TELEPHONE, JEFFERSON 10,000

CABLE ADDRESS BUFSCI

BUFFALO MUSEUM OF SCIENCE
HUMBOLDT PARK
BUFFALO, NEW YORK

DIVISION OF
GEOLOGY AND PALEONTOLOGY

July 31/1930

Dear Cooper,

I found the copy of your paper; many thanks.

The map is enclosed, I have an undoubtedly of the outcrops of the Salamanca but they are scarce and those are all that I found while there. I did not keep a complete record of outcrops of formations other than the Salamanca. There are some additional localities we have Salamanca that is all thanks.

With best wishes for Mrs Cooper and yourself.

Sincerely yours
John J. Stanford

X outcrops of Salamanca congl.

+ other outcrops (incomplete)

DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

STATE OF NEW YORK
FRANK M. WILLIAMS
STATE ENGINEER AND SURVEYOR
(Cattaraugus)

NEW YORK
(CATTARAUGUS COUNTY)
RANDOLPH QUADRANGLE

RANDOLPH, N.Y.

Edition of 1923

Topography by H.H. Hodgeson and J.L. Lewis.
Surveyed in 1922 in cooperation with the State of New York.

Polyconic projection. North American datum.
5000 yard grid based upon U.S. zone system, B.

THROUGH ROUTES
SECONDARY ROUTES
SECTIONS IN POOR CONDITION

Scale 1/62500
1 0 1 2 3 5 Miles
5000 0 5000 10000 15000 20000 Feet
1 0 1 2 3 5 Kilometers

Contour interval 20 feet.
Datum is mean sea level.

APPROXIMATE MEAN DECLINATION, 1922
TRUE NORTH
MAGNETIC NORTH

NEW YORK—PENNSYLVANIA BOUNDARY LINE

THE TOPOGRAPHIC MAPS OF THE UNITED STATES

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Although some areas are surveyed and some maps are compiled and published on special scales for special purposes, the standard topographic surveys for the United States proper and the resulting maps have for many years been divided into three types, differentiated as follows:

1. Surveys of areas in which there are problems of great public importance—relating, for example, to mineral development, irrigation, or reclamation of swamp areas—are made with sufficient accuracy to be used in the publication of maps on a scale of $\frac{1}{31680}$ (1 inch = one-half mile), with a contour interval of 1, 5, or 10 feet.

2. Surveys of areas in which there are problems of average public importance, such as most of the basin of the Mississippi and its tributaries, are made with sufficient accuracy to be used in the publication of maps on a scale of $\frac{1}{62500}$ (1 inch = nearly 1 mile), with a contour interval of 10 to 25 feet.

3. Surveys of areas in which the problems are of minor public importance, such as much of the mountain or desert region of Arizona or New Mexico, are made with sufficient accuracy to be used in the publication of maps on a scale of $\frac{1}{125000}$ (1 inch = nearly 2 miles), with a contour interval of 25 to 100 feet.

A topographic survey of Alaska has been in progress since 1898, and nearly 37 per cent of its area has now been surveyed. About 10 per cent of the Territory has been covered by reconnaissance maps on a scale of $\frac{1}{625000}$, or about 10 miles to an inch. Most of the remaining area surveyed in Alaska has been mapped on a scale of $\frac{1}{250000}$, but about 1,000 square miles has been mapped on a scale of $\frac{1}{62500}$.

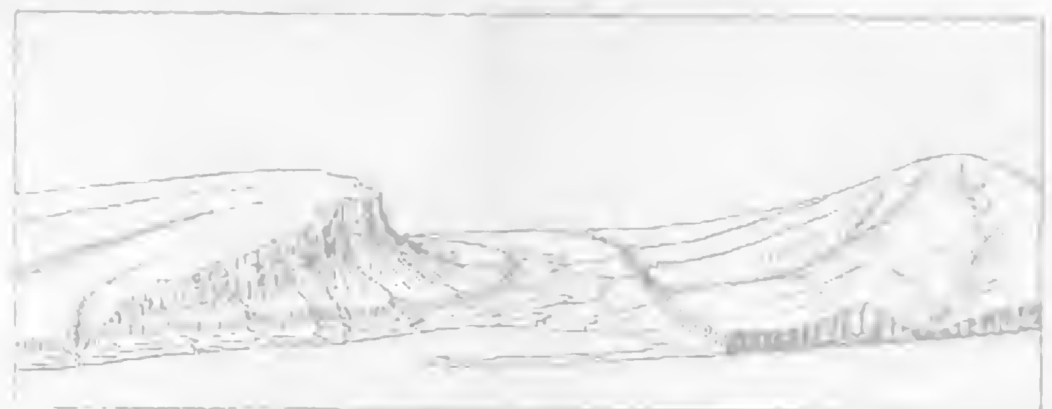
About half of the Hawaiian Islands has been surveyed, and the resulting maps are published on a scale of $\frac{1}{62500}$.

The features shown on these maps may be arranged in three groups—(1) water, including seas, lakes, rivers, canals, swamps, and other bodies of water; (2) relief, including mountains, hills, valleys, and other features of the land surface; (3) culture (works of man), such as towns, cities, roads, railroads, and boundaries. The conventional signs used to represent these features are shown and explained below. Variations appear on some earlier maps, and additional features are represented on some special maps.

All the water features are represented in blue, the smaller streams and canals by single blue lines and the larger streams, the lakes, and the sea by blue water lining or blue tint. Intermittent streams—those whose beds are dry for a large part of the year—are shown by lines of blue dots and dashes.

Relief is shown by contour lines in brown, which on some maps are supplemented by shading showing the effect of light thrown from the northwest across the area represented, for the purpose of giving the appearance of relief and thus aiding in the interpretation of the contour lines. A contour line represents an imaginary line on the ground (a contour) every part of which is at the same altitude above sea level. Such a line could be drawn at any altitude, but in practice only the contours at certain regular intervals of altitude are shown. The line of the seacoast itself is a contour, the datum or zero of altitude being mean sea level. The 20-foot contour would be the shore line if the sea should rise 20 feet. Contour lines show the shape of the hills, mountains, and valleys, as well as their altitude. Successive contour lines that are far apart on the map indicate a gentle slope, lines that are close together indicate a steep slope, and lines that run together indicate a cliff.

The manner in which contour lines express altitude, form, and grade is shown in the figure below.



The sketch represents a river valley that lies between two hills. In the foreground is the sea, with a bay that is partly inclosed by a hooked sand bar. On each side of the valley is a terrace into which small streams have cut narrow gullies. The hill on the right has a rounded summit and gently sloping spurs separated by ravines. The spurs are truncated at their lower ends by a sea cliff. The hill at the left terminates abruptly at the valley in a steep scarp, from which it slopes gradually away and forms an inclined table-land that is traversed by a few shallow gullies. On the map each of these features is represented, directly beneath its position in the sketch, by contour lines.

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Each quadrangle is designated by the name of a city, town, or prominent natural feature within it, and on the margins of the map are printed the names of adjoining quadrangles of which maps have been published. Over 3,000 quadrangles in the United States have been surveyed, and maps of them similar to the one on the other side of this sheet have been published.

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THE DIRECTOR,
United States Geological Survey,
Washington, D. C.

January, 19[illegible]

CONVENTIONAL SIGNS

DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

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FRANK M. WILLIAMS
STATE ENGINEER AND SURVEYOR

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(CATTARAUGUS COUNTY)
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Scale 1/62500
1 Mile = 5000 Feet = 1.5 Kilometers
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Polyconic projection. North American datum.
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THROUGH ROUTES
SECONDARY ROUTES
SECTIONS IN POOR CONDITION

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CONEWANGO
NAPOLI
LITTLE VALLEY
RANDOLPH
COLD SPRING
SALAMANCA
SOUTH VALLEY
ALLEGANY STATE PARK
ALLEGANY INDIAN RESERVATION
ELLICOTTVILLE

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A topographic survey of Alaska has been in progress since 1898, and nearly 37 per cent of its area has now been mapped. About 20 per cent of the Territory has been covered by reconnaissance maps on a scale of $\frac{1}{250000}$, or about 4 miles to an inch. Most of the remaining area surveyed in Alaska has been mapped on a scale of $\frac{1}{180000}$, but about 4,000 square miles has been mapped on a scale of $\frac{1}{62500}$.

