Contributed by R.E.L.

(22nd Annual Meeting - 25th Year of Assoc.)

SILVER ANNIVERSARY MEETING, SYRACUSE, N.Y.
New York State Geological Association
Annual Field Trip - April 28-29, 1950

Time and Place of Registration	Friday April 28, LYMAN HALL MUSEUM, Syracuse University. Direction signs will be displayed.
Accomodations	Leaflet with hotel information enclosed. There are many tourist homes and camps in and near Syracuse and there should be little difficulty in obtaining accomodation without reservation. A list of such places will be available at the registration desk.
Field Trips and Starting Times	Friday, April 28, 1.00 p.m. Eastward through the drumlin area to a Camillus gypsum quarry; then climbing the plateau escarpment to the extensive (abandoned) limestone quarries at Manlius. Return to Syracuse along the Onondaga bench overlooking the lake plain to the north. Saturday, April 29, 9.00 a.m. To Clark Reservation plunge basin lake, then across Onondaga valley to the Split Rock quarries. South to Cedarvale and one of the major cross channels. Up the escarpment to Lord's Hill coral reef, then to Tully moraine and part of the Upper Devonian stratigraphic section; the Tully salt wells; Cedarvale deltas, and Onondaga dam.
Lunches for Saturday	Box lunches will be supplied to those who purchase tickets at the registration desk on Friday.
Annual Dinner	Friday evening, 7.00 p.m. at Drumlins Country Club.
Prices	Bus tickets: Friday - approximately $1.00 Saturday - approximately $2.00 Annual dinner: $2.50

City traffic conditions and limited parking facilities at several stops make it necessary to limit the field trip parties to those who travel by the chartered buses. Tickets will be sold at the registration desk.

A prompt response using the enclosed postcard will be appreciated.

22nd meeting

Contrib. by R.E. Lee

FIELD TRIP GUIDE

for the

NEW YORK STATE GEOLOGICAL ASSOCIATION

SILVER ANNIVERSARY MEETING

SYRACUSE UNIVERSITY

April 28 and 29, 1950

Produced by the Geology Staff and members

of the Geology Club

The Present Geology Staff
at
Syracuse University

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James E. Maynard
Newton E. Chute
Louis W. Ploger
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Multer, H. Gray
Rima, Donald
Sargent, Carol
Sargent, Robert
Tesmer, Irving
Wetterhall, Walter
Woodmansee, Helen
Woodmansee, Walter
Woodside, Philip

