, Chicago
May 3rd, 1937

JAF/nm

Begin

Brief Summary of
"Effects of Winds and of Barometric Pressures on the Great Lakes", by John F. Hayford, Carnegie Institution of Washington Publication 317, 1922

This volume should be of interest to hydrologists, engineers and physicists, not only because it represents an outstanding contribution to existing geophysical knowledge which has definite practical applications of considerable importance, but because of the unusual methods employed in the analysis.

The volume represents a partial report on a much broader investigation which had for its ultimate object a better formulation of the laws governing the amount of stream flow than the engineering profession then had. This broad investigation was begun in the summer of 1911 under the direction of the late Dr. John F. Hayford, then dean of the School of Engineering of Northwestern University and formerly chief of the Computing Division of the U.S. Coast and Geodetic Survey; and was financed by the Carnegie Institution of Washington. The investigation was carried on continuously, except for two years of the Great War, from 1911 to the time of Dr. Hayford's death in 1925. The work accomplished after 1922 was published in 1929 as Publication No. 400 of the Carnegie Institution of Washington, entitled "A New Method of Estimating Stream Flow based upon a New Evaporation Formula", by J. A. Folse.

The unusual methods of analysis used in this research are stated on pages 6-8 of Publication 317, and can not be repeated here for want of space. These methods are applicable to a great many problems in engineering, "pure" science, economics, et cetera, and should be of interest to those concerned.

The results of the research reported upon in Publication 317 are stated on pages 8 and 9. These are:

"(1) Reasonably accurate numerical expressions have been obtained for the effects of barometric pressures on the elevation of the water surface at the five stations, Buffalo, Cleveland, Milwaukee, Mackinaw, and Harbor Beach, on Lake Erie and on Lake Michigan-Huron. With these expressions, one may, from the distribution of barometric pressures ordinarily shown on the forecast maps of the Weather Bureau, compute the disturbances in elevation of the water surface thereby produced at the stations named.

(2) The general method has been developed by which such a numerical expression for the barometric effect at any station on any body of water may be derived from observations of the water elevation at that station and the forecast maps for the same period.

(3) A general expression, including the necessary numerical constant, has been obtained for the effect of winds, of any given velocity and direction, in producing a disturbance of elevation of the water surface at any given station, on any body of water, anywhere in the world. The data required in regard to the station and the body of water are such as are ordinarily shown on good charts, namely, the depths of the water at all points, the location of the shore line, and the location of the station.

(4) Four of the prevailing seiches, or free oscillations under the influence of inertia, on Lake Erie and Lake Michigan-Huron have been isolated. Their periods and probable methods of oscillation have been shown. The relation between these seiches and the uncertainties in daily mean elevations of the water surface at gage stations has been discerned. The appreciation of this relation aids decidedly in obtaining accurate determinations of the daily mean elevation of the mean surface of each lake.

(5) The accuracy with which the elevation of the mean surface of any one of the Great Lakes may be determined for any given day has been decidedly increased. On Lake Erie the elevation of the mean surface of the lake may now be determined as accurately from one day of observation at Buffalo as it was formerly possible to fix it from 16 days of observation at that station. Similarly, the elevation of the mean surface of Lake Michigan-Huron may now be determined as accurately from one day of observation at Mackinaw as it was formerly possible to determine it from 6 days of observation at that station. When one determines the fluctuation of elevation of the mean surface of a lake he thereby determines the fluctuation in the total water-content of the lake.

(6) The relations of the new knowledge indicated in (1) to (5) to four outstanding problems have become evident. The four problems are:

(a) The problem of regulating the elevations of the water surface of each of the Great Lakes -- and the rates of flow through the connecting streams, so as to secure the greatest aggregate benefits to navigation, power, development, and sanitation.

(b) The problem of determining the laws of evaporation from large free-water surfaces such as the surface of the Great Lakes.

(c) The problem of correcting the observed elevations of the water-surface at a tide-gage in such a manner as to remove the disturbances due to winds and fluctuating barometric pressures and thereby to secure a more accurate determination of mean sea-level than could otherwise be obtained from said observations.

(d) The problem of determining the direction and rate of the tilting, which is believed to be in progress, of the land underlying and immediately surrounding the Great Lakes."

J A Folse

J. A. Folse
Curator, Department of Power
Museum of Science and Industry, Chicago
May 3rd, 1937

JAF/nm

— Test by Herz —

Balances sometimes fail to return to original reading by 1/2°.

Shrinking - ~~Sh~~

O.K. for inserting cutter, for latter is entirely cold at that time.
But in withdrawing cutter, it is heated somewhat (even tho dipped in snow) and therefore resists drawing from tube easily. Vise therefore necessary.

Swelling and shrinking does not permanently expand diameter of tube if cutter is not pried back + forth. Metal must not be roughly handled.