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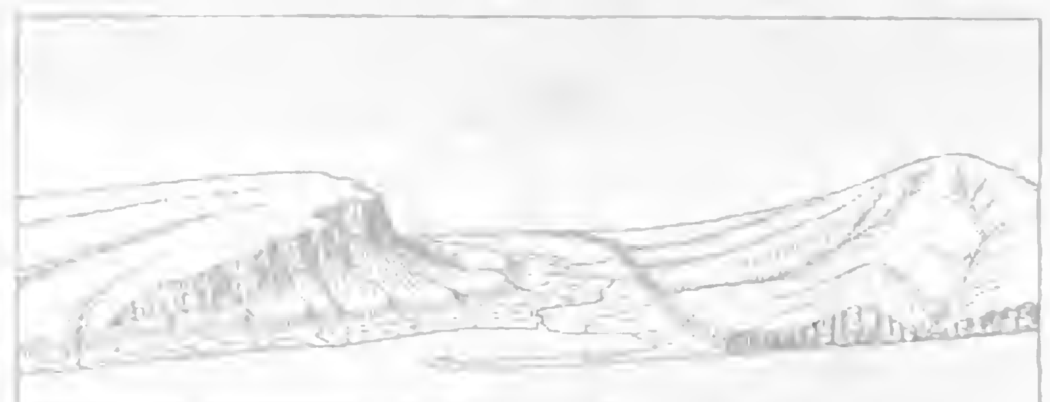

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THE DIRECTOR,
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Washington, D. C.

January, 1924.

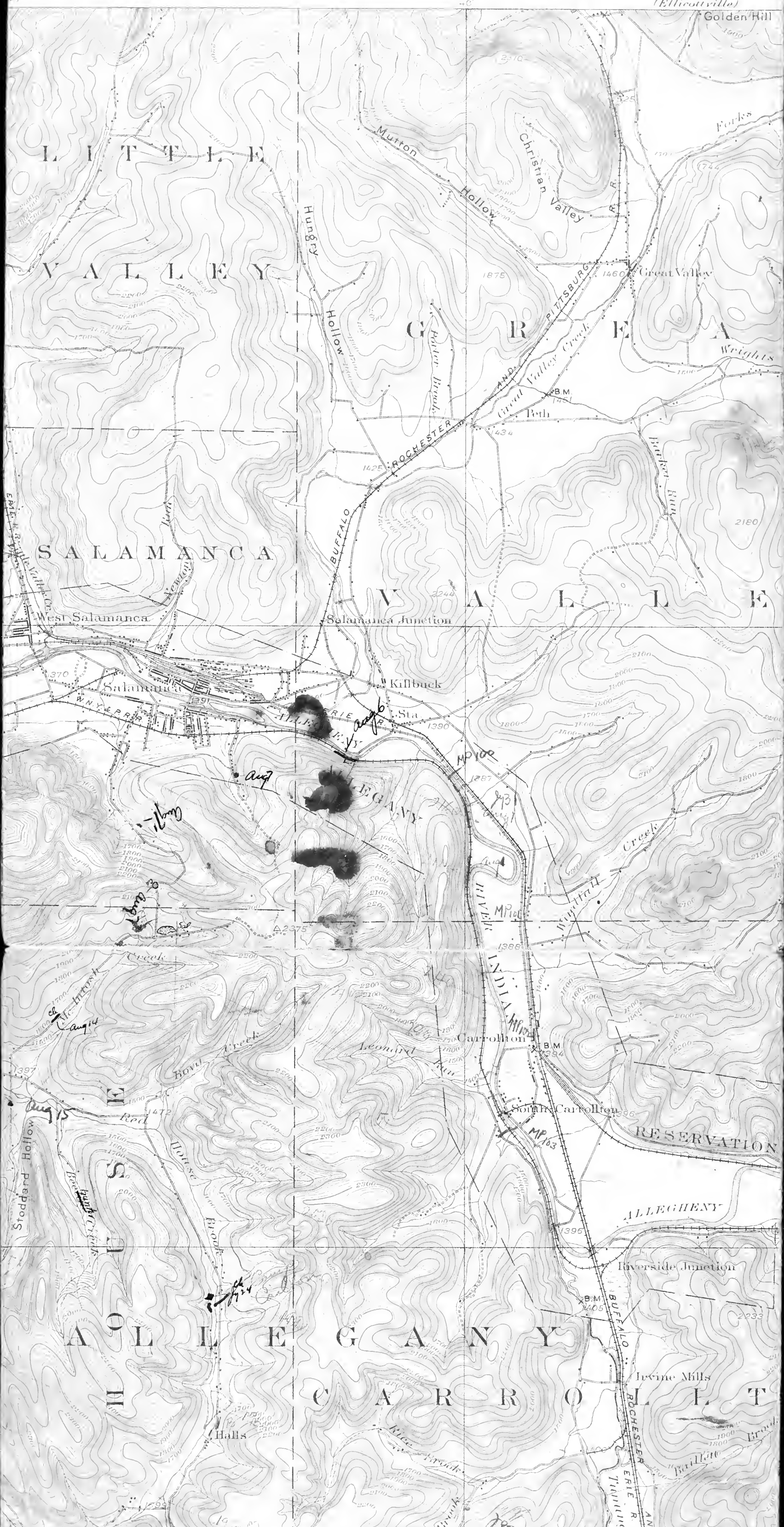
CONVENTIONAL SIGNS

Figure 133 Bird's-eye view of Allegany State Park

DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

STATE OF NEW YOR
REPRESENTED BY TH
STATE ENGINEER AND SUR

(Ellicottville)



ENGRAVED SEPT. 1899 BY U.S.G.S.

45' | 40' | *(Bradford)*

H.M. Wilson, Geographer in charge
Control by W.J. Peters and J.H. Jennings.
Topography by J.H. Jennings and C.C. Bassett.
Surveyed in 1897.

Bassett
Jennings

Scale $\frac{1}{62500}$

Contour interval 20 feet
Datum is mean sea level

MAPS OF THE UNITED STATES

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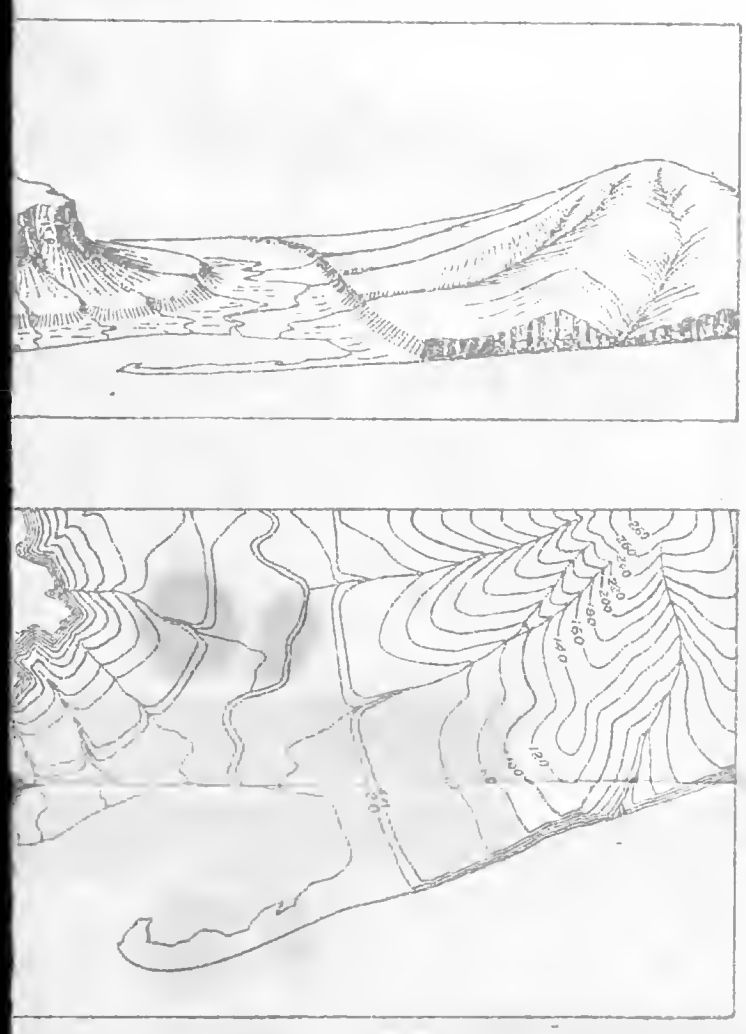