Marilyn Cooper, Department Secretary

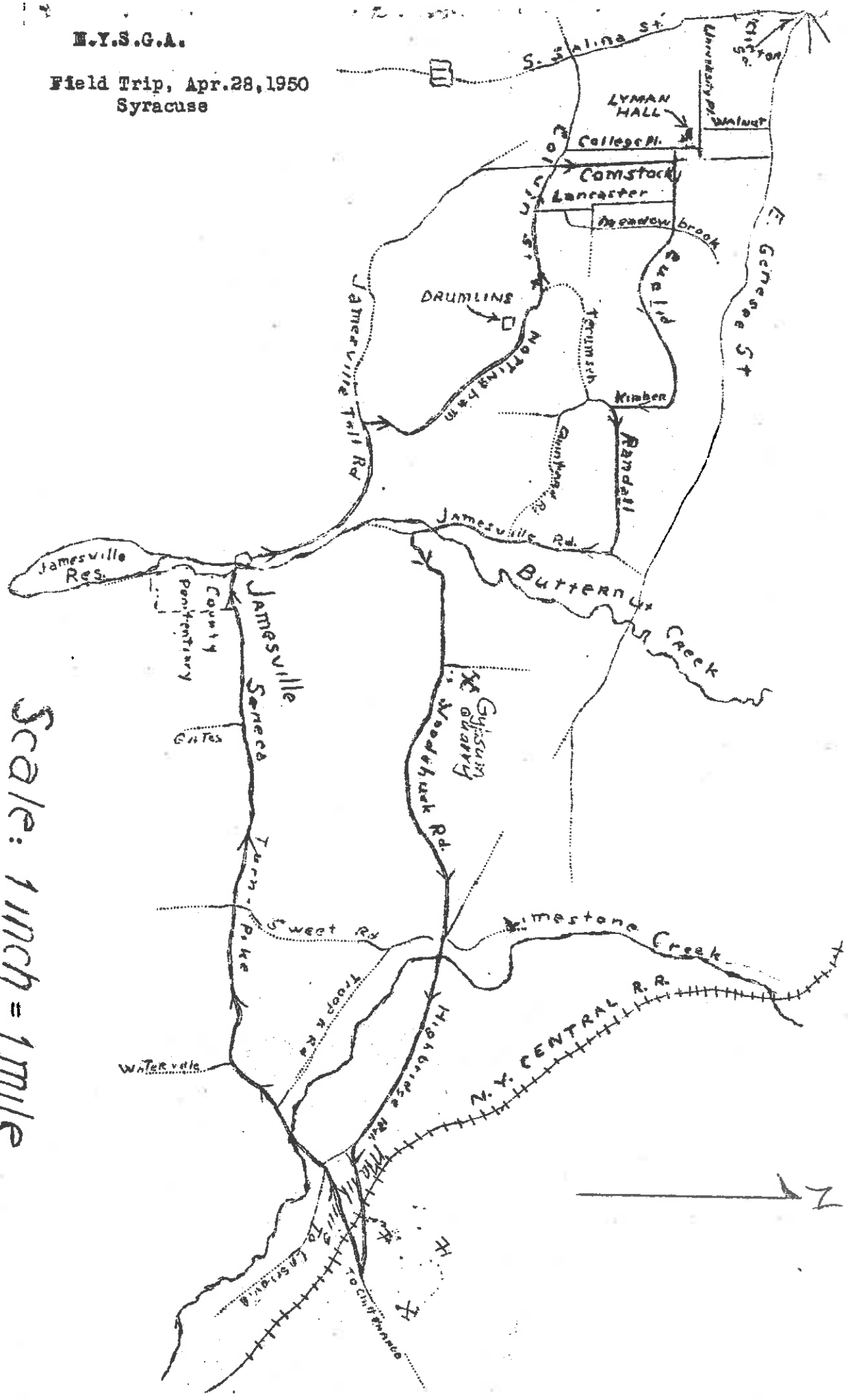
GENERALIZED COLUMNAR SECTION FOR THE SYRACUSE REGION

Thicknesses approximate*	Revised Nomenclature**		Older Usage
400	Ithaca sh and ss	Portage Group	Ithaca sh and ss
28±	Cornell sh and ss		
210	Sherburne flags		Sherburne
75	Geneseo sh		Genesee
25	Tully (3 div.) ls		Tully
165	Windom sh	HAMILTON GROUP	Moscow
8	Portland Point ls		
220	Ludlowville sh		Ludlowville
10	Centerfield hor.		
200	Butternut sh (Berwyn)		Skaneateles
40	Pompey sh and ss		
140	Delphi Station sh and ss		
5	Mottville ls		
160	Cardiff sh		Cardiff
85	Chittenango sh		
3	Cherry Valley ls (Agoniatite)		Marcellus
15	Union Springs sh		
100	Onondaga ls		Onondaga
0-12	Oriskany ss		Oriskany
6	Bishop Brook ls		
30	Pools Brook ls		
20	Jamesville ls		Helderberg
4	Clark Reservation		
4	Elmwood C waterlime		
5	Elmwood B ls		Manlius
6	Elmwood A waterlime		
33	Olney ls		
16	Rondout waterlime		Rondout
6	Cobleskill dol.		Cobleskill
6-10	Bertie waterlime	SALINA GROUP	Bertie
25-63	Camillus-Upper Gypsum		Camillus-Upper Gypsum
20-40	Camillus-Fiddlers Green		Camillus-Fiddlers Green
500	Camillus-Lower Div.		Syracuse Salt
700	Vernon sh		Vernon
300	Lockport dol		Lockport

* and ** Thicknesses and nomenclature taken from published literature

N.Y.S.G.A.

Field Trip, Apr. 28, 1950
Syracuse



Scale: 1 inch = 1 mile

New York State Geological Association

Silver Anniversary Meeting
April 28 and 29, 1950

Syracuse University
Syracuse 10, N. Y.

Field Trip Guide for Friday Afternoon
April 28, 1950

All participants are requested to travel by bus. To maintain even distribution of load in the buses, it will be generally desirable for each person to continue with the same bus.

All are requested to be in the buses promptly at one o'clock. Start will be at 1:15 sharp. Buses will be ready at the College Place entrance to the campus at Sims Hall dormitory, south of Lyman Hall.

The Friday trip will be eastward from the campus to Manlius village returning through Jamesville to Syracuse.

The trip of the afternoon will be through a belt underlain by Upper Silurian and Lower and Middle Devonian bedrock, capped by glacial and post-glacial deposits. Geomorphically, the route will pass through the foothill belt along the Allegheny Plateau front. Major physiographic features to be seen will be drumlins, pro-glacial river cross-channels, boulder delta of a Pleistocene pro-glacial river, ponded waters in cross channels, the Onondaga cuesta, the Lake Iroquois inundated lowland and North-South valleys inherited from the Tertiary and modified in various ways by glaciation, and the post-glacial Fiddlers Green gorge of Butternut Creek.

