UNIVERSITY OF NEVADA
AGRICULTURAL EXPERIMENT STATION
RENO, NEVADA

Genesee Falls Park

Letchworth State Park

OX-BOW BEND—LETCHWORTH STATE PARK

1184-29

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High Banks of Genesee River—near Mt. Morris, N. Y.

1189-29

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The Gorge—Letchworth State Park

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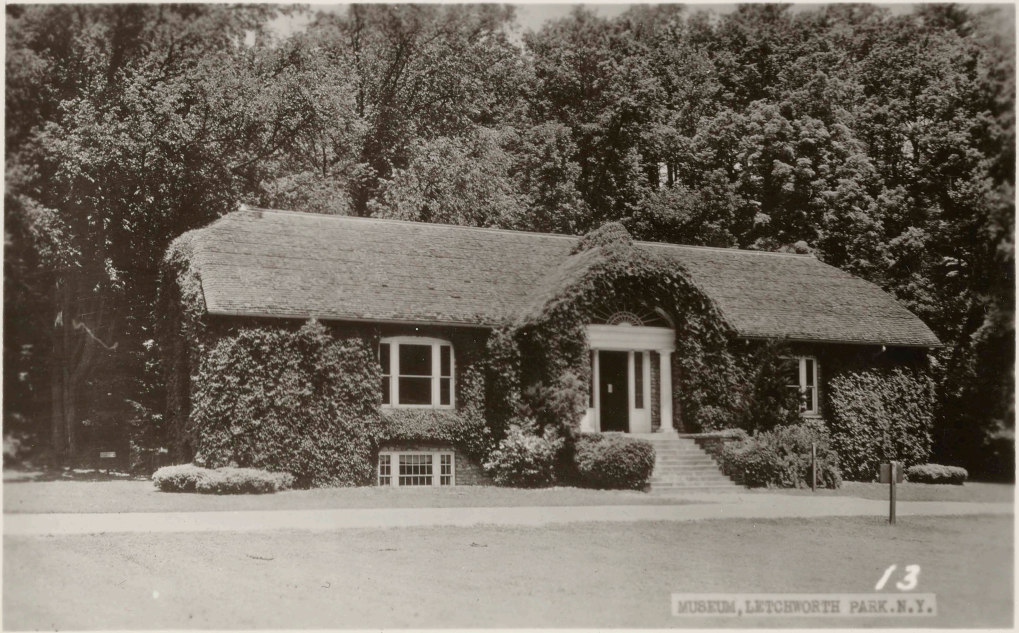
13
MUSEUM, LETCHWORTH PARK, N.Y.

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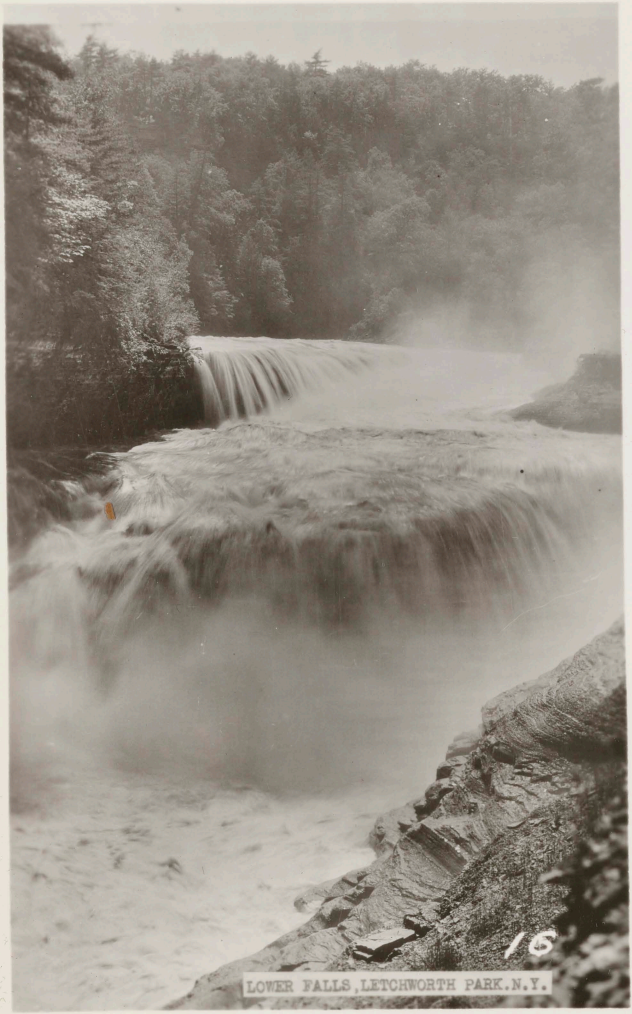
16
LOWER FALLS, LETCHWORTH PARK. N.Y.

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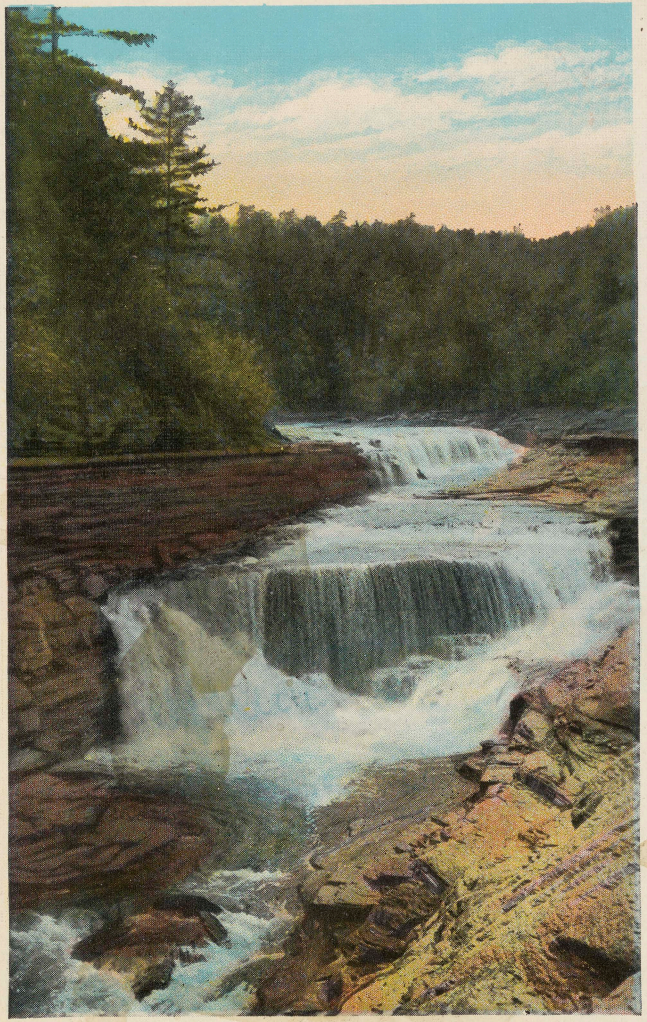
The Lower Falls—Letchworth State Park



1182-29

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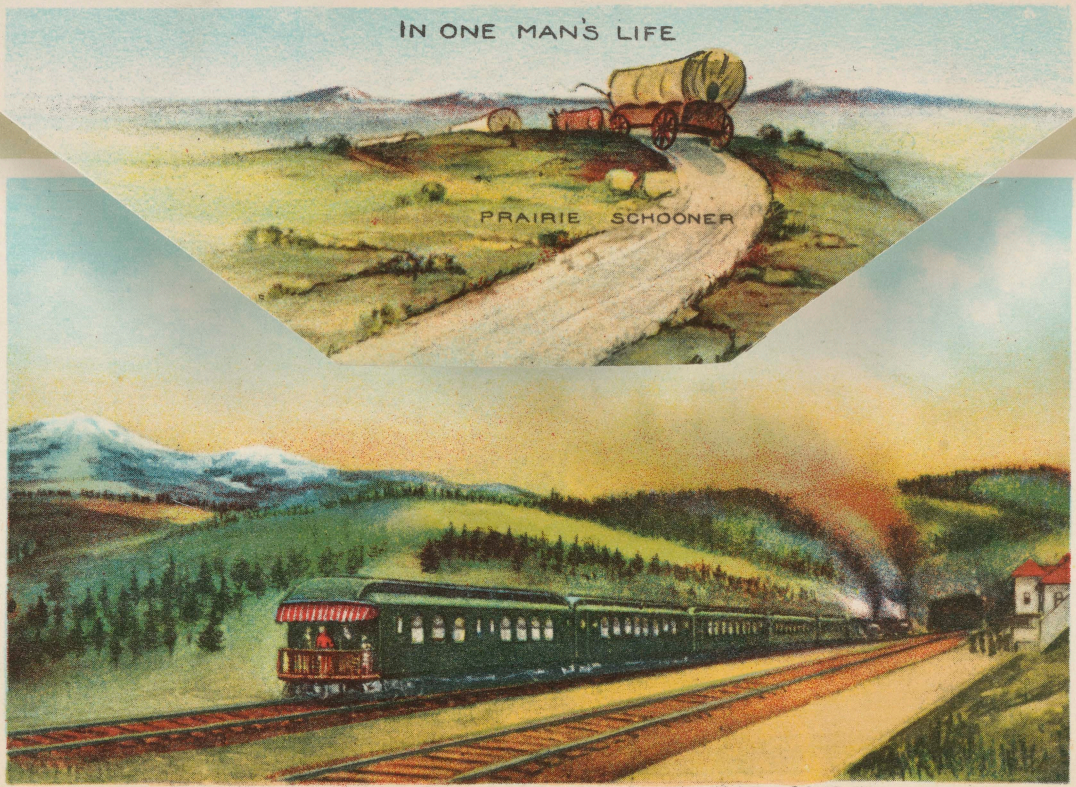
RENO, NEVADA

Oakleaf -
Genesee Falls [?]