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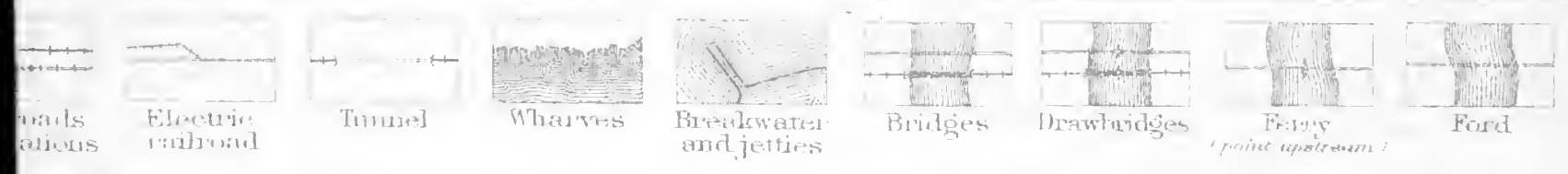
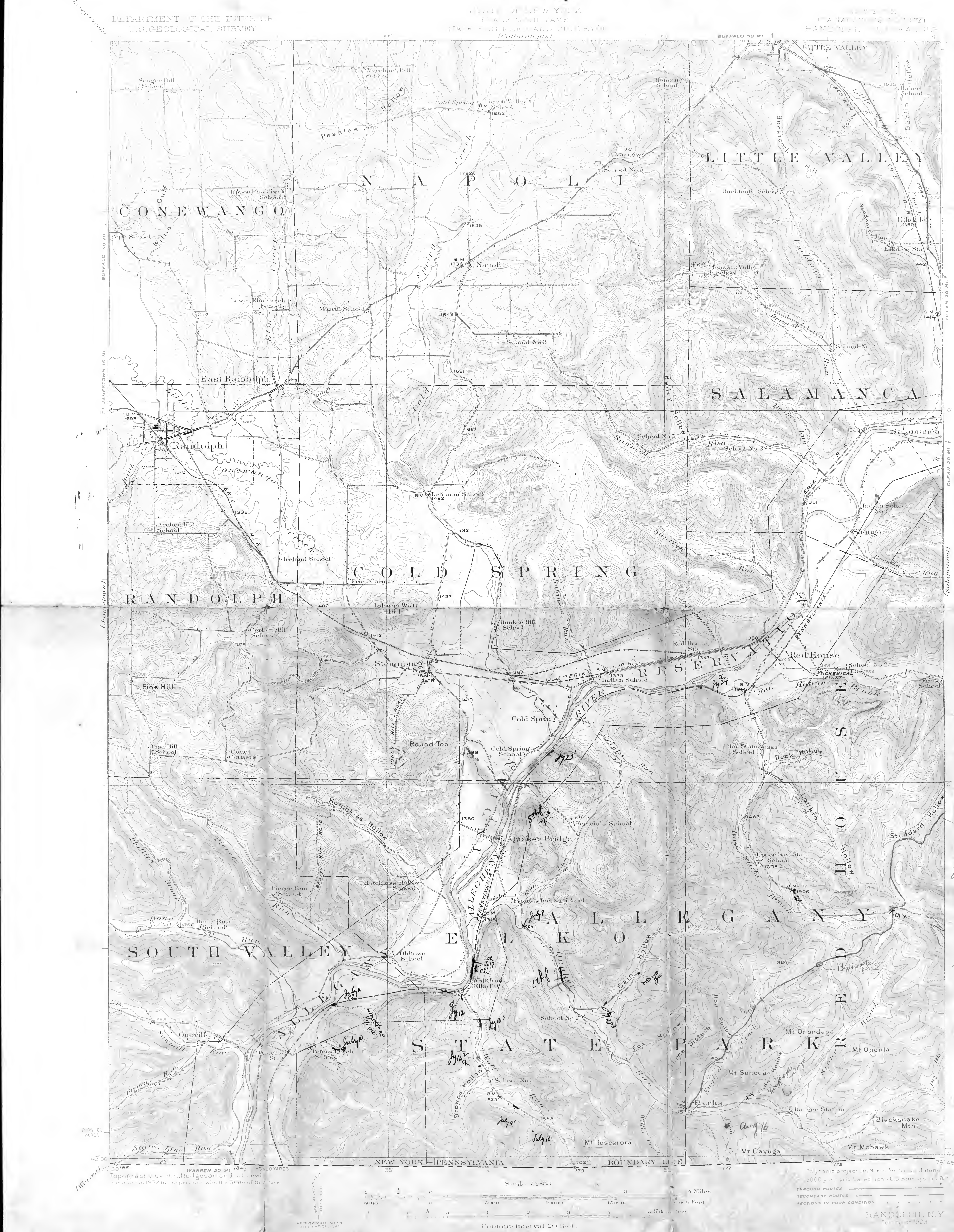
CONVENTIONAL SIGNS

CULTURE
(printed in black)



WATER
(printed in blue)

WOODS
(when shown, printed in green)


DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY
STATE OF NEW YORK
(Cattaraugus)
BUFFALO 50 MI
LITTLE VALLEY
Seager Hill School
Merchant Hill School
Hollow
Cold Spring
Pigeon Valley School
Peaslee
Creek
N A P O L I
CONEWANGO
Upper Elm Creek School
Gulf
Willis
Pope School
BUFFALO 60 MI
Napoli
Spring
Lower Elm Creek School
Merrill School
School No 3
Elm
East Randolph
JAMESTOWN 15 MI
Little
Randolph
Conewango
Cold
Lebanon School
ERIE R.R.
Archer Hill School
Creek
Ireland School
COLD SPRING
Price Corners
RANDOLPH
(Jamestown)
Johnny Watt Hill
Corbett Hill School
Steamburg
Pine Hill
Pine Hill School
Carr Corners
JONES HILL ROAD
Round Top
Cold Spring School
Cold Spring
Hotchkiss Hollow
BRALEY HILL ROAD
Hotchkiss Hollow School
Pierce Run School
Phillips Brook
Pierce
Bone
Bone Run School
Run
SOUTH VALLEY
Oldtown School
Onoville
Sawmill Run
Onoville Sta
Peters Creek School
Limestone Hollow
Browns Run
State Line Run
Hansen School
The Narrows
School No 5
LITTLE VALLEY
Bucktooth Hill
Bucktooth School
Lees Hollow
Dublin Hollow
Baker School
WESTERN NEW YORK
ERIE R.R.
Elkdale
Woodworth Hollow
Elkdale Sta
West Pleasant Valley School
Bucktooth
Branch
School No 2
Run
OLEAN 20 MI.
SALAMANCA
Bailey Hollow
Drakes Run
Sawmill Run
School No 5
School No 3
Salamanca
Indian School No 1
Shongo
Sunfish Run
Breeds Run
(Salamanca)
Robinson Run
Bunker Hill School
PENNSYLVANIA
Red House Sta
RESERVATION
Red House
Indian School
CHEMICAL PLANT
School No 2
Frank School
RIVER
Red House Brook
Crick Run
Bay State School
Beck Hollow
Lonkto Hollow
Ferndale School
Quaker Bridge
Stoddard Hollow
Upper Bay State School
Bay State Brook
Friends Indian School
ALLEGHENY
PENNSYLVANIA
ALLEGANY
ELKO
Wolf Run
Elko P.O.
Cain Hollow
Quaker
School No 2
Fox Hollow
Three Sisters
STATE PARK
Holt Hollow
Mt Onondaga
Mt Oneida
Mt Seneca
English Creek
Slide Hollow
Stony Brook
School No 3
Browns Hollow
Frecks
Ranger Station
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Mt Cavuga
Mt Mohawk
NEW YORK — PENNSYLVANIA BOUNDARY LINE
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RANDOLPH, N.Y.
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Jy 24
Jy 23
July 7
Jy 17
July 14
Jy 12
Jy 16
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Jy 16
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Jy 23
Aug 16
Locate Buffalo Camp Exp.