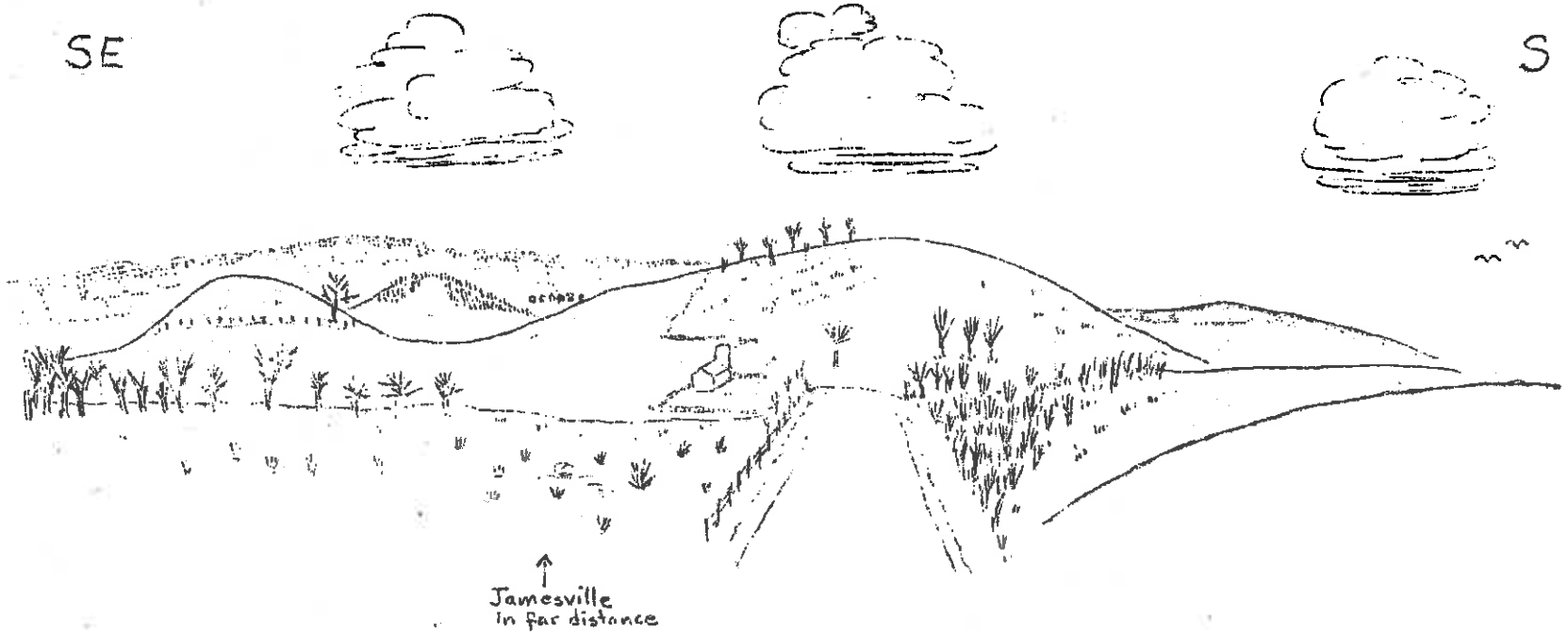
Read and look as you ride. Student guides are identified by orange ribbons, but there will be no lecturing.

1.4 miles from campus -- Going east along Euclid Avenue to Kimber Road. Meadowbrook cross-channel. Carried some drainage eastward into Butternut Valley from a high level pro-glacial lake in Onondaga valley(control level about 540'. Probably Fairchild's Hyper-Iroquois). (Ref. Fairchild.) Drainage apparently of short duration while the ice front lay immediately to the north. This is the lowest high level cross-channel. The Meadow-brook channel originally had a col-swamp and marsh in its course. Near its western end on the east side of Onondaga valley are some extensive sand deposits in an area now largely concealed by pavement and buildings.

.3 miles -- On the south (right) side of Euclid Avenue near the intersection of Euclid Avenue and Standish Drive is a cut in a drumlinoid hill exposing material seemingly wholly or in part of igneous origin and now being studied with a view to ultimate interpretation. This lies essentially along the strike of a known igneous dike crossing East Genesee St. but now concealed. (Ref. Maynard and Pioger)

Turn right (south) on Kimber Road to Randall Road. Passing through the Syracuse Drumlin belt.

1.3 miles -- turn left (east) on Randall Road.



View from Kimber Road
Looking south into drumlin area and escarpment beyond

1.2 miles -- turn right (south) on Jamesville Road.

The creek at our left (east) is meandering on a youthful glacio-lacustrine (Iroquois) plain, an anomalous feature repeated often in the region of continental glaciation.

At the right (west) is the east end of what Fairchild called "the handsomest glacial lake outlet channel in the state". This cross-channel is locally called the Rock Cut, or the D.L.&W. Railroad Channel. The east end of this channel, which lies about 540' A.T. is cut by a v-shaped deep ravine opening into Butternut valley. We will traverse this cross-channel on the return trip, and again on Saturday morning.