UNIVERSITY OF NEVADA
AGRICULTURAL EXPERIMENT STATION
RENO, NEVADA

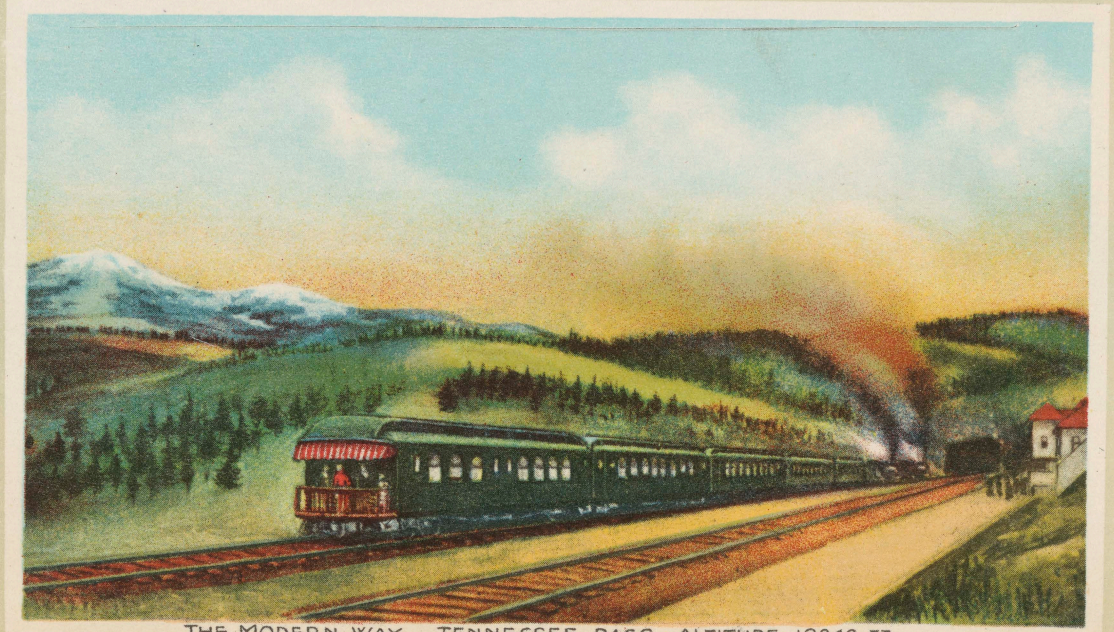
Upper Arkansas River


IN ONE MAN'S LIFE
PRAIRIE SCHOONER
THE MODERN WAY TENNESSEE PASS ALTITUDE 10242 FT.

"SEE AMERICA"

DENVER AND RIO GRANDE

PUB. BY THE INTERSTATE CO.



THE MODERN WAY TENNESSEE PASS ALTITUDE 10242 FT.

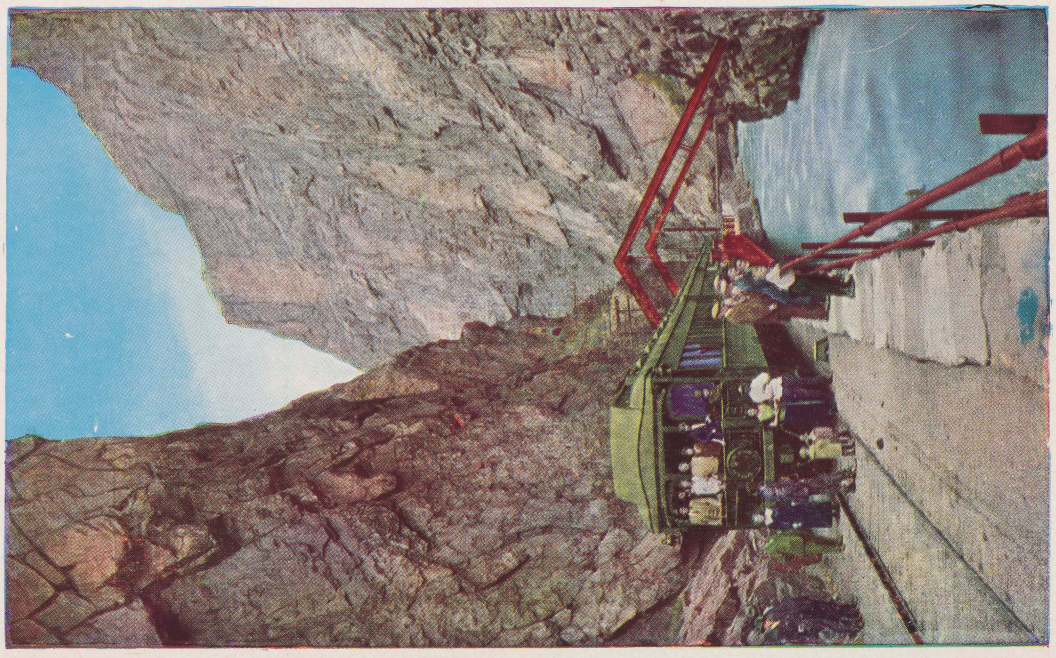
15453. Glenwood Springs, Colorado

DENVER AND RIO GRANDE

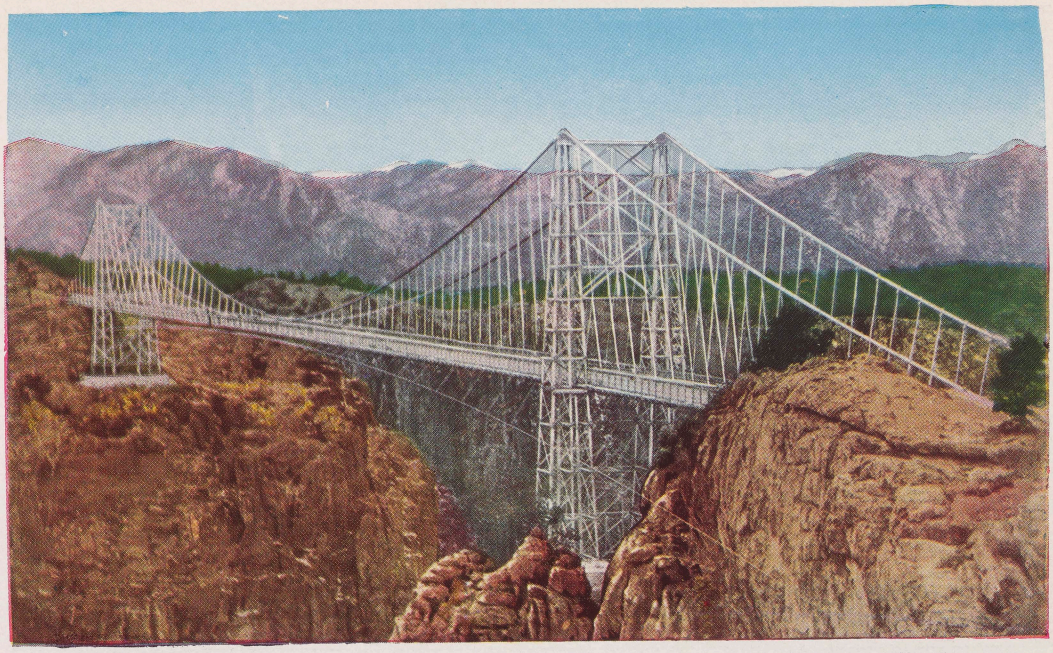
"SEE AMERICA"

"SEE AMERICA"

DENVER AND RIO GRANDE



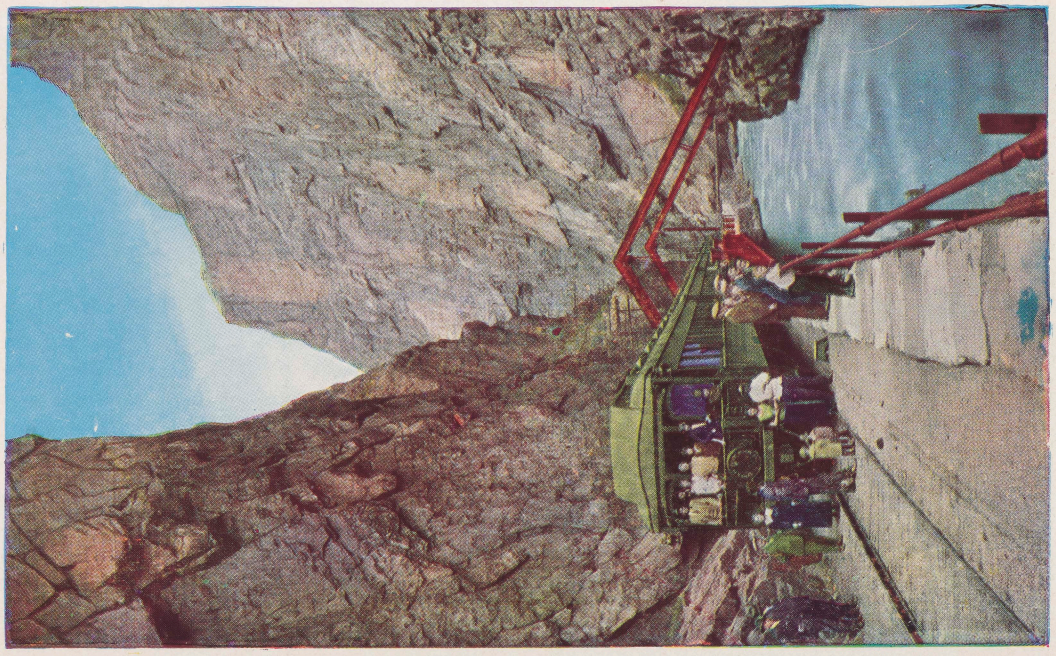
4425. At the Hanging Bridge, Royal Gorge, Colorado



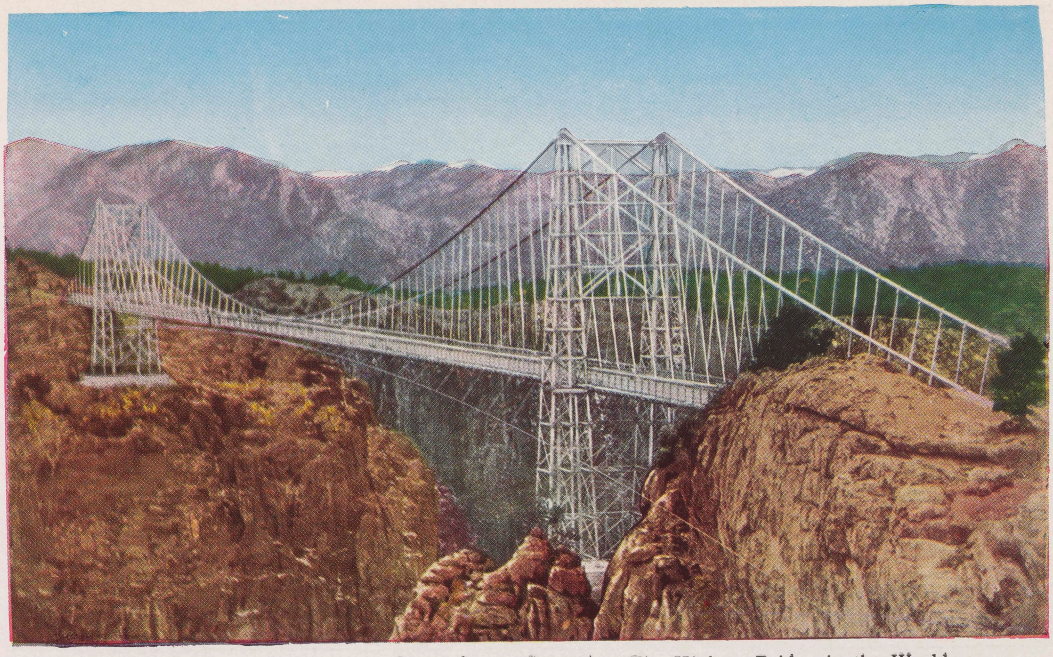
15753. Suspension Bridge over Royal Gorge, Colorado. The Highest Bridge in the World