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2. Surveys of areas in which there are problems of average public importance, such as most of the basin of the Mississippi and its tributaries, are made with sufficient accuracy to be used in the publication of maps on a scale of $\frac{1}{62500}$ (1 inch = nearly 1 mile), with a contour interval of 10 to 25 feet.

3. Surveys of areas in which the problems are of minor public importance, such as much of the mountain or desert region of Arizona or New Mexico, are made with sufficient accuracy to be used in the publication of maps on a scale of $\frac{1}{125000}$ (1 inch = nearly 2 miles), with a contour interval of 25 to 100 feet.

A topographic survey of Alaska has been in progress since 1898, and nearly 27 per cent of the area has been mapped. About 10 per cent of the Territory has been covered by reconnaissance maps on a scale of $\frac{1}{625000}$, or about 10 miles to an inch. Most of the remaining area surveyed in Alaska has been mapped on a scale of $\frac{1}{250000}$, but about 4,000 square miles has been mapped on a scale of $\frac{1}{62500}$.

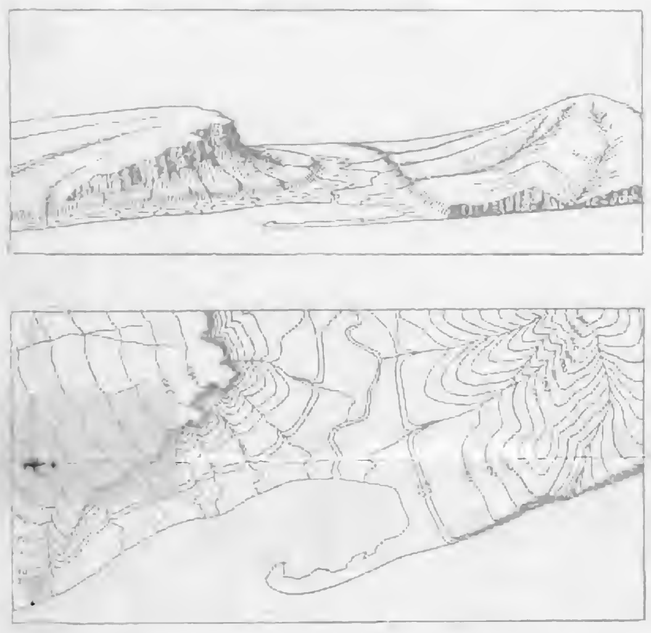
About half of the Hawaiian Islands has been surveyed, and the resulting maps are published on a scale of $\frac{1}{62500}$.

The features shown on these maps may be arranged in three groups—(1) water, including seas, lakes, rivers, canals, swamps, and other bodies of water; (2) relief, including mountains, hills, valleys, and other features of the land surface; (3) culture (works of man), such as towns, cities, roads, railroads, and boundaries. The conventional signs used to represent these features are shown and explained below. Variations appear on some earlier maps, and additional features are represented on some special maps.

All the water features are represented in blue, the smaller streams and canals by single blue lines and the larger streams, the lakes, and the sea by blue water lining or blue tint. Intermittent streams—those whose beds are dry for a large part of the year—are shown by lines of blue dots and dashes.

Relief is shown by contour lines in brown, which on some maps are supplemented by shading showing the effect of light thrown from the northwest across the area represented, for the purpose of giving the appearance of relief and thus aiding in the interpretation of the contour lines. A contour line represents an imaginary line on the ground (a contour) every part of which is at the same altitude above sea level. Such a line could be drawn at any altitude, but in practice only the contours at certain regular intervals of altitude are shown. The line of the seacoast itself is a contour, the datum or zero of altitude being mean sea level. The 20-foot contour would be the shore line if the sea should rise 20 feet. Contour lines show the shape of the hills, mountains, and valleys, as well as their altitude. Successive contour lines that are far apart on the map indicate a gentle slope; lines that are close together indicate a steep slope; and lines that run together indicate a cliff.

The manner in which contour lines express altitude, form, and grade is shown in the figure below.



The sketch represents a river valley that lies between two hills. In the foreground is the sea, with a bay that is partly inclosed by a hooked sand bar. On each side of the valley is a terrace into which small streams have cut narrow gullies. The hill on the right has a rounded summit and gently sloping spurs separated by ravines. The spurs are truncated at their lower ends by a sea cliff. The hill at the left terminates abruptly at the valley in a steep scarp from which it slopes gradually away and forms an inclined table land that is traversed by a few shallow gullies. On the map each of these features is represented, directly beneath its position in the sketch, by contour lines.

The contour interval, or the vertical distance to lies between one contour and the next, is stated at the bottom of each map. This interval differs according to the topography of the area mapped; in a flat country it may be as small as 1 foot; in a mountainous region it may be as great as 250 feet. Certain contour lines, every fourth or fifth one, are made heavier than the others and are accompanied by figures showing altitude. The heights of many points—such as road corners, summits, surfaces of lakes, and bench marks—are also given on the map in figures, which show altitudes to the nearest foot only. More exact altitudes—those of bench marks—as well as the geodetic coordinates of triangulation stations, are published in bulletins issued by the Geological Survey.

Lettering and the work of man are shown in black. Boundaries, such as those of a State, county, city, land grant, township, or reservation, are shown by continuous or broken lines of different kinds and weights. Metaled roads are shown by double lines, one of which is accentuated. Other public roads are shown by fine double lines, private and poor roads by dashed double lines, trails by dashed single lines.

Each quadrangle is designated by the name of a city, town, or prominent natural feature within it, and on the margins of the map are printed the names of adjoining quadrangles of which maps have been published. Over 3,000 quadrangles in the United States have been surveyed, and maps of them similar to the one on the other side of this sheet have been published.

The topographic map is the base on which the geology and mineral resources of a quadrangle are represented, and the maps showing these features are bound together with a descriptive text to form a folio of the Geologic Atlas of the United States. More than 200 folios have been published.

Index maps of each State and of Alaska and Hawaii showing the areas covered by topographic maps and geologic folios published by the United States Geological Survey may be obtained free. Copies of the standard topographic maps may be obtained for 10 cents each [illegible] sold at different prices. A discount of [illegible] per cent is allowed on orders for maps amounting to $5 or more at the usual price. The geologic folios are sold for 25 cents or more each; the price depending on the size of the folio. A circular describing the folios will be sent on request.

Applications for maps or folios should be accompanied by cash, draft, or money order (not postage stamps) and should be addressed to

THE DIRECTOR,
United States Geological Survey,
Washington, D. C.

January, 1924.