Also at our right and ahead where Butternut Creek emerges from the post-glacial Fiddler's Green gorge of which we shall see more later, an alluvial fan has been built. This fan merges with the alluvial plain below the bridge over the creek. Further downstream the alluvial plain lies superimposed on the Iroquois Lake Plain.

1.5 miles -- to Woodchuck Hill Road. Turn left (east)

Immediately on the right (south) side of the road, on the slope in the ditch is a small exposure of a shaly part of the Lower member of the Camillus formation, not far below the Fiddler's Green limestone member.

1.2 miles -- passing over what Fairchild mapped as a glacial delta. The deposit contains many large limestone boulders and it was probably deposited by the river which came out of the Clark Reservation plunge basin.

Intersection of Woodchuck Hill Road and Maple Drive. Here passing through a weak cross-channel which extends eastward along the cuesta front, and contains White Lake, Snooks Pond and Evergreen Lakes. Note the prominent Onondaga limestone-capped scarp and the cross-channel. Note also the plunge-basin (which held a beautiful lake), now regrettably being filled with rock waste from the Solvay Process Co. quarries along the top of the escarpment. On the return from Manlius we shall pass through the overflow channel through which flowed the waters that cut the plunge basin and its outlet channel.

<u>The Lyndon (Heard) Gypsum quarries.</u> 30 minute stop.

SPECIAL NOTICE

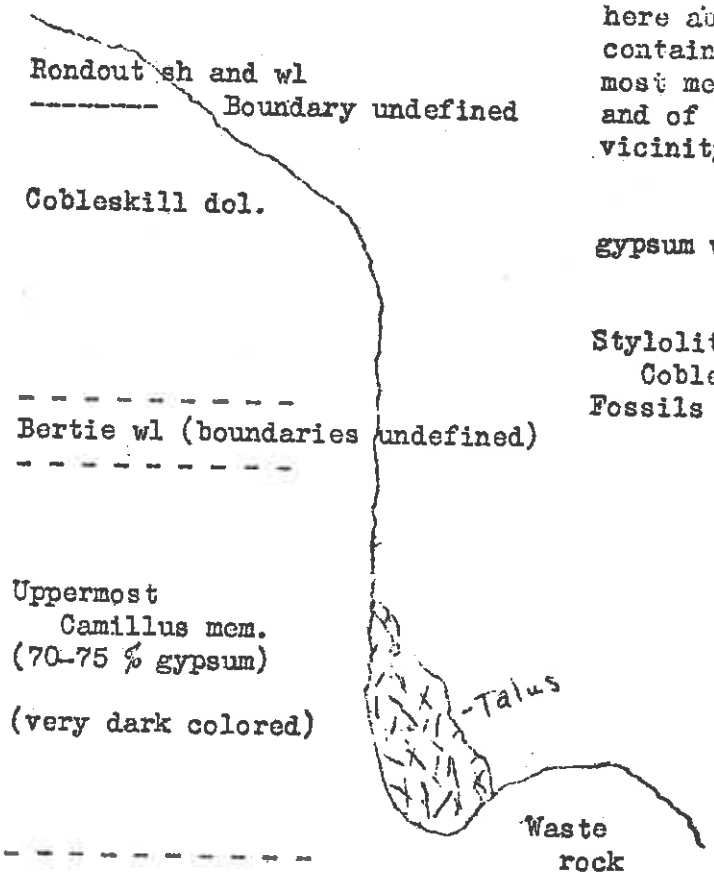
The limited extent of exposures to be examined, and the large size of the group make it necessary for each observer to limit his time in such places as will tend to become crowded. Kindly therefore, after making your observations make room for others by moving along. Only by doing this will all have a chance to examine the rocks. The leader of the first bus will blow a whistle when it is time to return to the buses.

The LYNDON (HEARD) GYPSUM QUARRY

CARE !!

LOOSE ROCK !!

Stratigraphic section.



Fiddlers Green limestone

This quarry is one of a series on this outlier once exploited for gypsum production. Quarrying operations ceased here about 40 years ago. This quarry contains the best exposure of the topmost member of the Camillus formation and of the Bertie to be found in the vicinity of Syracuse.

Additional information on gypsum will be found on another page.

Stylolites are abundant in the Cobleskill formation.
Fossils are relatively scarce.

1.6 miles to intersection of Woodchuck Hill Road and Highbridge Road.
Turn right.
The Onondaga scarp continues prominently at the right (south). At the foot of a steep grade, cross Limestone Creek, the outlet of Deruyter Reservoir.

2.1 miles to intersection of Pleasant Ave. and Fayette St. in Manlius.
Turn left on Pleasant Ave.

.6 miles to intersection of Pleasant Ave. and Cheanango Branch of New York Central Railroad. Buses stop here. All alight.
Allow about 1½ hours for this traverse.