"SEE AMERICA"

DENVER AND RIO GRANDE



4425. At the Hanging Bridge, Royal Gorge, Colorado



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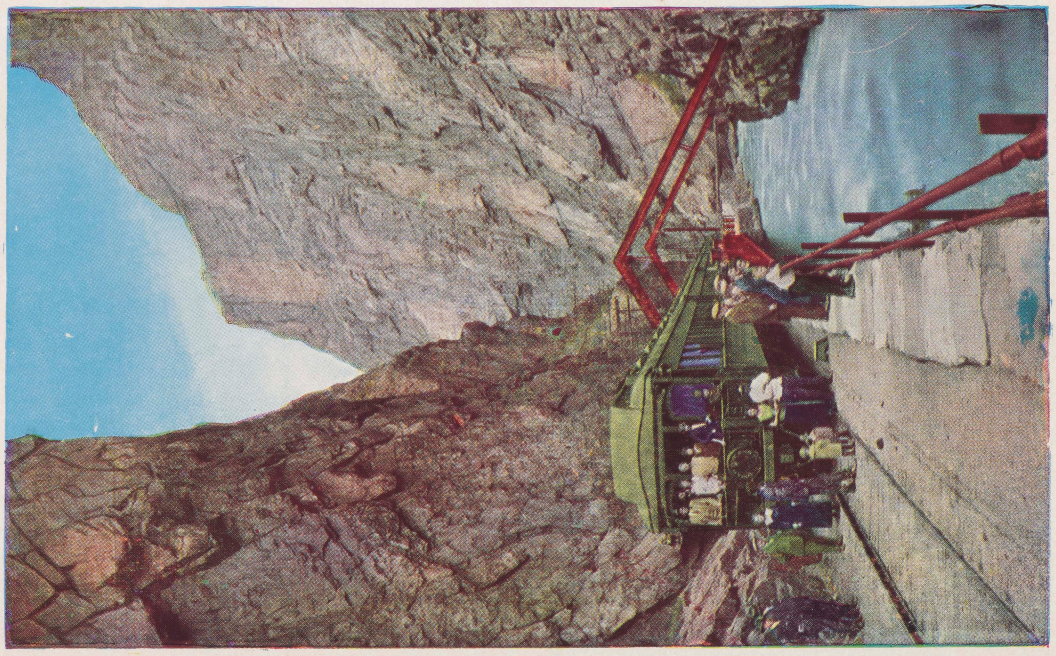
"SEE AMERICA"

DENVER AND RIO GRANDE



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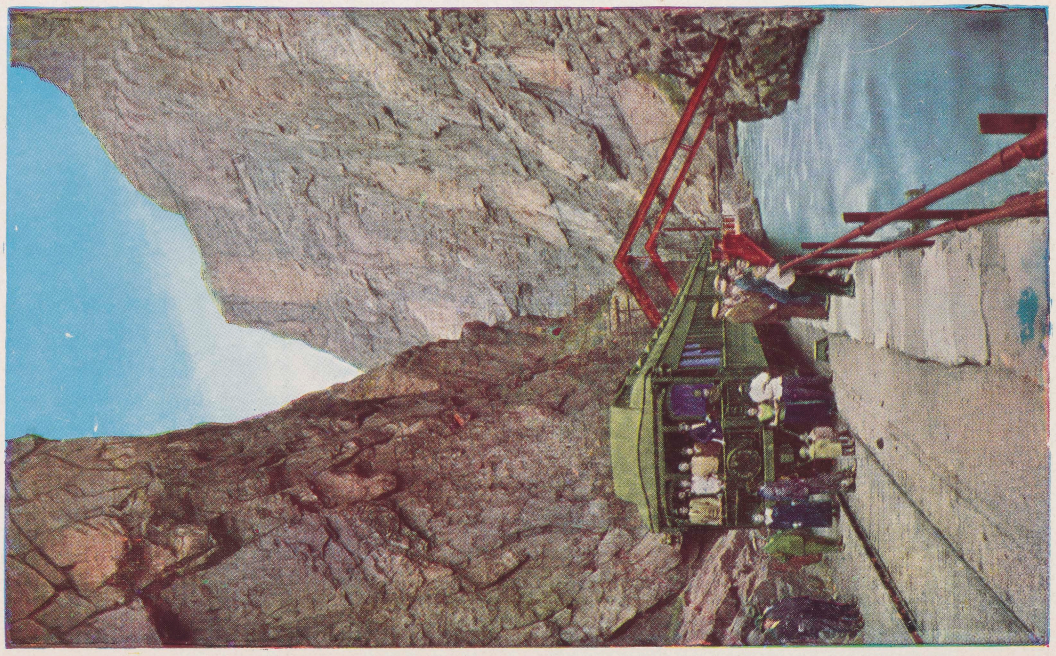
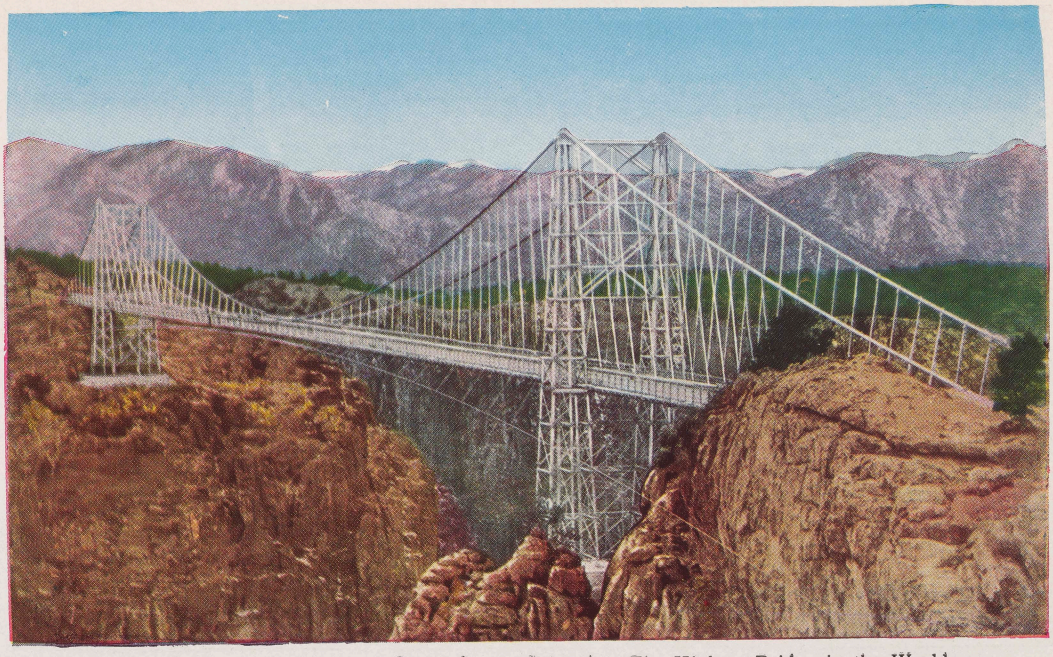
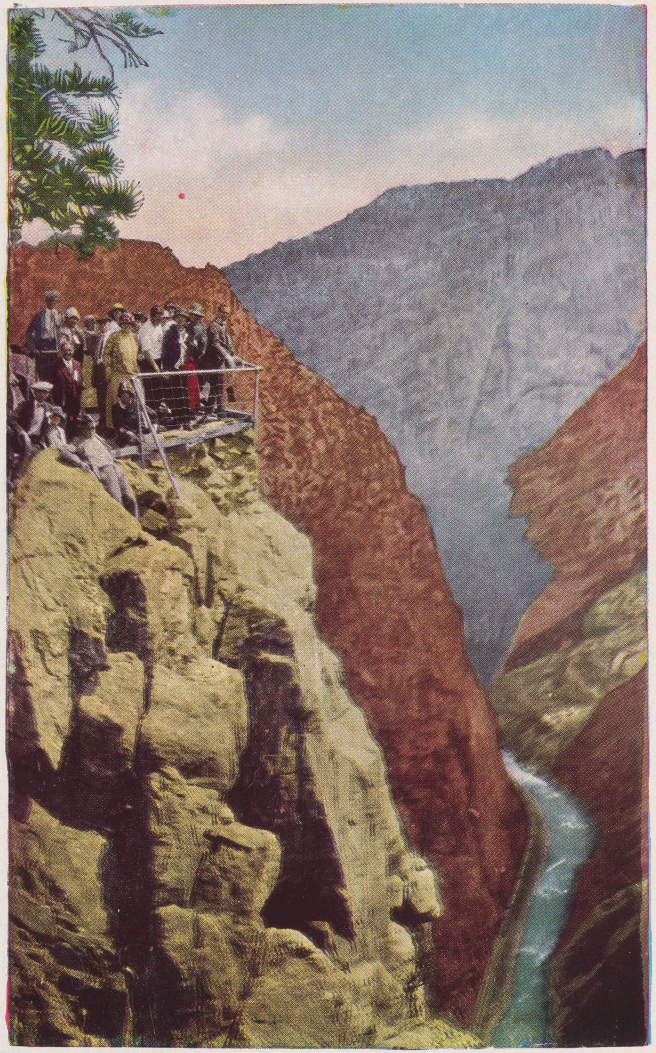
DENVER AND RIO GRANDE



4425. At the Hanging Bridge, Royal Gorge, Colorado



15753. Suspension Bridge over Royal Gorge, Colorado. The Highest Bridge in the World



4430. On Top of the Royal Gorge, Colorado

15787. Scenic Incline, Royal Gorge, Colorado
The Steepest Railway in the World

"See America"

Denver and Rio Grande

15754. Royal Gorge, Colorado. Spanned by the Highest Bridge in the World

15756. Skyline Drive, Canon City, Colorado. On the D. & R. G. W. R. R.

"See America"

DENVER AND RIO GRANDE

"SEE AMERICA"

DENVER AND RIO GRANDE

15756. Skyline Drive, Canon City, Colorado. On the D. & R. G. W. R. R.

15754. Royal Gorge, Colorado. Spanned by the Highest Bridge in the World

15754. Royal Gorge, Colorado. Spanned by the Highest Bridge in the World

15756. Skyline Drive, Canon City, Colorado. On the D. & R. G. W. R. R.

"See America"

DENVER AND RIO GRANDE

"SEE AMERICA"

DENVER AND RIO GRANDE

15756. Skyline Drive, Canon City, Colorado. On the D. & R. G. W. R. R.

15754. Royal Gorge, Colorado. Spanned by the Highest Bridge in the World

"SEE AMERICA"