CONVENTIONAL SIGNS

CULTURE
(printed in black)

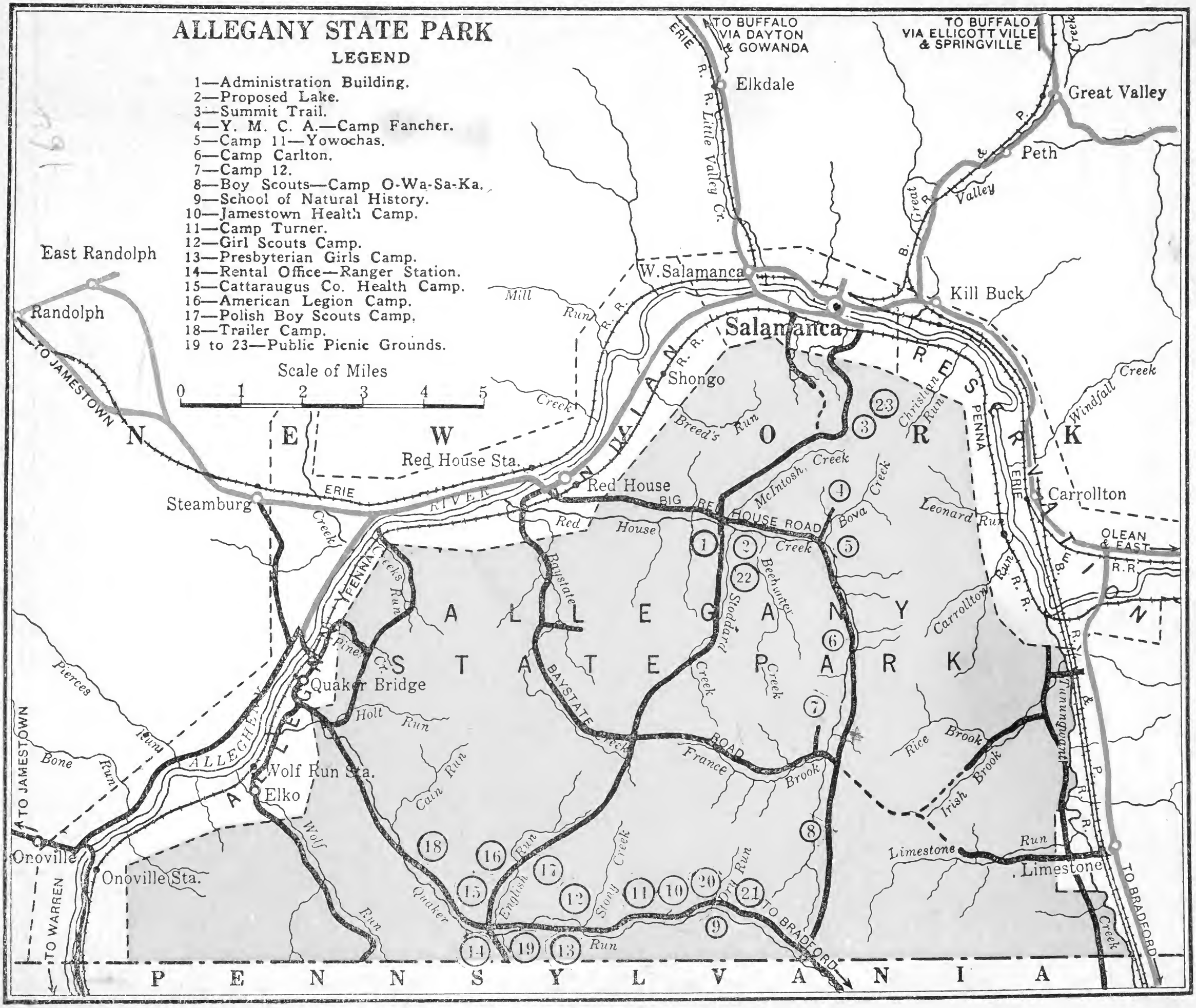
RELIEF
(printed in brown)

WATER
(printed in blue)

WOODS
(when shown, printed in green)

A FEW FIGURES REGARDING THE PARK

Area 65,000 acres; distance around boundary 45½ miles; highest elevation 2475 feet above sea level; distances from Administration Building to, Quaker Run Camping area 9 miles, Salamanca 7 miles, Olean 25 miles, Jamestown 29 miles, Bradford 13 miles.



Leach Pub. Co., Inc., Salamanca, N. Y.

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HEADQUARTERS ADDRESS:

Administration Building,
Red, House N. Y.
Phone: Steamburg, 13-A

RENTAL OFFICE ADDRESS:

(June 1st to Sept. 15th)
Quaker Bridge, N. Y.
Phone: Steamburg, 26-C

Knapp	20'
Oswego	100'
	120
Cattaraugus	
Sangerfield	100'
Salamanca	30'
Smith	140'
Panama	30'
	300

Chadakoin	
Ellicott	270'
Bentsville	150'
	420'

NOTES ON NO. Peters [illegible] July 10 P.

Round-Trip 30 miles

Handlevelling from [illegible] intersection

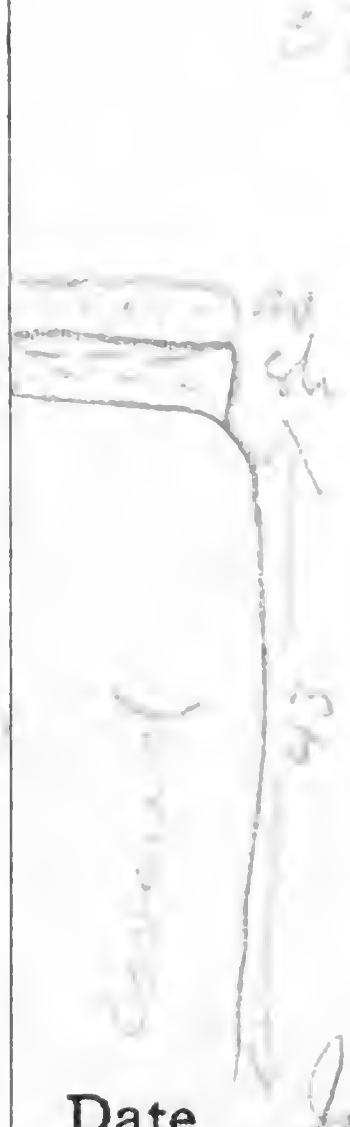
0'–43' — Covered.

5–7 43' about 3' of soft [illegible]

sandy shale [illegible] thick platy because of the [illegible] loose jointing and fracturing [illegible] in the shale. Sandy [illegible] with no [illegible] fossils. The soft shale is capped by hard sandstone showing irregular fracture and abounding in [illegible] plant remains as well as invertebrates. [illegible] are fairly common. [illegible] and a Chonetes [illegible] abundant [illegible].

43'–49' ± hard sandstone, breaking in places into plates [illegible] SS. calcareous [illegible] X [illegible] S. dignitas & Chonetes abundant but usually localized in bands or lenses.

Between 10th & 11th steps rock is mostly covered, but an exposure which at about 53' contained good specimens of Camarotoechia, [illegible] and S. dignitas in abundance.



11–12th steps — mostly covered. At top of 12 and in 13th step is thin-bedded shale, reddish on surface of chips but chocolate brown on a fracture surface

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Date July 10, 30 Author

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[illegible] Camarotoechia [illegible] [illegible] [illegible]
[illegible].

13-1' at top of 13 is about 10' soft
[illegible] [illegible] thin bedded [illegible] shaley [illegible] in
a few places are calcareous arenaceous
lenses. S. [illegible] & Camarotoechia are
common, also Leptaena & [illegible]
Should be photographed [illegible] coming exposure X
is behind last house [illegible] roadway on [illegible]
bank of gully.

400 paces from last exposure is a doubtful
outcrop of Chemung calcareous ss & so
abounding in Productella. One bed is
nearly completely made up of these shells.

460 - Steep bank on N side creek -
outcrops of thin bedded, platey ss with
Productella. The big slabs in the bank
are Chemung beneath the soil.

750 Spring [illegible] [illegible] — suggestive of a
conglomerate band.

July 11

NOTES ON NO. Allegany River outcrop north of Peter Creek School. P.

Exposure a little west of bend in Allegany. About 250' along river and ' high. Exposed also above R.R. Green & chocolate ~~shales~~ sandy shale and lenticular cross-bedded, thin & ~~thick~~bedded ss. Some of the layers are rippled. S. disjunctus Camarotoechia & Athyris are most common. Fossiliferous slabs are abundant along the river's edge.

Mileage 30 miles

July 11, 30

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NOTES ON NO. Wolf Run at Hwy Jef 16 P.

about 300 yards from highway
is outcrop of heavy, coarse sandstone
without fossils. Exposed also further
upstream with expansions, small; the
lowest one, spring source from ss. about
15 or 20' above gully. A small collection
was obtained from a loose block.