Economic Geology
in
The Syracuse Area

GYPSUM

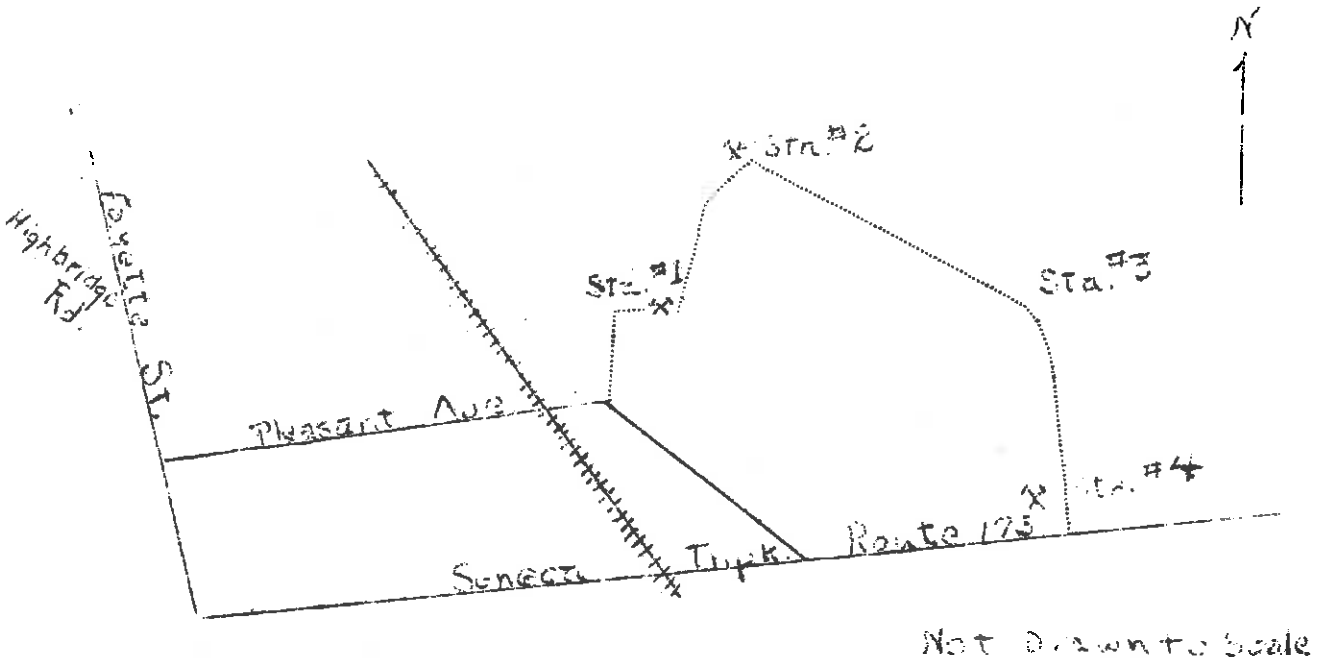
Gypsum was formerly produced in the vicinity of Syracuse from a bed 20 to 60 feet thick at the top of the Camillus formation. The first discovery of gypsum in New York is said to have been made in 1792 in the town of Camillus a few miles west of Syracuse and quarrying began in 1808.

The most important gypsum quarries in Onondaga County were those southeast of Syracuse between Jamesville and Fayetteville. The most productive of these were the Lyndon quarries about 5 miles southeast of Syracuse and 1 mile south of the village of Lyndon in an outlier of the Camillus, Bertie, Cobleskill, and Rondout formations. The gypsum bed here is 60 to 65 feet thick and directly underlies the Bertie limestone. The largest quarry in this area is about 1000 feet long and is said to have produced about 4000 tons of gypsum. This quarry was operated until 1914, but the smaller quarries nearby to the east and west have not been operated since about 1909.

The next most productive gypsum quarries were those two miles north of Jamesville near the present limestone quarries of the Solvay Process Company. Some of the gypsum here was quarried by underground methods. These quarries also have not been operated for many years. Other gypsum quarries were operated in the Onondaga valley south of Syracuse and along Nine-mile Creek between Camillus and Martisco.

Although Onondaga County has the thickest bed of gypsum in the State, it is no longer worked because the gypsum is too dark colored and too impure to be satisfactory for the manufacture of plaster. The gypsum formerly produced was sold mainly for land plaster. As there is no longer much demand for gypsum for this use, the gypsum of these deposits has not been able to compete in present markets with the purer material mined in the western part of the State.