DENVER AND RIO GRANDE

5096. Elephant Rock, near Palmer Lake, Colorado

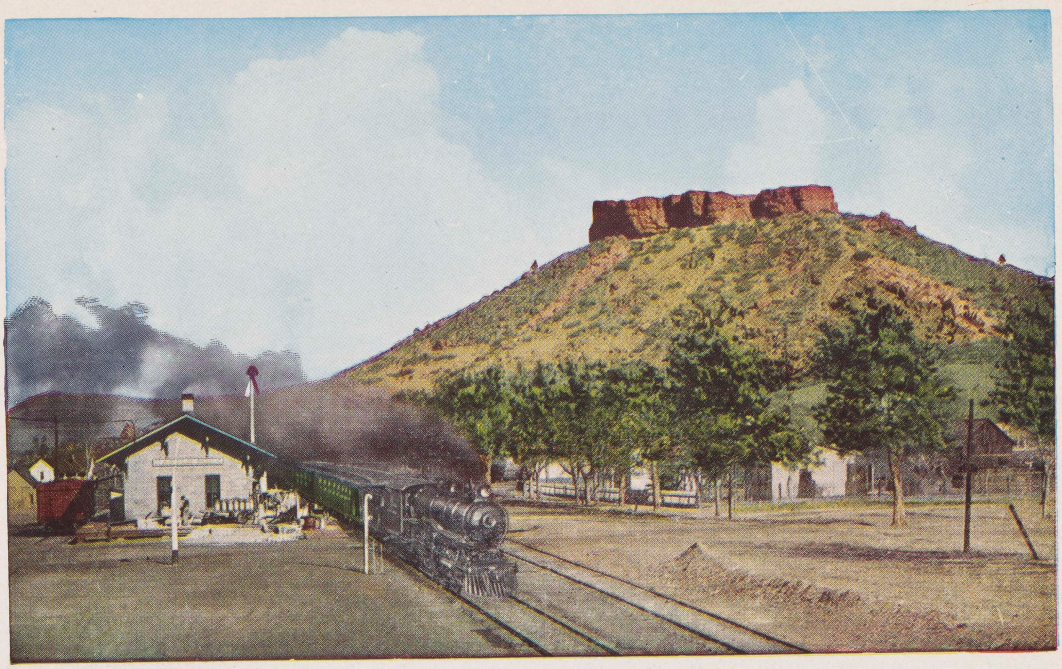
5229. Gateway, Garden of the Gods, Colorado. Pikes Peak in the Distance

"SEE AMERICA"

DENVER AND RIO GRANDE

MAIN LINE D. & R. G. W. R. R.

15796. Aeroplane View Business District, Denver, Colo.



5954. Castle Rock, Colorado

IN THE CLOUDS

OFFICIAL FOLDER

A THOUSAND MILES THROUGH THE ROCKIES

TWO MILES ABOVE THE SEA

Price 25c

MAILED FROM
THE
TOP OF THE WORLD
TENNESSEE PASS
COLO.
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10242 FT.

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WITHOUT
MESSAGE

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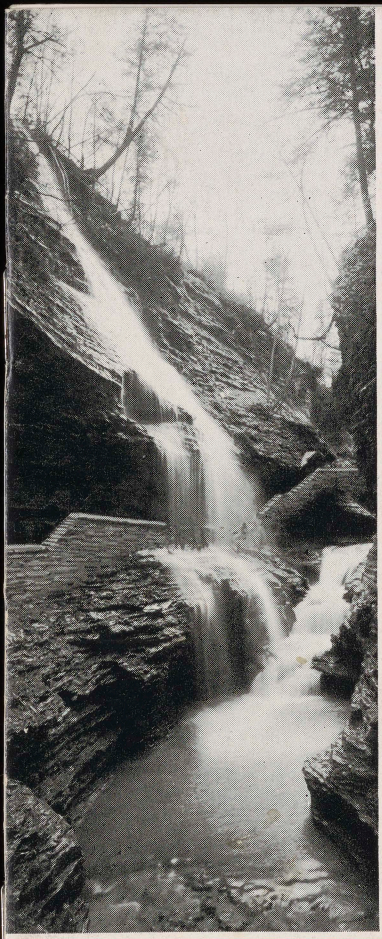
"THE ROYAL GORGE ROUTE"

On the Scenic Line of The World

Leaves from Maine



The New WATKINS GLEN N.Y.

Photo Gloss VIEWS

FOR _____

_____

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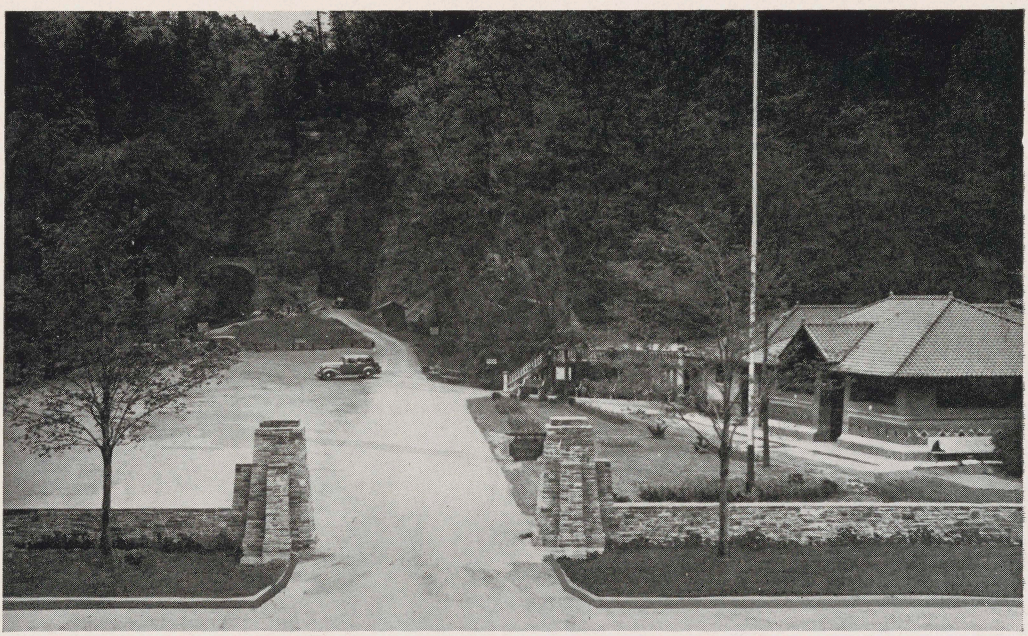
1½c
WITHOUT
MESSAGE