July 16'

Ditch on south side road contained
small pieces sh, ss & conglomeratic ss.
with Rhynchonella, & Leptaena, & a large
variety of Camarotoechia. Strata not
favorable to favor of fragments on in
place but they appear to be not far
removed from their bed.

July 16'

Small exposure on SW side of road
thin-bedded ~~sh~~ sandy shale
shale. Strophomena Leptaena, in place
in great abundance.

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July 16³

Bed & E banks of Wolf Run about 1/2 mile S of Jy12. Small exposures mostly of thin-bedded, lenticular sandstones and sandy shale. "S. disjunctus" occurs abundantly & is common in calcareous bands. Leioptera is common. The fauna is same as July 16² & Jy. 12.

NOTES ON NO. Pa R.R. N of Elko P.O. P. ....

July 17.

Outcrop about 650 paces long located 350 paces N of P.O. Similar lithological to Elko Mt. exposure Fauna also like that of Elko Mt. S. disjunctus, Productella, Camarotoechia and Athyris is abundant. Edmondia rare. These rocks are also exposed on the highway above the R.R. cut. Counting these exposures the ~~vertical~~ exposed thickness is about 50 or 60'.

Photo in the R.R. cut
Highway exposure .35 miles N of Elko P.O.

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NOTES ON NO. Buffalo Comp. July 21. P.

Measuring from Creek level

0'–5'5" — 1st 3'5 covered by talus. In the remaining two feet are sandy shale and lenticular calcareous ss. S. deflexitus? is common in thin layers of thicker lenses. Fossils are not abundant outside of these beds. A pteron, a few Camarotoechias and red-like bryozoans were the only other fossils noted.

3'5" covered

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NOTES ON NO. July 23. P. ....

Jy 23 – 5' exposure Chemung Pine Creek. Shaly ss., massive, no fossils.

Jy 23¹ – Railroad cut 2 mi N of Quaker Bridge. Loose ss and weathered calcareous ss blocks in steep slope. Probably weathered out of bed-rock below. Abundance of smaller bands of slabs [illegible] to this conclusion. Pecten, Mytilarca, Grammysia, Glass-sponge, Camarotoechia, S. disjunctus?

Jy 23² – Small exposure heavy bedded shaly ss. with usual Chemung assemblage.

Jy 23³ – Small roadside Exp. ss. few fossils. Large S. dis.

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NOTES ON NO. ..... July 29 P. .....

Jy 20 — Rock covered slopes of hills
of so. Dalmanella cc.

Jy 21 Camp Carleton

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NOTES ON NO..... P.....

July 25

Jy 25 – Exposure on hill south of Salamanca – Tuscarora cross-bedded ss and sandy shales – S. dejunctus c, Meristella sc

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NOTES ON NO. .... July 27 P. 7

Quaker Run. —

Exposures of ss & sh in the bed and banks of the stream — intermittent exposures for about 1/4 mile — lenticular cross bedded, sometimes rippled sandstones interbedded with irregularly fracturing sandy blue grey shale. This shale has a [illegible] purple cast. In the exposures farthest ~~west~~ east there are contorted ss layers forming concretion-like masses in the stream bed. Ripple marks are common.

Fossils are abundant in calcareous ss. S. disjunctus a.
Athyris r.
Camarotoechia cc
Leptodesma r.

Photos to be taken

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NOTES ON NO. Exposures 2 3/4 mi. N. of S. Carlton P. .....

Exposures seen first going S down Penn. RR tracks 1085 paces 1/2 miles of stream flowing between A & N of Allegany in NC quadrad. The exposures are exactly opposite mile post 100-16 on the R.R. 18-20' of rock is exposed mostly crumbly friable shale and so. The shale is olive green in color crumbles easily & small thin slips split from a rather step faces. From R.R. level at MP 100-16 are about 11' of shale followed 5-10' or more feet of heavy bedding of calcareous sd and so. alternating with shale of the same kind. The so. in this exposure are fairly persistent, the beds just above the shale contain Schizonella and Schellwienella in some abundance. These fossils were formerly seen only in loose pieces in the gladral river gravels or in shale material along RR cut see Jy 24.

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Spirifer disjunctus is abundant and also a shell that may be a Leiorhynchus. These beds represent probably the lowest Chemung in the whole Park area.

4 pictures taken

Total distance of exposure 721 paces.
1534 paces south of M.P.

From pace 534 the rocks is covered for 600 paces. then exposed for 500 more

M.P. 103-13 is about 50 yds south of end of road

West valley road ends exactly 1 mile from S-turn at 1396' in C subquad.

Exposure 600 paces N of M-P 102-14 and another in a small gully 254 pace N of Mile Post - M.P. 102-14 is opposite switch.

M.P. 100 from Oil City, 13 - 14 from Olean

NOTES ON NO. August 6 P. .....

Salamanca

Long exposure along P & P
tracks 1½ mi E of Salamanca
Exposures 250 - 300 yds long 20 - 40'
high. On one gully 250 paces from
1st gully (permanent gully) on map
the rock is exposed up to about
125 - 150' not continuously however
There are about 80' of continuous
exposure mostly black shale, very much
eroded on the surface, crumbling
to irregular fragments or to thin
chips. On the permanent gully
mentioned above numerous
fragments at the base.
The shale for 15' from the
base is succeeded by about
5' of no in heavy beds separated
by thin layers of shale or
mudstone. The mudstone is
fairly gritty when touched to

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the teeth. The [illegible] are [illegible]. At the top about 125-30' from the base are [illegible] [illegible].

Fossils are abundant but not well preserved. The fauna resembles ~~that~~ seen at Jy 31 & Aug 1.

Genera seen are
Aviculopecten r.
Orbiculoidea rc
Camarotoechia not abundant
Spirifer dis c
Schuchertella rc
Dalmanella rc

The exposure is 500 paces in length from prominent gully.

NOTES ON NO. Aug 7 P. .....

Exposure of hard cross-bedded
sand etc. exposed for about 20'
at top of exposure is a thick layer
about 2' of calcareous, abounding
in fossils. Other fossils seen
were Camerotoechia, Eatonella,
Dalmanella, Spirifer, Leptodesma,
Productella. Collecting is not good.

Aug 7— small exposure of sh. + ss
about 1' vertical. Camerotoechia
contracta common

Aug 7— Outcrop of 20' of dark fossil
green sh. + ss. the bottom of which
is exactly 50' below the top of the
hill. The shale is blocky, fragments
are mostly small chips. The ss
are medium-fine-grained weathering
to light green. The sh. contains
much fine sand. Fossils
except for Spirifer consist of
fragments of plants and bedding

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The impression of a Lingula was also seen. The sandy shale is characterized by minute wrinkling and development of mica.

Age — There is a brook at the base of the hill which may be held up by the Salamanca or Killbuck. Conglomerate blocks are wholly lacking. Scattered loose fragments of red shale suggest a Cattaraugus age. I incline to Oswayo for its age.

NOTES ON NO. Aug 72 P.

McIntosh Creek Rd. - Exposures below Summit Camp and between Salamanca road:- 400 paces from Intersection new road intersects with old. From new road & old intersection
S 40°E - 250 paces
S 70 E - 115 "
S 82 E - 615 " to bridge

Aug 73
925 paces from Intersection is exposure of sh. 100 paces long exposing 1 of shale. Rock is bright green ~~and red~~ thin-bedded ss and soft rather blocky red shale. No fossils were seen

Aug. 74 - Brown & green coarse ss and sh. & ss-sh. cong.

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NOTES ON NO. Aug 8. P. 1.

Salamanca - Peck highway -

upper Rd - Outcrops occur in the south gutter and bank of the road nearly down to its intersection with the main road. This Chemung is also on the lower road. It is much higher stratigraphically than the exposures along the RR tracks to the east. S. disjunctus in large forms is common, Camarotoechia also. Athyris occurs in the lower beds. Dalmanella and Schuchertella were not seen. Aviculopecten occurs in broken specimens.