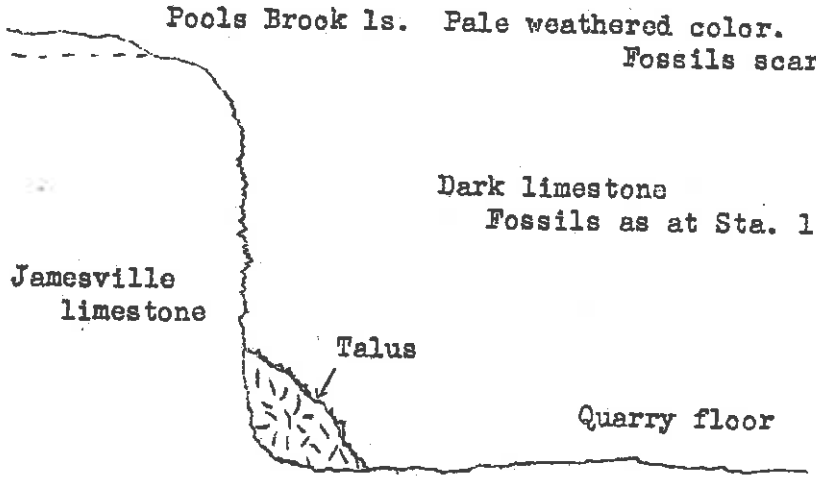
Manlius East Hill Quarries



Sta. 1. Quarry on Kenneth Ferguson farm,

Jamesville ls	Abundant Stromatoporoids Tabulate corals Brachiopods Ostracods Gastropods Etc.
Clark Reservation ls	Pale bluish color on weathered surface, dark interior, oblique joints, few fossils
Elmwood C waterlime	Buff on weathered surface, light gray inside, weathers into slabs
Elmwood B ls	"Ordinary" limestone
Elmwood A waterlime	Like C above
Clay limestone	waste pile

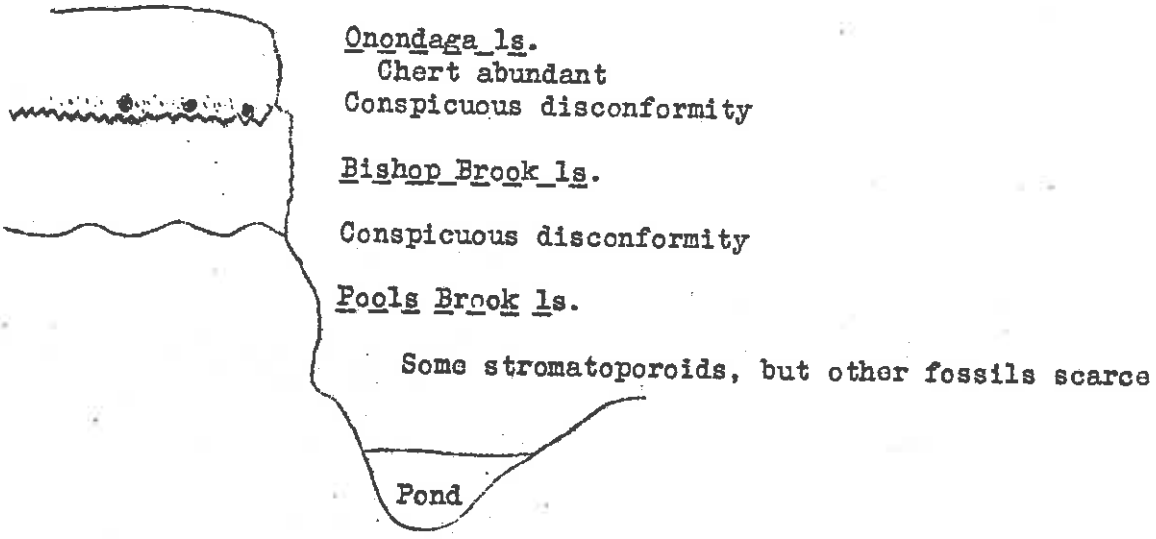
Sta. 2. Solvay Process quarry - abandoned.



Sta. 3. Cross the field and after climbing the stone fence, note the very chorty and fossiliferous Onondaga ls. capping the ledge. Undercut results from weathering of weak sandy zone at base of Onondaga ls. considered to be reworked Oriskany sandstone. This zone contains numbers of phosphatic nodules which have been weathered out and lie on the slope. In some places Onondaga fossils and occasionally derived fossils from the lower beds occur in this sandy zone. In the stone fence at this point and on the slope, Bishop Brook fossils may be found. It is not well exposed here.

Between stattons 3 and 4 the traverse is over the Onondaga limestone in the upper quarry.

Sta. 4. The Frog-pond quarry.