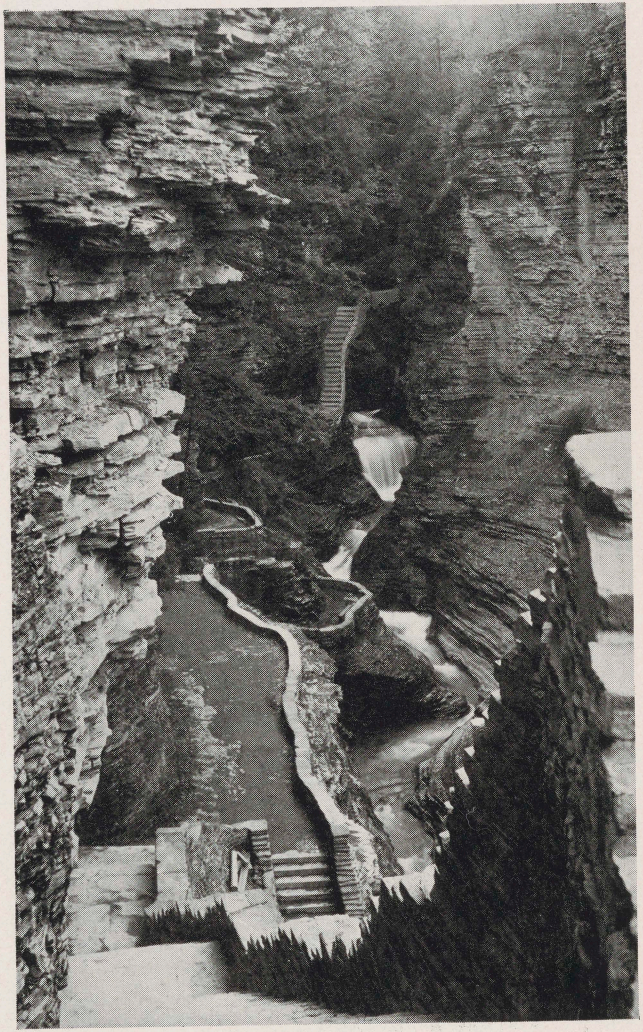


LOWER ENTRANCE

ENTRANCE TO TUNNEL

STILLWATER GORGE IN FLOOD

FOR POSTAGE



MINNEHAHA FALLS GORGE

STILLWATER GORGE

FOR POSTAGE

CAVERN CASCADE

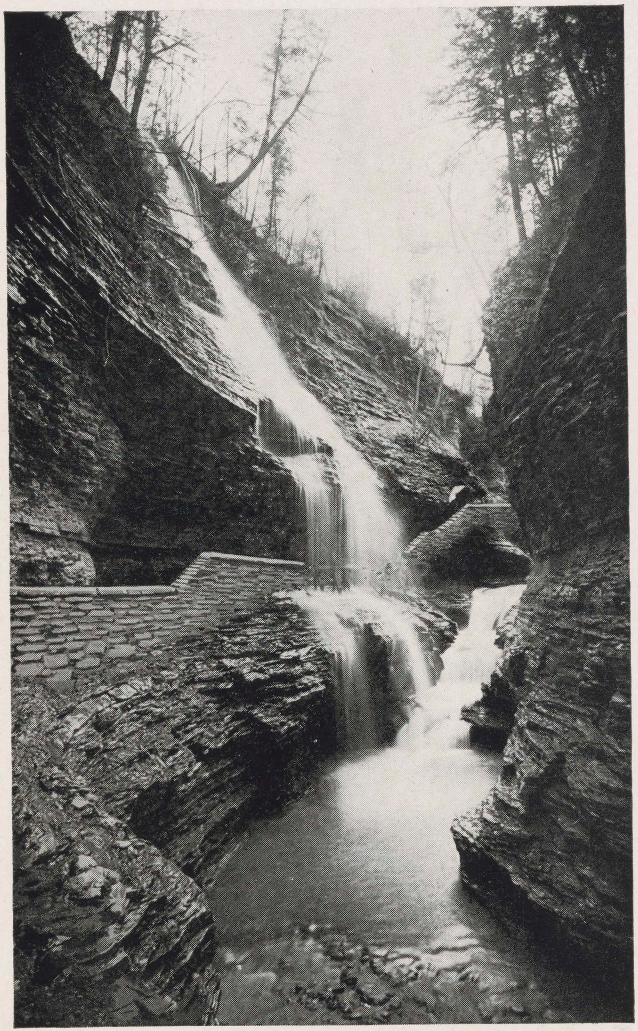
WHIRLPOOL GORGE

POSTAGE

FOR ____

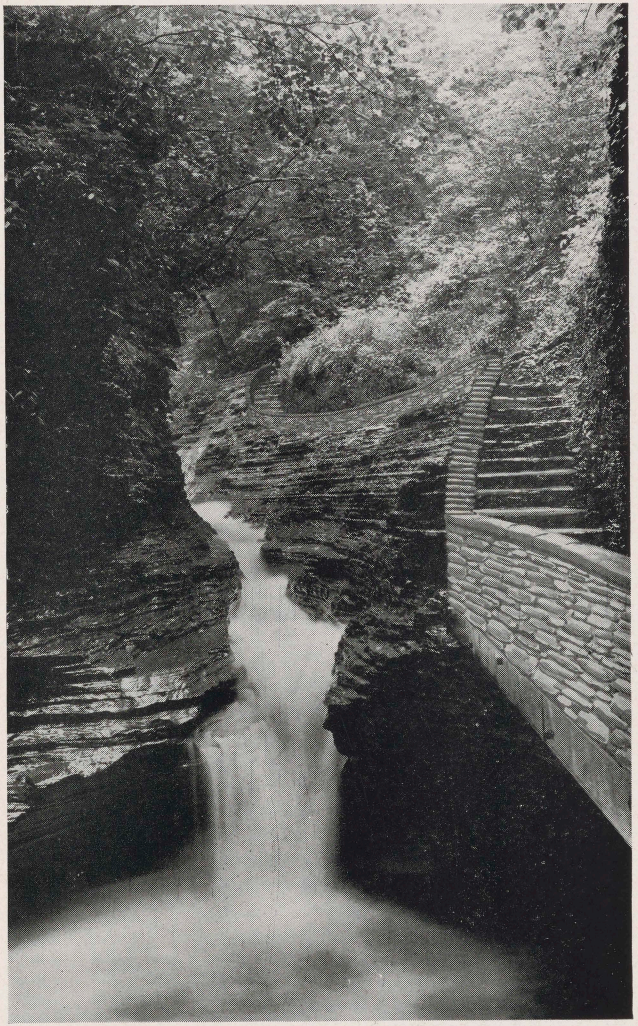
FOR _____ POSTAGE

CENTRAL CASCADE



RAINBOW FALLS

THE UPPER GLEN



SYLVAN RAPIDS

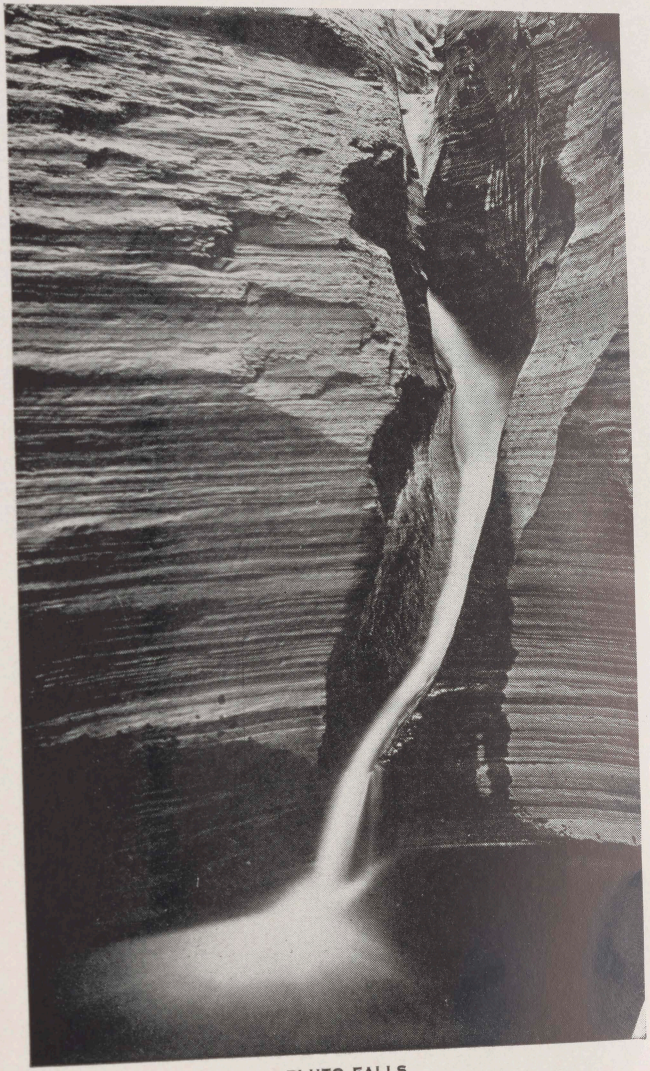
FOR POSTAGE

POSTAGE

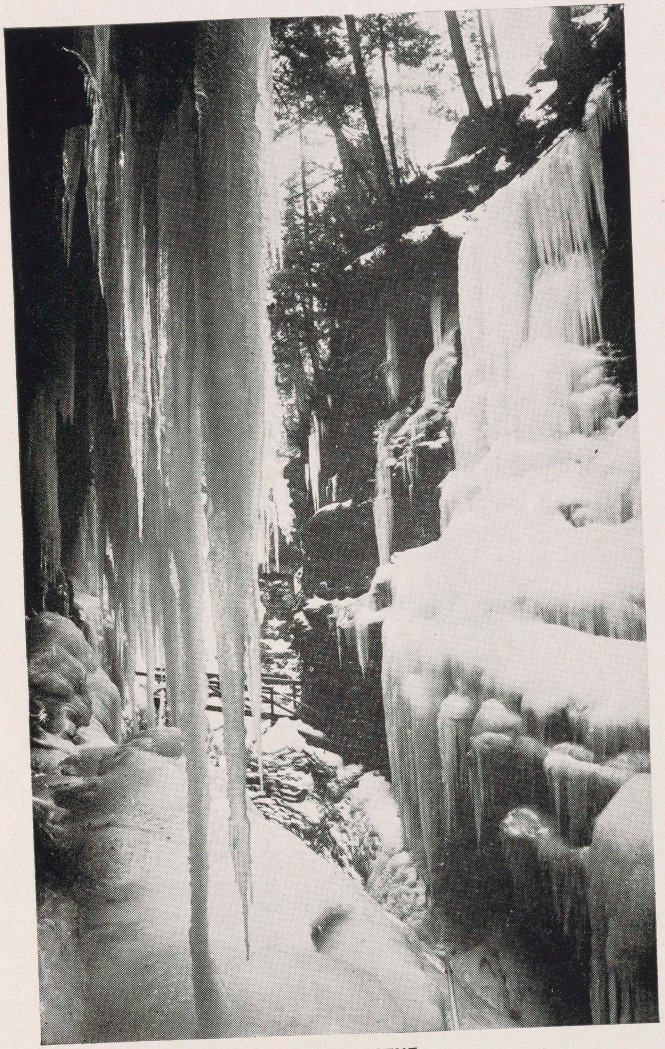
FOR

UPPER CAVERN GORGE

MINNEHAHA FALLS



PLUTO FALLS



WINTER SCENE

FOR _____ POSTAGE

FOR _____ POSTAGE

WATKINS GLEN

Near the head of Seneca Lake, the most beautiful of all the Finger Lakes of New York State, is located Watkins Glen, one of the most famous and beautiful of the Empire State's natural wonders. It is located in the village of Watkins Glen, named after its founder, Dr. Samuel Watkins, a native of England.

The Glen, first known as Mill Creek, was privately owned from 1794 to 1906. Several mills were operated by the power generated by the rush of the water through its narrow gorges. The trail was narrow and its bridges, stairs and railings were often destroyed in times of flood. Operated with a variation of financial successes, it gradually became more widely known and consequently increased in fame until in 1906 it was purchased by New York State as a State Park Reservation. It is now well known the world over. Its unique scenery sets it apart from any other natural formation.

Receiving its water from several springs, the stream, through centuries, has fashioned these deep winding canyons, cascades, galleries and grottoes out of the rocky strata leaving cliffs varying in height from one hundred to three hundred feet.

FROM _____

_____

_____

SEPARATION SHEET

THE FOLLOWING ITEM WAS REMOVED FROM THIS COLLECTION:
6 Photos of Temperature Stations at Wanakena, N.Y. & Ranger School. 1939

DISPOSITION: To photo archives 3/1/90

BOARD OF THE
BLACK RIVER REGULATING DISTRICT
WATERTOWN, NEW YORK

J. VICTOR BARON
PRESIDENT
HARRY S. LEWIS
GORDON H. P. GOULD

EDWIN S. CULLINGS
SECRETARY

October 23, 1939.

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

Dear Dr. Church,

It was a pleasure to show you some of our work last week and visit the meteorological stations at Wanakena with you and Mr. Farnsworth. Enclosed herewith are pictures of the stations visited, except the station on the hillside at Cathedral Rock, which I was unable to photograph. To photo archives

Sincerely yours,

E. S. Cullings

Secretary.

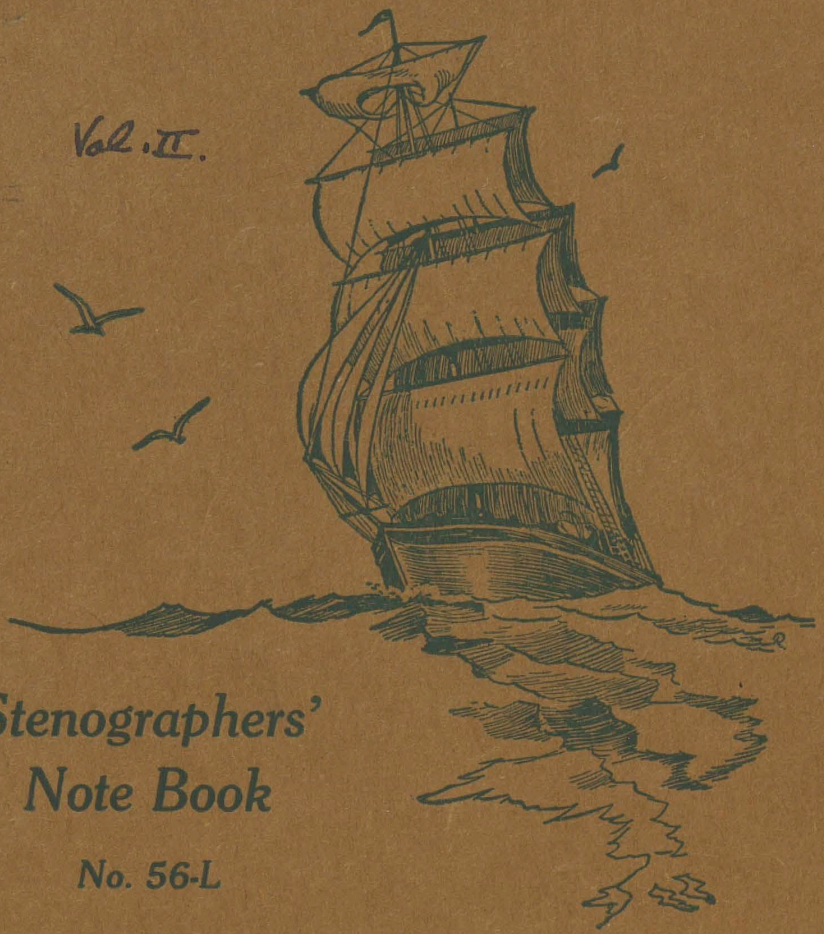
ESC:V

Enc.