S25W 169
S65W 63
S90W 50
N61W 167
N25W 322
N36W 81
N70W 60
N83W 120

Main Road

Branches off old road going up Parker Hill 250 paces N of small bridge.

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S 19W 180 -
S 8W 100 - upper Road at 40 paces
S 89W 40
N 63W 156
N 37W 94 - exp. + blocks at beginning
N 28W 200 - actual exp. at end of this step.

N 66W 105
N 85W 90
S 74W 230 at end of this ~~sight~~ is junction with upper road. [illegible] exposure here on south side of road, + exposed for 150 paces east
N 89W 636 - Rock is exposed along this entire interval either as actual bed rock or slabs in the soil. at the end of the exposure where there is a sharp curve there is an excellent ~~exposure~~ exposure on the inside of ~~the~~ the curve. Here were seen Chonetes, [illegible], Leptaena, Camarotoechia, + [illegible].

S 18W 90
S 25E 422 - at the beginning of this interval rock was exposed for about 200 paces but

above it there are only slabs
in the bank.

S23E 137

S28W – 140 at the end of this interval is an exposure about 5' vertical and some 30 paces horizontal.

S3E 85
S29 E 260
S57E 130
S74E 200
N42E 150 at the end of this interval is the Sweet Water Spring on the NE side of which is a small exposure of greenish grey flaky shaly ss. with considerable mica flakes. No fossils were noticed in a short examination

~~This may be the Cattaraugus shale.~~

S4W 180
S28E 90
S40E 236 – at 163 paces occurs a heavy bedded conglomeratic sandstone undoubtedly the Salamanca. The pebbles are

Date.................................... Author..

mostly small, Clay balls and small limonite masses are not infrequent. Above the conglomerate is rather blocky sandy shale brownish green in color and without fossils. This shale shows the minute wrinkling seen yesterday at Aug 7^3 as a matter of fact this Salamanca out crop here & the shale are not far below the exposure of yesterday which can be seen across the valley. Rock is exposed for the whole interval

S45E 300 at 135 and to the end of the interval fossils are abundant in ss. + sandy shale slabs.

S60E 440 Same sandstone slabs at about 250 and for some distance dark greenish brown shales of the Cattaraugus.

NOTES ON NO. .... P. 3

S85W

S27W 120 — at end of interval at bend thin bedded, crossbedded ss. no fossils

S2 E 100 — Same green ss.

S41E 140

S56E 250

S12E 60

S18W 275

S35W — 118 at 77 Comes thin irregularly bedded ss. greenish in color

S54W 110 — From 0-70 these rocks occur they are the same as in cut by com-poso first south over Summit hill

S86W 142

S80W 136 to top of hill in front of "Pop" stand

S41W 100

S58W 58

S73W 284 For the first 100 paces of this interval there are greenish grey fine-grained ss,

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scatter thinly and irregularly bedded. Fossils are rare but a large Camarotoechia is seen most. Wood is common. At the end of the cut is an overpass under the road on the W side just east of the overpass (toward Salamanca) is a cut in much fractured, leached sandstone. At the overpass and at its N entrance is a few feet of soft, sandy green-grey shales much fractured. Leached calcareous lenses abound in a Spirifer similar to S. disjunctus. Clay balls & limonite concretions are abundant in all the sandy rock.

S85W 650 At 360 occurs the outcrop S of the overpass on the S side of the road. It is green sandstone, thin-bedded

and cross-bedded, precisely like
~~that~~ at the 2.4 miles from
Salamanca. Above it is green
red-weathering shale. At this
same exposure were found
coarse light brown ss. slabs
containing Modiolas. The
slabs were big and probably
not far out of place. Some
were collected also on top of
the exposure.

N69W100
N42W184 here the rd. contacts
~~with~~ ~~the~~ an old road extending
S85E up to about the compass.
The distance from the summit is
.65 miles. Along the road are
fossiliferous light ss. slabs.

N85W414 (.25 miles) — At ~~the~~
intersection of ~~the~~ main Rd
and State Park Ave ~~there~~
is a field of ss and cong
blocks on ~~the~~ N side of the

P.17

Road. This top of this cong is
about opposite ~~the~~ small school
at about 2000 on 2050' facing
a flat. I believe these blocks
belong to ~~the~~ Salamanca or
at least to ~~the~~ SS or ~~the~~
bed we have called Sal. The
blocks are a coarse ss. ~~with~~
a few small pebbles. The
Modiola slabs were above
the Sal. just as they did not
far from Salamanca city

NOTES ON NO. Aug 14 P. 5

Exposure on curve - Thin bedded
Oswego [illegible] in road - the
strike is mostly light green, fine
grained, [illegible] on the slope
there is much shale in small
fragments. The shale is red. Some
of the chips are red on the outside
but ~~rather too~~ green inside
This leads to the supposition ~~that~~
the shales are naturally green but
oxidized to a red color subsequently
to exposure. This may be true
also of the Cattaraugus.

Aug 14' — 1.3 miles ~~from~~ SW of
junction of State Pk Ave &
McIntosh Hollow rd. is a
exposure of thin
bedded ss. with fossils. The
latter appear to be Chemung
in age. S. disjunctus is
abundant with C. contracta
Other forms are indicated by

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Leptodoma ect
Mytilarca
1.4 miles from junction comes
fork over to O.L. Building

NOTES ON NO. .... P. 6

2.40
.95
.45

To upper rd. intersection – .5

To exposure above junction (Oknotes) – .4

To Sweet Water Spring – .8

To Salamanca – .25

To thin bedded sandstone at curve – .45

To summit – .7

Summit to old rd – .65

To Park Ave Rd —— .25 miles

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NOTES ON NO. Aug 15 P. ....

English Creek Road - Going NE from Fields - exactly 2 miles from Fields [illegible] Columnar blocks could be observed on the roadside. About 1 mile N of this point is the sign pointing to Rose Spring [illegible] [illegible] of Spring to [illegible]

Aug 15. — Exposure in Owyhee - exactly 2 miles from Fields at the south end and about 1 mile exposure. The rock is chiefly [illegible], [illegible] than [illegible] from leaching and brown from the great amount of iron therein. When fresh it is greenish & calcareous. Clay balls, limonite concretions & [illegible] are common. Red shale occurs in the lower part. Fossils are poorly preserved and few in number. A large [illegible] is the most abundant. In places the rock is a shell breccia. Wood is abundant.

0.20

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From here to 3.5 miles, ~~the~~ there
are exposures of [illegible] of the same
kind of rock but no fossils were
seen. After 3.5 there are no
more exposures till the intersection
with the Bay State Road.

Aug 15 — Oswayo is at contact of
Bay State Rd. — [illegible]
[illegible] infer from contact
[illegible]
[illegible] the same rock
is exposed for 1 mile along the
main road to the point where
the Bay State road forks east
to go to Red House Road. At the
east road intersection the rock is
sandy shale & shale, thin bedded
rather fossile. This I believe
represents the base of the
Oswayo. Along ~~the~~ the roadside
for .55 miles there are
undoubted Oswayo fragments

NOTES ON NO. ..... P. .....

.85 miles at bend is exposure of more heavy bedded ss. The exposure here extends about 100 yds. southwest along the road of appears still to be Oswayo for the whole distance (.85 mile) fragments were abundant on the roadside

350 paces west of (1.1) there are rather heavy-bedded ss that may represent the contact with the Oswayo and Catskill certainly the rock at 1.1 and for 350 paces back is a soft sandy shaly earth and fine & clay stone earth. The shale is closely cleaved and breaks into irregular small blocks. The color is green chiefly but in places is weathered to red. Fossils are not abundant but in addition to Psilophyton and Spirifera were found

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The surface of much of this shale
is rippled like that seen Aug 7

at 31.4 outcrop of broken greyer
and below it the Salamanca
cong. The Sal. is exposed in
big blocks just on the N side of
the road. Fossils from this
locality were all loose. The
Sal. cong. is exposed for fully
.2 mile

At 2.1 miles from Bay State Rd
Intersection is an outcrop of Chemung
exposed for about 200 yds.