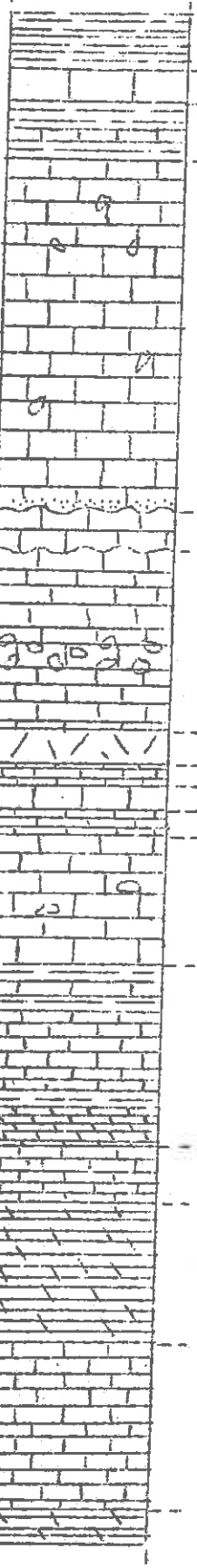


The stratigraphic units from the Olney ls to the Bishop Brook inclusive were named by Burnett Smith (Ref) but he failed to list the fossils and also failed to indicate the Silurian - Devonian boundary which still awaits positive definition.

COLUMNAR SECTION

FRIDAY FIELD TRIP OF THE N.Y.S.G.A. AT SYRACUSE. APRIL 28, 1950

Manlius section



Chittenango black shale

Cherry Valley limestone

Union Springs shale

Onondaga limestone

Bishop Brook limestone

Pools Brook limestone

Jamesville limestone

Clark Reservation limestone

Elmwood C waterlime

Elmwood B limestone

Elmwood A waterlime

Olney limestone

Rondout waterlime

Cobleskill dolomite

Bertie waterlime

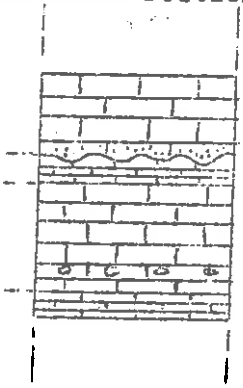
Upper Camillus(Gypsum)

Fiddlers Green limestone

Lower Camillus(Shale, Limestone, Salt, and Gypsum)

Scale: 1 in. = 40 ft.

Split Rock section



Onondaga ls.

Elmwood wl.

Olney ls.

Rondout wl.

A preliminary study of the Stromatoporoids in the Jamesville ls was made by William Pullen (now of the Illinois Geol. Survey) and the results presented as a Master's thesis. Additional studies of the Jamesville fauna are now in progress. In his Skaneateles Quadrangle report, Burnett Smith does not list as positively identified from the Jamesville, a single fossil species.

In a senior thesis, Vincent McKelvey (at present on the U.S.G.S.) listed the more abundant fossils in the Bishop Brook limestone. This fauna seems to have close affinities with that of the Coeymans ls of eastern New York. Yet Chadwick, who made a brief visit to this region (Ref) says, "the Bishop Brook ls.---appears to be essentially the topmost Becroft of Alsen". The marked erosion interval at the lowest prominent break in the sequence may mark the top of the Silurian column in this region. In his Skaneateles report, Burnett Smith puts the Siluro-Devonian boundary at the top of the Jamesville, the Pools Brook there being absent, but without discussion or defense for so doing.

Return to buses at this point.

Return westward over the Seneca Turnpike through Manlius village to Jamesville.

1.9 miles from Railroad crossing on East Manlius Hill.

Small exposure of Jamesville ls and possible some Pools Brook on the right (north) side of highway.

Buses will slow down at following exposures and stop briefly. Views from bus window.

.8 mile

A small exposure of the "Cherry Valley" ls (Agoniatite) member of the Marcellus formation on right (north) side of road. Cephalopods etc. occasionally found. An incipient cross-channel and plunge basin on the right (north) side of road.