Vol. 2

West-Trade

Vol. II.



Stenographers' Note Book

No. 56-L

Li-Rite

This is a Li-Rite Product manufactured by Everett Pulp & Paper Co.

Last Station –

In second growth hardwood but exposed on south side by new clearing for athletic field.*

Min. temp. in air . . . 12°F.

In Soil – 1 in deep 38°F
6 in " 41°F
12 in " 46°F
24 in " 48°F.

Temperature in soil at 3 feet (?) depth is much the same as average (summer?) temperature of the air or approximately 45°F.

Thus if the snow cover provides sufficient insulation against continued entry of frost, the earth temperature under the snow will slowly remove the frost providing the snow cover lasts thru the winter. In case the snow should disappear during the winter and frost thereby reenter the ground, the time might be too brief for a renewed snow cover to permit the soil temperature beneath the frost to remove it again.

Therefore the key to unfrozen soil is continuing snow cover rather than snowfall

* For photos of this and other stations see attached pictures and letter from the Callings.

before frost enters the soil. This is substantiated by the observation by Webster Bean that no or very little ~~spring~~ frost is found beneath the snow in the aspen copse in Spain at the time of the spring snow survey.

Query: Is this true earlier in the winter? Is the snow cover there deeper and more continuous than elsewhere?

Frost should be more prevalent in the lower portions of watersheds, where the snow cover may be much shallower and subject wind-drifting or winter melting. It is here that the heaving grounds are more prevalent — where Hayt obtained much evidence of the prevalence of frost in the ground. Dr. Brooks has already noted that floods are more prevalent in the lowlands.

Snow of itself can not produce warmth or wholly prevent the entrance of cold, as shown by the inability of heavy felt and sawdust packing at Mount Rose Observatory to protect the dry-batteries there from freezing. These soon burst open like boiled potatoes.

Relative Effect of Various Types of Forestation on Frost Prevention.

Cullings "has little data on frost. The Merrimac Committee is too precipitate."

Professor Farnsworth believes that fallen leaves protect against evaporation and drying-out of the soil rather than against the entry of frost. However, Director Peters and I have been successful in keeping apples and even susceptible gladiolus bulbs from freezing by a covering of leaves over soil.

Plainly hardwood leaves form a deeper litter in any one season than the conifers. On the other hand, the hardwood leaves rot more readily and create a moist humus that conducts temperature readily. With a succession of years, the pine and fir needles become a thick, dry mat where the trees are sufficiently dense to provide material.

The stations at Cranberry Lake represent only average forest cover. Some extreme conditions would be more valuable for convincing comparison.

Some such stands are available — particularly of Virginia Pine(?) on the highway toward Watertown. A similar conifer stand is also available at Glen Lyon, Pennsylvania. Deciduous stands can probably be readily found where the dry leaf-litter is similarly deep. Contiguous stands of hardwood and conifers, each extreme, might be hard to find.

The mixed hardwood and softwood or conifers seem native to the Northeast. The latter, tho badly cut out, seems to be returning persistently. However, the hardwood will always persist despite the shading effect of the taller conifers.

Interception by Foliage.

Four precipitation stations in the open and four in forest.

The catch in the forest for 11 years is 19% less than in the open.

1/10 in. rainfall absorbed by leaves.

Dry snow readily filters thru the branches of the conifers because of wind movement and is almost wholly unobstructed by the bare branches of the deciduous or hardwood ~~forest cover~~ forest growth. Wet snow clings especially to the conifers and somewhat to the hardwoods until evaporated. In the West where sun quickly follows storm, the frozen snow or "frost" accumulation is melted and drops to the ground.

Horton estimates a much heavier loss from interception of both snow and rain. See Weather Review Sep., 1919 (Vol. 47.) pp. 603-623. ~~quoted also cardin.~~

Runoff - 1½ in. rainfall on dry soil creates runoff. Autumn rains also show in runoff. This corresponds with Horton's view, but is at variance with the

failure of 6 in. rainfall in the Merrimac to ~~create~~ affect the streamflow. In the latter case there had been a prolonged period of drought. Possibly Cullings' and Horton's observations are based on normal soil moisture. The soil as observed during our trip seemed to be very moist as compared with Western soils. This is to be expected where precipitation occurs in uniform measure thruout all the months of the year. Even during the winter when the precipitation falls dry, midwinter melting may keep the soil well primed.

Transpiration can be measured indirectly by the relative increase in autumn or night runoff by the seasonal or diurnal rest from growth of the plant or crops and use of water.

Floods.

A flood from snow only, i.e. without assisting rain, occurred once in Black River in June because of excessive rise in temperature to 70°F. Such floods, however, are rare.

The failure of floods to occur in the

Mohawk Basin may be due to the fact that it is a controlled stream. However, northern New York and New England is glaciated with considerable loose soil capable of holding and detaining water.

Streamflow Data - Cullings is accumulating much streamflow data from which the weight of various runoff factors can be determined, but men must be trained to correct the records and analyze them. CCC or Emergency Aid employees usually lack the scientific preparation. Director Behre of the Northeast Forest Experiment Station at New Haven, Connecticut is sharing in the work and seeing an opportunity to prepare the material for publication.

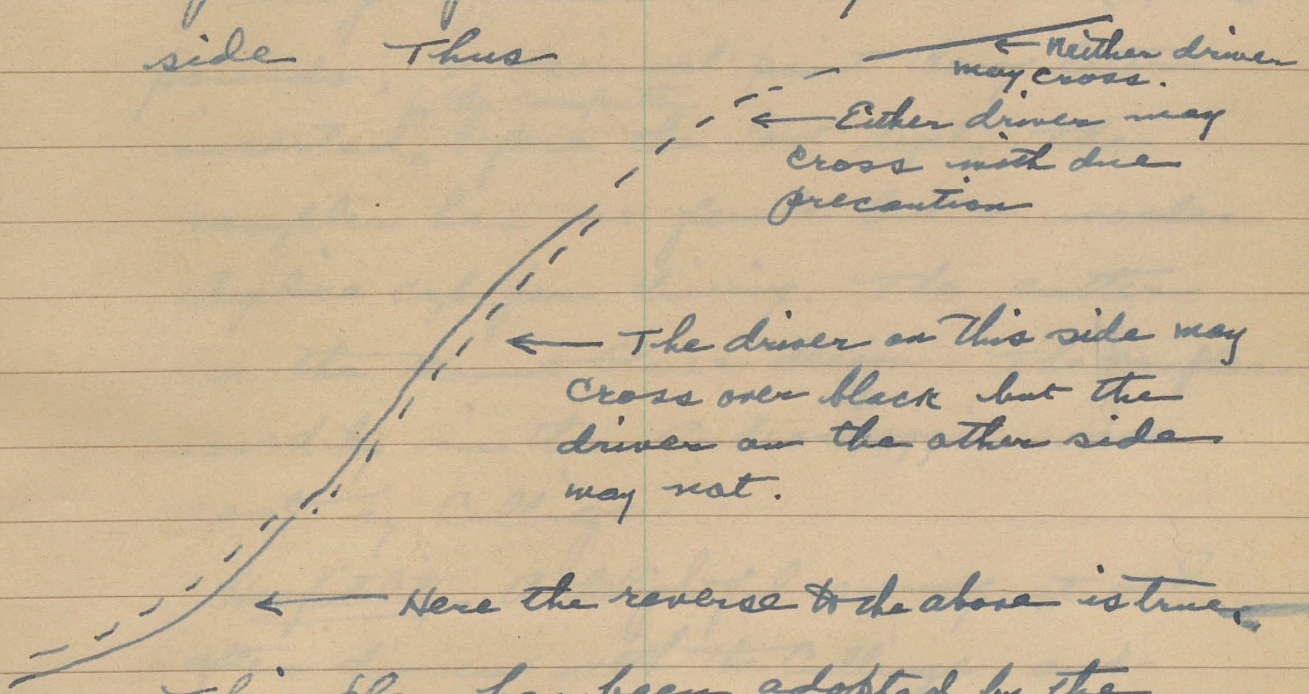
Descriptive material on "Northern Adirondack Rivers and the St. Lawrence River" is provided by Cullings in Bulletin No 33, June 1939, of the Division of State Planning of New York State as a portion of "A Preliminary Survey of Water Resources" there.

Power. The development of the New York lakes for power purposes was indicated by an abandoned iron mine along the roadside.

The following letter with accompanying photographs

Traffic Guide-Lines.

In New York State the seam between the two concrete courses of the roadbed represent a center or guiding line for traffic. The continuous black line may not be crossed unless a broken line appears on the driver's side of the road. A broken line may be crossed at discression but with the driver responsible. The lack of any black line gives full but reasonable privilege. Thus ~~the crossing~~ permission to cross the black line depends upon the visibility on the driver's side Thus



This plan has been adopted by the National Highways Association or equivalent group.

Chairmanship -

Mr. Cullings had relinquished his Chairmanship of the New York Cooperative Snow Surveys to Arthur Harrington, U.S. Geological Survey, Albany because of the wide extension of the snow surveys and the central position of Harrington in directing stream measurements.

Mr Cullings is now Consultant on Water Resources for New York State and is one of the best researchers on runoff.

Snow Sampler -

He developed his model of the snow sampler in order to obtain "a more perfect core" and reduce the cost. The diameter is adapted to weigh ~~pounds as~~ water inches (2:1) as pounds, a decimal point being later inserted by the computer before the last digit. The sampler has no ferule but a wooden plug like cap for driving. The cutter is the Mount Rose design. The sampler used by in the Androscoggin was sent by Cullings.

Hospitality. A delightful evening at and after dinner with the Cullings and promise of visit to Tahoe to share the Tree House.

October 19 - Southern New York State.

Into the south toward the five "Finger" Lakes, " of glacial origin. Forests cover ½ the area. Soil deep.

Cayuga Lake - Rolling hills. Lake long but shores lined with farms and parks. Almost as open and lacking in privacy as Washoe Lake.

Ithaca. Cornell University on hilltop. A deep glen severs the campus - Steep roads. Throngs of children. They look as young as the Nevada students.

Watkins Glen - at foot of Seneca Lake. A "Grand Canyon Jr" or Zion Park - Walls, vines, rock-hewn stairways and galleries, mühle. Shale formation. Vapor coolness, green pools, falls, forest clinging to the ledges, the narrow sky overhead. A gradual ascent with the stream for 1½ miles to the hill slopes beyond. Colors brighter - Rain of leaves falling into the glen. Could readily identify the setting of a large "chromo" of "Watkins Glen" which formed the centerpiece on the walls of my boyhood home and aroused my first love of grandeur in nature.

Now at 70, I chance to see the original
Into the Susquehanna Again.

To the south rose a mountain
divide between Lake Ontario and
the streams flowing southward, extending
northeast toward the Catskills and the
Mohawk and marking the southern
limit of the icesheet. The forest now
covers 3/4 of the area.