Regarding removing cutter shrunk on with heating tube, These can be removed 5 or 6 times if handled carefully, but a vise is necessary to hold cutter securely or a plug and rod to be able to use a certain amount of force, Care must be taken not to stretch the aluminum tube so diameter remains the same when cold.

135 inches with 12½ ft tube
119 " " 15 " "
103 " " 17½ " "
87 " " 20 " "

@ 50% density will

weigh 174 inch depth or 14½ ft.

@ 40% will weigh 217.5 inch depth

or 18.1+ ft.

when only 17½ ft of tubing are used then at 50% density one is able to measure a depth of 17½ feet.

THE NEWEST AND MOST COMPLETE
MODERATE PRICED HOTEL IN DENVER

200 ROOMS
EUROPEAN PLAN

HOTEL Auditorium

W. L. BEATTIE
PROPRIETOR AND MANAGER

FOURTEENTH AND STOUT STS.

DENVER, COLORADO

Scales with 12.5 feet capacity

After putting on 2.15 lb weight to bring it to zero the scale measures as follows.
(2.15 lb is equivalent to two 2½ foot sections of sampler, one having cutter end)

	actual Wt.	Ideal Wt.	Discrepancy
½ lb	= 8 inches	8	0
1 "	= 16 "	16	0
1½ "	= 24½ "	24	+½ in
2 "	= 32½ "	32	+½ "
2½ "	= 40½ "	40	+½ "
3 "	= 49 "	48	+1 "
3½ "	= 57 "	56	+1 "
4 "	65 "	64	+1 "
4½ "	73 "	72	+1 "

If 12.5 feet of sampler are put on this scales, reading starts at 49 inches. This much will have to be deducted from readings of inches of water of the core.

(see table on reverse side)

12.5 feet capacity scales

with 12.5 feet of sampler scale reads as follows

empty sampler		= 49 inches	49	0
adding	1½ bb.	= 73 " ~~24~~	73 ~~24~~	0
	2 "	= 81 "	81	0
	2½ "	= 89 "	89	0
	3 "	= 98 "	97	+1
	3½ "	= 106 "	105	+1
	4 "	= 114 "	113	+1
	4½ "	= 122 "	121	+1
	5 "	= 130 "	129	+1

limit of scales is 135 inches.

(capacity approximately 80 inches of water)

The Utah scales has same zero as above scales. –

Scales with 20 feet capacity

After putting on 5.3 lbs (equivalent to 5 two and one half foot sections of sampler including cutter) scale starts at zero.

	Ideal	
1/2 lbs = 9 inches	8	+ 1
1 " = 18 "	16	+ 2
1 1/2 " = 27 "	24	+ 3
2 " = 36 "	32	+ 4
2 1/2 " = 45 "	40	+ 5
3 " = 53 "	48	+ 5
3 1/2 " = 62 "	56	+ 6
4 " = 71 "	64	+ 7
4 1/2 " = 80 "	72	+ 8

If 20 feet of sampler is put on scales reading starts at 52 inches, this to be deducted from reading when measuring snow

(see table on reverse side)

20 feet capacity scales.

With 20 feet of sampler scales reads as follows:-

				Ideal	
Empty sampler	=	52 inches			
1½ lb	=	78 "	26	24	+2
2 "	=	87 "	35	32	+3
2½ "	=	95 "	43	40	+3
3 "	=	105 "	53	48	+5
3½ "	=	114 "	62	56	+6
4 "	=	122 "	70	64	+6
4½ "	=	131 "	79	72	+7
5 "	=	140 " limit of scales.	88	80	+8

BAE No. 348 12.5 FT. (Wt 15½ oz)

Necessary for tension 2.15 lbs = 34.4 in.

	actual (Dial)	Ideal Computed (from Standard wt)	~~Correction~~ Divergence	
Initial	2.0 in.			
	10.2	10.4	− 0.2 in.	
	18.4	18.6	− 0.2	
	22.2	22.3	− 0.1	−0.4
	32.5	32.6	− 0.1	
	51.0	51.2	+ 0.2	
			?	

Parshall Model. (Wt. ~~15½~~ 18 oz Total Range 100 in.

Necessary for tension —

Initial	39.1			
tension	10.4	10.4	0	
good at 4 in.	18.9	18.6	+0.3	
~~+ returns exactly~~	22.9	22.3	+0.6	−0.8
within ½ in.	32.5	32.6	−0.1	
1.02	51.1	51.2	− 0.1	

2.15
16
1290
215
3440.

96

96
~~32~~
64

5×1.08 = 5.06

12.5 ft = ~~49 in.~~ 80 in.

Reserve copy 20 in.

=

at 40% max. = 50 in max.

7.5 ft = 3×1 = 3^II = 48 in.

Bal. 52 in.

at 40% max = 130 in = 10+ ft.

10 ft. = 4×1 = 4 = 64

Bal 36 in. @ 40% = 90 in. = 7½ ft.