NOTES ON NO. Ad Building P. .....

Beginning at curve N of Finch School —

N 86 E 150
N 70 E 168
N 76 E 110
S 76 E 231
S 87 E 136
N 88 E 382
S 76 E 54
S 62 E 185

Total distance 7 miles

Circle over to Ad Building from Mechanic Rd.

S 73 W 120
S 23 W 265
S 53 W 135
S 42 W 76 — Just across old Red House Rd
S 22 W 82
S 6 W 425 Ad Building on left of road

S 12 W 480 — Ad Building at 140

S 27 E 91
S 61 E 112 — Here is contact with Stoddard Hollow Road

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where there is an exposure of Chemung. The St. road is on the east side of the creek & extends S21W.

N36E 239

N63E 86 — Outcrop about 100 yds.

S69E 700 Along the gutter at this exposure are sandy greenish brown shales with few fossils. These are marked like the Athens grp.

At 373 is Bee Hunter Creek Road. 592 Bridge or B.H.Ck.

N76E 56

N51E 137 At 75 is bridge over R.H. Creek

N15E 40 — This crosses old R.H. road

N10W 85

N47W 363

N58W 163

N52W 100

N32W 70

N9W 60

NOTES ON NO. .... P. ....

N10E 191
N15W 100
N51W 86
N32W 95
N18E 110
N20W 85

Total circle 2,45 miles

Aug 15 — Exposure 6 mi. from McIntosh road — just below E of the old Building — Coarse heavy — irregularly bedded ss. with Schizodus, Mytilarca, Dalmanella

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NOTES ON NO. Aug 16 — P. ....

Coon Hollow — 600 paces south of Avalon Pike junction SS. & shale, similar to Buffalo Camp.

Aug 16' — 300' N of Pa-NY line small exposure, Chemung thin bedded ss + cong. Probably cut of Cole. The ss + cong (2 or 3') thick is succeeded by non fossiliferous bluish irregularly bedded ss.

Aug 16² — 1050 paces up Coon Hollow tributary small exposure Chemung SS + sh.

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NOTES ON NO. Aug 18. P.

Road between Red House + Bay State valley + 150 paces east of junction with main road is a small exposure in ~~north~~ gutter. ~~About~~ 5' of red + green shale is capped by a 1½" bed of ss. having Ptychoptera. This appears to be Cattaraugus, and only 155 paces west on ~~the~~ main road ~~the~~ Oswayo is exposed.

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NOTES ON NO. [illegible] 8 P.

Ref Pierce Rd — opposite

Scout Camp (Camp [illegible])

1 mile N of junction with

Pierce Brook Rd. [illegible]

[illegible]

Reeds [illegible]

[illegible]

pocket, [illegible] opposite

S of the road [illegible] mile

to Spring [illegible]

[illegible]

on [illegible] Pierce Brook

Road [illegible]

[illegible]

[illegible] for about

1/2 mile up the road suggesting

Wolf Creek Camp.

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NOTES ON NO. Aug 20. P.

Red House Rd - Going S. from intersection with France Brook Rd. 1/2 mile W on France Brook Rd. Rocks assigned to Wolf Creek occur and Spring .2 mile N of road intersection is about in Wolf Creek. The top of the Chemung is at about 1720!

125 paces South of intersection main (new) road branches off - following old road to top of hill.

Along the rd. hill collected slabs weathered out of Cattaraugus. Oswayo-Cattaraugus contact occurs about 800 paces below summit and Salamanca occurs probably at Spring 1500 paces from Red House Rd.

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NOTES ON NO. ~~Finch Indian School Exposure~~ P. .....

~~Hiking~~ Round trip = 15 miles

S9W 125
S30W 273
S39W 220
S43W 250
S22W 300
S33W 218 — Salamanca blocks abundant
S11W 76
S&E 240 — " " " — Outcrops on E side Rd.

S2W 282 — At the end of this stop in the creek (ground old shed) are Salamanca blocks in great abundance showing exposure to be not far off. Road is right next to stream and about 10' above it.

S23W 92 Salamanca blocks in road side

S8W 160 Conglomerate blocks often after the S23W92 interval are very rare. The bulk of the Salamanca outcrops is at the shale to stream at about 800'

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North-South shot - 715 600

Conglomerate blocks appear all along the road side on this elevation. But they are probably Olean. at 550 paces crosses end of old road which is at 1940' elevation. About 20' above this road occurs an outcrop of greenish ss - called by Lobeck Oswayo but it must be Cattaraugus. It may be the same horizon as that ~~#7~~ about 1/2 way below Summit Camp + Salamanca in field. Distance to this exposure from Camp Iwasaki is 1.4 miles.

S 7 E 280 Along here is exposed thin bedded, green + cross-bedded ss, with clay balls and a few Phycodes(?)

S 5 W 244 At the bend here is an exposure of slide rock - red shale - heavy bedded ss and brown ss

NOTES ON NO. ~~Wolf Run Lycoming Co~~ P. .....

Elko.

with limonite layers. Of course all the characteristics of the Oswayo but seems to be not high up enough. There are also traces of blebs, being irregular in bedding

S15°E 110

S45°E 579 — All along this outcrop is shown — Collegania is common.

S19E 500 — Oswayo all along way (may be top)

S20W 54

S41W 92

S73W 175

S56W 58

S33W 225

S47W 300

S31W 49

S20W 75

S17W 250 At 200 ft. high of small rise is a band of greenish grey thin bedded arenaceous shale. In the woods along the roadside

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in conglomerate masses, either Knapp or Olean

S29W 384
S45W 221
S41W 500' (197 paces)

197) 500
394
1160
985
185

(2.5'

500 feet N of the intersection is a mass of pebbles, yellow, long and coarse is probably the Knapp Creek.

Total distance 3.4 miles

NOTES ON NO. Cuy 21 P. .....

.45Mi E of Bradford junction
slabs + chasse of knapp in
soil.

1.75 miles E on Quaker Run Rd
from Bradford junction is an
exposure of Conway O. C. alleganian
Ocean in isolated pieces

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NOTES ON NO. Aug 21. P.

Chemung - thin bedded, cross-bedded purple weathering SS. exposed for about .2 mile. Fossils abundant, few kinds —

S. disjunctus Camarotoechia
Athyris c Productella c
Leptodesma Edmondia

To Ad. Building via E.C.

Aug 22. Bear Spring is about 50' above sign at road which is exactly 2.1 miles from 7 miles.

~~Quaker Run —~~

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NOTES ON NO. .... P. ....

N56E 250 Clearing apparently all way
N 32E 144
N48E 180
N32E 426
N26E 385 Total
N 9E 106 distance 3.4
N 1W 118 miles
N 1E 72
N17E 142
N26E 253
N20E 305
N12E 232 — [illegible] old Rd &
clearing app.
N21E 377

Bon Rem Road is .1 mile from English Creek trail

E

N

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NOTES ON NO. Stoddard Hollow Rd P.

Survey begun where west branch of Red House Rd goes west from main Rd. This is precisely .2 mile from where Bay State Branch joins main Rd. —

S88E120
N67E 84
N35E 71
N4E75 – chips of Oswayo in banks.

N15W120 – Oswayo all along
N14W 60 " " "
N24W225 Oswayo for 40 paces 114
From 114 on Oswayo is exposed

N10W311 Oswayo all the way
" " " "

N10E175

N16E79

N38E114 Green so. Possible Or.
N27E145 at 100 green sh.
predominant

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This is a possible contact

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N22E 173 — Green shale all way — some
N39E 70 — Hydrogen sulph c.

N77E 145 — ends exp. ends.
N43E 61
N18E 136
N 7W 144
N16E 68 — Pumped 55 + sh
N53E 200 at 80 Salamanca 1.25 mls
N88E 61
S60E 63
S38 E 200
S55E 103
S88E 142
N57E 90
N28E 33
N13E 153
N19E 205

20 56 [57] is exactly 1.75
miles at 154 Clemmy
Slabs in bank — big
clinkers

N38E 65 Clemmy all way