Over the divide and up the Chemung,
the northwest branch of the Susquehanna.
Broad tilled valley, hills like the Catskills.
Some bold like Delaware Water Gap - Mountains
thickly forested. Mostly hardwoods.
"Same topography and forestation at
Elmira, Binghampton and Oneonta
on the main upper Susquehanna",
said John Church, who had often traveled
this region on the Lackawanna Railway.
Fairly deep soil in valley bottoms, but
soil thin on the mountain slopes as
in Pennsylvania. The Lackawanna
was badly washed out for miles in
1936.

Churches, farm houses and barns are unpainted - This condition extends into western New York and eastern Ohio.

Interlocking with the channel and flowing north into Lake Ontario near Rochester is the Erie River, a source of power and industry for Buffalo in the early years of 1800 - It belongs to the slate formation of Watkins Glen. This was entered near the Falls of the Genessee near Portage, after an absence of ~~48 years~~ nearly a half century.

11th Barton Jurgensen
12th 1.50
2.10
3.60
9.15
12.62
1.68
27.05

Oct. 9	Y.M.C.A. Albany	1.15
" 13	Manchester Lunch	.45
14	Stanford Lunch	.35
15	Lewiston Breakfast	.75
	" Supper	1.00
16	" Breakfast	.75
16	Pinkum Notch Lunch	.50
	Montpelier supper	.50
	Montpelier Cabin	1.00
17	Bristol Breakfast	.40
17	Tupper Lake Lunch	.50
18	Watertown Breakfast	.35
18	" " Room	1.00
19	Adams N.Y	.40
19	Watkins Glen Lunch	.35
		$ 9.15
	1/2 Oil and Gas	12.62
	Fenders (my instance)	~~5.20~~
	Telegrams	1.68
	$ 35.15	~~$ 28.65~~
	(my instance) ~~Gas back to N.Y.~~	~~3.~~

Genessee - Basin, Western New York

October 20 - Basin much like Chemung Valley and Watkins Glen. Soil shallow - Some farming but early site of water power for mills - grist, textile, manufacturing of tools - for region as far as Buffalo 60+ miles distant.

Slate foundation - some decomposed. Biggest flood occurred in autumn - Heavy downpour. Forests second growth. Mostly deciduous. River flows into Ontario near Rochester.

Here the Genessee Falls cutting back thru slate. Three falls, high canyon walls. Bridal veils. Cascades over smoothed terrace-shelves. Miniature Yellowstone Falls.

Strata are not high up the walls, showing deep surface-flow. Talus slopes below show slow disintegration of walls but trees are climbing up the slopes or clinging to the ledges.

Private grant has made this a public park. It was once the home of the Senecas. Winding drives, paths, stairways, rustic balustrades, and outlooks afford easy happy access. Oak trees are dominant, but stands of every variety of conifers have been planted. Autumn here in the southland is at its best. The reddish brown of the oak when translucent in the sun is regal. How long will it be before the falls cut thru? The Northeast meets its paucity of playlands by specializing in parks. This is spiritually desirable and economically justified by the present surplus in agriculture.

To Coshocton, Muskingum Basin, Ohio

Up at 4 a.m. and down to the lowlands at Buffalo and signs of prosperous fields.

Lake Erie looked tiny and calm. Yet next day's news recorded the swamping of a boat in 15-foot waves.

Looked down into the inlet at Cleveland overtopped by derricks and viaducts but being straightened to create a harbor. An inevitable improvement — but the difficulties make it an engineering achievement. Tiny creeks can evidently be made wedges to the entry of commerce. Unlike Cleveland and Chicago, San Francisco had its harbor waiting.

Central Ohio must have been paradise to the early colonists gradually lured westward to Vermont, New York and then on, to northern Ohio — a true Western Reserve. ~~and crops better. Few pause.~~

Forests 1/10. Here soil is deep and level. But its floods?

Here are better crops but few passes.

From Columbus to Coshocton the trains speeds and jerks as in England. The hills are soon entered again. It begins to look like Pennsylvania. Coshocton. Sefo John and his auto at Buffalo. Fortunate here to establish immediate connection with Donald from Athens, Ohio, for the experimental watershed of the Soil Conservation Service was 10 miles distant near Jericho(?), and the phone was silent. It was week-end and tomorrow was Sunday. So far the circuit trip had been inexpensive and had carried me to every detail spot desired. Train or bus would have been expensive and long and fragmentary.

October 22. Donal, Pearl and Russell arrived from Athens 80 miles distant. The field was near Fresno and the office

had been moved from Coshocton to the site. Practically no one was at home. However, the general plan and method were clear.

a tower centrally located provided a panoramic view interpreted by a model relief map. The area was forest, pasture, and tilled land.

Many plots for determining erosion on various soils with various soil covers. The Ferguson Recording Precipitation Gage was frequently used to determine rainfall intensity. Some lysimeters.

The land was mostly rolling and often steep like the Ann Arbor hills.

The watershed on the north is a supercollector and conveyor of water, judging from the gaging dams and the gaging cables and cat walks. Possibly nine dams and water-recorders in 2 miles. Here the following sign draws attention to the project:

Ohio State Agricultural Experiment Station

Muskingum Water Conservancy District

North Appalachian Experimental Watershed

To study how farming practices effect soil and water conservation and floods.

U.S. Department of Agriculture

Soil Conservation Service

State Agencies Cooperating.

The houses are small and modern and artificially grouped on rolling knolls. Look like a new suburban addition. The old original farm houses are scattered over the project and the farms seem intact.

The Weather Bureau station is experimental and fairly complete. Various types of precipitation gages with wind screens. Also of evaporation pans — one with tiny spikes to atomize the wind, another in a broad pit. The precipitation gage is guarded against wind by a fence.

Write for a plan and descriptive inventory, particularly of the weather bureau instruments.

Is the Muskingum the Home of Floods?

Hocking Valley, Southeastern Ohio

Athens, October 22-26.

Into the Hocking Valley thru ever-rougher hills to Athens, seat of first college west of the Allegheny Mountains. This is the land of oil, gas, and coal.

Soil very thin, on slate hills. "Four days rain will cover the low-lands with water. Wide feeder lands upstream. The Ohio River is only 25 miles below. Forested as far as eye can see. Now a tapestry of autumn colors from salmon even to purples. The Faculty of Ohio University is seeking the heights for its homes.

Country progressively more poverty-stricken southeastward into West Virginia, Salt near Pomeroy.

Floodstakes measuring up to 4 ft. along the roads. Some tree planting on erosion slopes. Soil generally shallow. Second growth hardwoods cover ½ hill-area. Clay forms surface of byroads. Pottery works at Haydenville (?) Is even the soil impervious to water? At Cheney (Chauncey), "John Coats" ("John Coaty")

i. Red Leaves [redacted], are attached to
be back pack like life boats for emergency
use in sudden floods.

One National Forest sign was seen.
A forest officer is stationed at Athens.

"October 26 – Diary. Rain Effect: Pouring rains last night
with thunder. The leaves are being washed
down. At college saw "Our Town" by Thornton
Wilder. The chair music and upstairs window
scenes very impressive. A play of moods.
I never like the New Hampshire hilltop burying
ground where the breezes blow fresh and
the sky is clear. 'Love of life makes life,
and life makes love of life'. No curtain call.
Why do they have them?"

The rains of yesterday and last night
reached a total for the 24 hour Period at 8 o'clock this morning of
1.65 in. This forenoon of Oct. 26, it is still
pouring – probably half as much more.
"This is typical. Dry, then it rains".
Last years rains of 2 in., then of 4 in.
in single days.

At noon the river had risen perceptibly
or rather water was flowing over the

entire width of the dam where only one side was wet yesterday.

Sand for precipitation and streamflow records. The relationships of rain and runoff seem simple here.

Northwestward to Michigan

Farm land predominates. Towns apparently small between Columbus and Toledo. Passed thru Marion, home of President Harding.

No state parks, certainly no state forests here. The cynic might say that parks occur in inverse ratio to the fertility of the soil. Spirit and landscape are coordinate factors.

Art Galleries and Libraries

at Detroit

"The Detroit Institute of Arts
Dedicated by the People of Detroit
to the Knowledge and Enjoyment of Art."

Indian window panels

TITIAN ALBERT DÜRER etc.

Why not ~~[illegible]~~ at Reno

"Dedicated to Beauty and Life"?

Not often today until 1 p.m., my train time.

at Detroit Public Library opposite was the inscription "Knowledge and Power". On the frieze "Aristophanes, Aeschylus, Archimedes, Socrates, Plato, Cicero-Caesar, Aristotle, Epictetus, Justinian".

In the Library, was the inviting sign at one door, "The Reader's Advisory Assistant". This was my ideal for Charlie Chatfield, our Oxford Spirit, at our own University Library.

at Ann Arbor,
At the University of Michigan Librarian Bishop showed me a case double-tiered with Elzevir Classics purchased at $1.50 rather several $ per copy as before the War. The spirit of conserving the eternals is still strong here.

Snow Cruiser
~~Another Protest~~

Dr. Hobbs had just returned from Fort Wayne, Indiana to inspect the Armour Institute Snow Cruiser going to Boston to join the Byrd Expedition to Antarctica. Admiral Byrd had previously used caterpillar tractors with some success, but these had

failed to cross crevasses. The snow mobile was planned to meet this defect. However, the use of pliant rubber tires under conditions of extremely low temperature seems problematical.

Is there any experience in Arctic America or Siberia to guide?

The more serious difficulty would be the tendency of wheels to cut themselves into sand or snow especially when spinning. Will even 10 ft. wheels be sufficiently large either to ride on the snow or hold the car above the softer snow. The 27 tons weight of the cruiser should crowd the wheels somewhat deep into the snow before the density of the snow would be sufficiently great to hold them up. Old snow not yet become firn or icy will scarcely have a density greater than 60 per cent.

We shall await reports of experience.

Measuring Drifting Snow

Byrd's departure suggested the greatest of all snow problems — or the last, i. e.

the development of an instrument for measuring precipitation under high-wind conditions and a method of determining the growth of Polar snow cover. The experience in Greenland and Sweden is only preliminary. Only so, can basic data be procured for quantitative study of the Polar ice caps.

I suggested to Dr. Hobbs that I would like to spend a season in Antarctica. He gigged me slightly about my age and said No. But I insisted as slightly that in fact I was 40 years younger. Present accumulation of duties prevents now, but I shall clear my desk for the next opportunity.

This problem has been suggested to the present Byrd Expedition by some one See Sci. Mo. for October 1939 p. 382ff. and Papers and Discussions of The Assoc. for the Study of Snow and Ice Sept. 1939. Consultation on scientific plans for expeditions are now to the United States the old to Denmark.

No floods in Michigan - Wisconsin

Librarian Bishop supplemented my observations in the East by stating that floods in Michigan and Wisconsin are practically unknown. One exception told him by a resident was in southeastern Michigan on the Ohio border.

This immunity is probably due to deep glacial soil, the multitude of lakes that serve as storage or detention basins, and the subsoil pockets cut by the ice sheet. This area is really an extension of arctic America with its glacial pockets, except that it possesses ~~but with~~ deeper soil.

The distance of this area from the Gulf and relative freedom from incursions of warm moisture-laden air may be a contributing factor. An interesting problem.

The sources of the streams come almost imperceptibly from lowlands - The bog lands appear large and the streams small. The pocket lakes seem to be diminishing in area. The rivers grow slowly in size.

Nov. 1, Southern Michigan.
Trees, Fields, and Streams.

The scenes are Autumn and March. as portrayed by George Innis and Metcalf. Red-brown thickets, bright green fields, yellow leaves, and bare trees. Rivers seem small, marsh-land much. Snow flurries.

Nov. 2 - Illinois.

Wet snow at Chicago. Out of trees into black soil. Coal towns. Bloomington. Country looks backward or rather run-down.

Not much chance for game except water fowl to exist.

Cornstalks standing in fields. Outdoor fodder?

Hill country and oaks again. Do oaks fail on level?

So far towns of size on the Chicago-Alton, yet 6 trains daily each way. Chicago - St Louis traffic? Why Chicago and Alton originally? Latter only a scattered town, tho a big refinery to southeast. Feeder to Mississippi River?

Oak-trees fail again on flat land
nearer St Louis.

Mississippi River and St Louis

Mississippi River thru St Louis is
desolation itself. Houses on flood plain
dingy. But a driveway is being planned
along the river front. Great bridges
of 3 spans impressive.

Parks, colleges, hitch-hiking to school.
But smoke in city basin, mostly from
poorer private homes. Coal is poor and
cheap. $2.00 per ton at the nearby mines.
A great plaza being developed. Statuary:
The wedding of the Mississippi and Missouri.
Naked! Why not?

Nov. 3. Missouri River and Kansas City.

Along the Missouri River. Wing dams
as along the Rhine. Rolling uplands.
At Kansas City the hills and ravines
have been preserved as key landscape
with winding roads and paths subordinate.
A large bronze eagle is alighting by the
roadside. A Japanese motive and piece.
The War Memorial Tower is the

culmination of the solid rock hillside south of the heart of the city and above the railway station. Among the hills to the south, is the Art Gallery, a recent gift in a large part. It is classical outside but like the Gardner Fenway Museum inside except for the central court supported by black columns placed too close together. The black is very discordant when associated with the lighter walls.

Masterpieces are represented by full size copies - so real as to be convincing and startling.

November 4. The Dust Bowl.

The Dust Bowl is still cultivated but grey. Cattle feeding. Homes are distant dots in the landscape. Climbing upward.

"Sugar City": Sugar beets in piles - even corded up. Trees, hay, irrigation, a striking change.

Then a reservoir. Winding river in broad basin. The Arkansas: Cottonwoods, low hills, alfalfa, ditches.

Greybeard trees, grey sagebrush, grey soil, grey sheep, alfalfa almost grey. A Hagen landscape - except even greyer.

Corn, but only a few shocks. Silos.

Mountains appear suddenly out of the dust and murk.

Rocky Mountains

at Pueblo, leaves.

Along the mountain front at 6000 feet to Colorado Springs. Fine Arts Center with view upon Pike's Peak, like Nevada Art Gallery upon Mt Rose. A miniature of Rockefeller Center architecturally. Literature, drama, arts, teaching and exhibits. Latter mostly loans.

Broad boulevards. Zigzag road up Cheyenne Peak. A Will Rogers Memorial on a look-out point enroute. The cut in the face of the mountain is very raw. Will nature later cover the scar? Built by a brother of Boies Penrose - partly commercial.

Every day sunshine, but I have grown to love nature in every mood and enjoy it.

Erosion. The Soil Conservation Service seems to have closed it office and experimental plots at least temporarily. Every stream is a coulee - narrow but deep, like Grand Canyon. Washes. Flood of 1935?

The soil is deep. Why is the runoff so rapid and heavy? Sandstone strata in mountains, fairly close to surface.

The Upper Arkansas

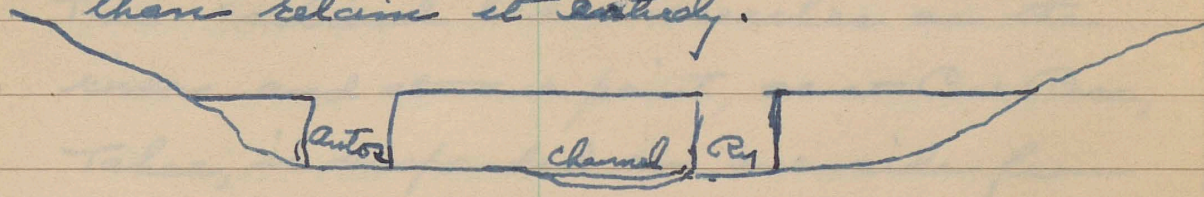
At Pueblo the Arkansas is being carried along and above the railroad tracks in a special bed against the hillside.

New artificial channel due to flood of many years ago. Its capacity is increased by its smooth sides.

At station candy counter: "Carters Pills?" A giggle: "Sorry but no pills". So no candy.

Outside of Pueblo the Arkansas is a broad gravel wash in a desert landscape. A bulkhead of concrete has been built

entirely across the river valley for the detention of excess floods. There are two open gates for the auto road and the railroad. As at Dayton Ohio, the dam is planned to pass the water slowly thru the gates rather than retain it entirely.



Erosion country. Are floods due to quick and therefore copious runoff?

Farther upstream are incipient Royal-George canyons. Above Royal Gurge the mountains are mostly rock.

At Canyon City, the Arkansas suggests the Truckee River above Verdi. High on mountain face is a vertical quarry belonging to the penitentiary.

Lunch served in seat for 30 cents. Identical meal in the dining car cost double the price. I made a mistake

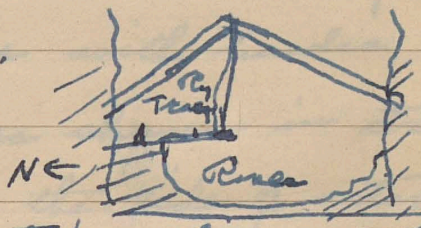
Slogans:

Denver and Rio Grande Western Railroad.
Thru the Rockies
Not around them

Royal Gorge
Moffat Tunnel
"Scenic Line of the World"

The Moffat Tunnel Route is westward from Denver and more direct.

Royal George an immense Watkins Glen or Marble Canyon seen from below. The railroad bed encroaches on the river and at one point, as at Cave Rock, Tahoe, is suspended on one side from roof-like girders.



However, the widest part the most part is one rock. Saw this first 1892 and never since until today. It has grown in grandeur. Far overhead where the light comes thru is a suspension bridge where the figures of men are almost insect in size. This addition in 1929 - only 10 years ago - portion of a scenic skyline drive. But the view into the gorge can scarcely compare with the view from below.

A power pipe line of wooden staves is suspended from the wall opposite,

Little soil erosion above Canyon City, practically none above Royal Gorge. But rock gullies and canyons abundant.

Rising 1000 feet each 30 miles. Yole to Tennessee Pass approximately 1300 feet in 24 miles. The mountain crests are white. Following the Arkansas River to the pass. Here river is a gravel wash. Flood here. Alluvial fan of gravel at base of crest. Then terrace parks with tundra. Gravel beneath tundra as shown in stream beds.

Brief climb by the side of autos then evergreens into short tunnel at top. Occasional snow here at 10240 feet. (Tennessee Pass). Night. "Economy Dinner 36¢."

Down West Slope of Rockies

10½ hours rest. Jockeying down the mountains — fast, slow under delicate touch of the engineer. Lustrous stars of the Zodiac. Finally level — jerking to and fro. On time. Salt Lake City in haze. Heavy frost.

The Great Basin

On Great Salt Lake. "Like trip to Key West. Blue like Mediterranean" - an enthusiastic world-traveller. Lake 75 miles long by 30 miles broad. 22% salt. 700 buffalo on island. Bear River Bay forming the wild fowl refuge appears to be cut off from the main lake by the railway cut-off. Is this true? or are there conduits?

Over White Pine Mountains to Wells. Our traveller is an ardent dweller of Devonshire. She loves nature but green trees most.

Challenger cars exclusively for women and children (the German Pullman Corps). A stewardess in gray and scarlet cap. Possibly the Scandinavian type - attractive, strong, the natural companion of the train crew. Like Astrid Fonder, our radio operator on the Disko to Greenland.

Snow line on Ruby Mountains 8,000 ft. Snow thin. Humboldt River almost sluggish. Fields brown but lush

good after the desert.

Reading Haswell's New Deal in Old Rome.

A mandlin bound for Honolulu at dinner table with a bottle of beer - finally cut by the woman he was trying to claim.

Abiding Impression

The Western sunsets are beautiful but the autumn colors of the East are unforgetable. Why had this passed over my youth unnoticed? Perhaps my sense of beauty has grown slowly.

This trip has been a college education in its new experiences and view points. Snow surveying now spans the United States as the basis factor in forecasting runoff.

Future Problems

Director Yates suggests a trip to Tennessee Valley to seek snow survey values there. At least contrasts should be sought between the action of streams fed entirely by rains and those fed at least in considerable part by snow.

Seek funds from U.S. Soil Conservation Service for travel expenses to conduct studies on flood forecasting.

Go to Antarctic to study measurement of snowfall and snow cover. Fortunately, ~~Wm Dewey~~ Herbert G. Dorsey Jr. is taking on the present Byrd Expedition the latest Mt Washington type of precipitation shield (Bulletin No. 23) to expose at as great a height as possible at the East Base, which he has been assigned, writes Dr. C.F. Brooks (Nov. 24, 1933) Perhaps 100 feet will be required to get above snow drift. The results of this experiment should be prepared for the next meeting of the Snow Commission. However, this should be only the introduction to a broader project of measuring both precipitation and snow cover. It should have been started the present Expedition. We shall be more alert for the next.

~~Iceland, Meteorology~~

Program Material

The following material was discussed and much has been promised for presentation at Snow Conference and publication:

Program for Snow Conference in the East

Horton, Frost and Runoff.

Salo, A forecast System for based on snow surveys at mean elevation.

Bean, Quantitative Forecasting of Runoff and Floods in the Androscoggin.

Cullings, Forestation and Runoff Rates in the Adirondacks.

Roberts, Flood Investigation Committee Dept of Agriculture
Relative value of timber types in frost prevention.

~~Note. Valuable also in the West.~~

Bean Jr and —, Compensation of Cullings and Mr. P. Sampler

This material will also be valuable for the Western Snow Survey Conference also.

J E Church, Meteorologist

15 copies.

-12-13

Hydrology

12 13

Hydrology

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[illegible]

— Harry Dukes
[illegible] water master.
[illegible]

— ep. Osgood
1022 Forest street.
Reno

Truckee-Carson Irrigation District
Fallon Nev.
C o W.L. Wallis

— Thomas R. King
29 East First St.
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Prof. W.O. Wagner
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