.6 miles

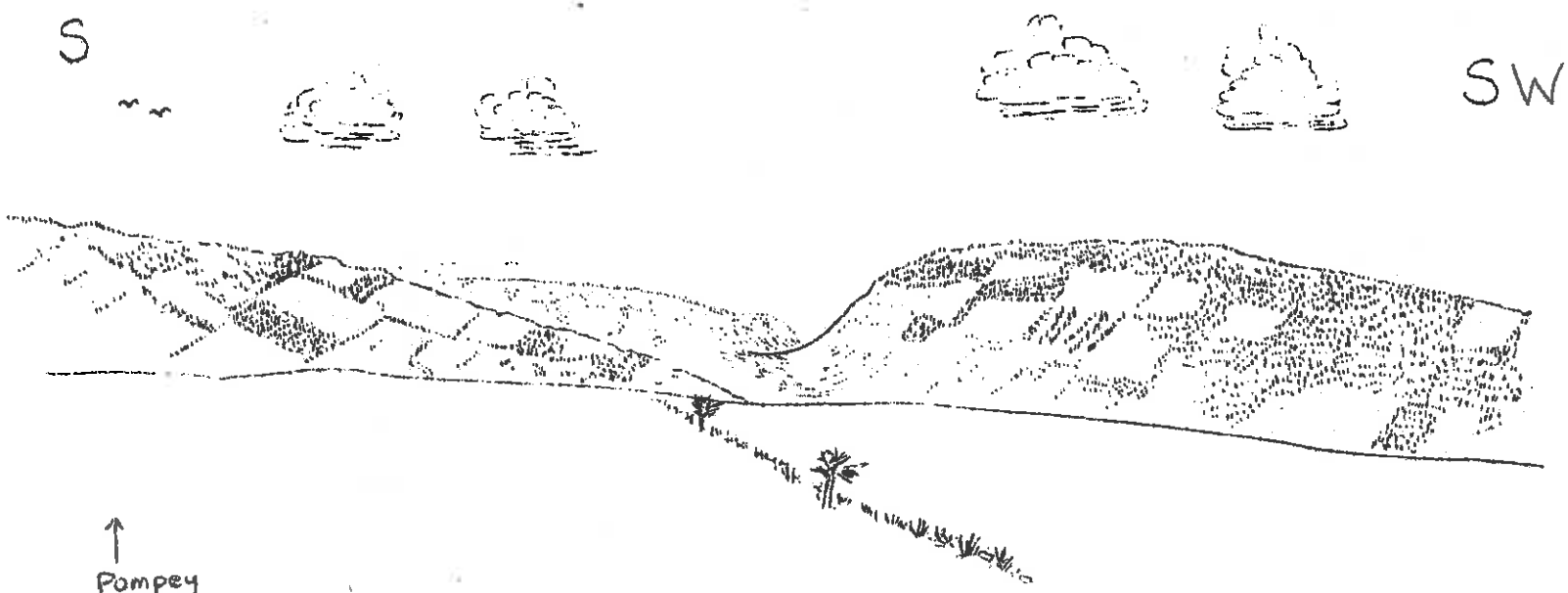
On the left (south) side of road is an exposure of a part of the Chittenango member of the Marcellus formation.

.8 miles

On the right (north) side of the road another exposure of the Cherry Valley ls. Beyond this point the highway crosses a high-level cross channel with a control elevation 780' through which poured a river whose waters came from a pro-glacial lake impounded by an ice dam across a river outlet from a pro-glacial lake in Onondaga Valley and which cut the highest high-level ("Loop") cross-channel (control elevation 840') through the Marcellus shale.

1 mile

On the right (north) side of the road is an exposure of several feet of the Union Springs black shale member of the Marcellus formation with possibly a little of the Cherry Valley ls at the very top. Styliolina fissurella is a fairly common fossil here.

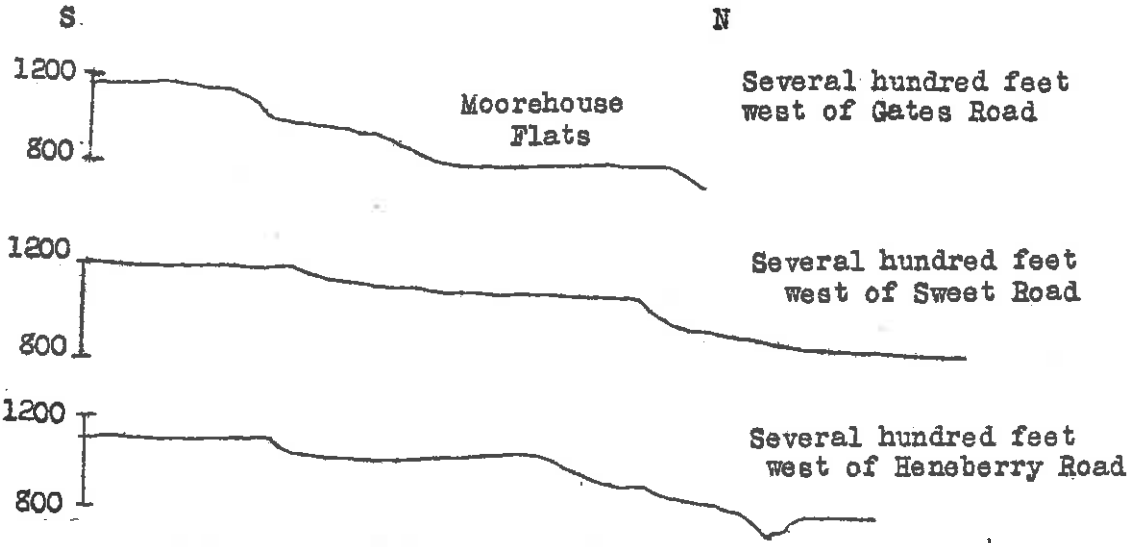


View looking into Butternut Valley from Moorehouse Flats in foreground east of Jamesville, along Seneca Turnpike.

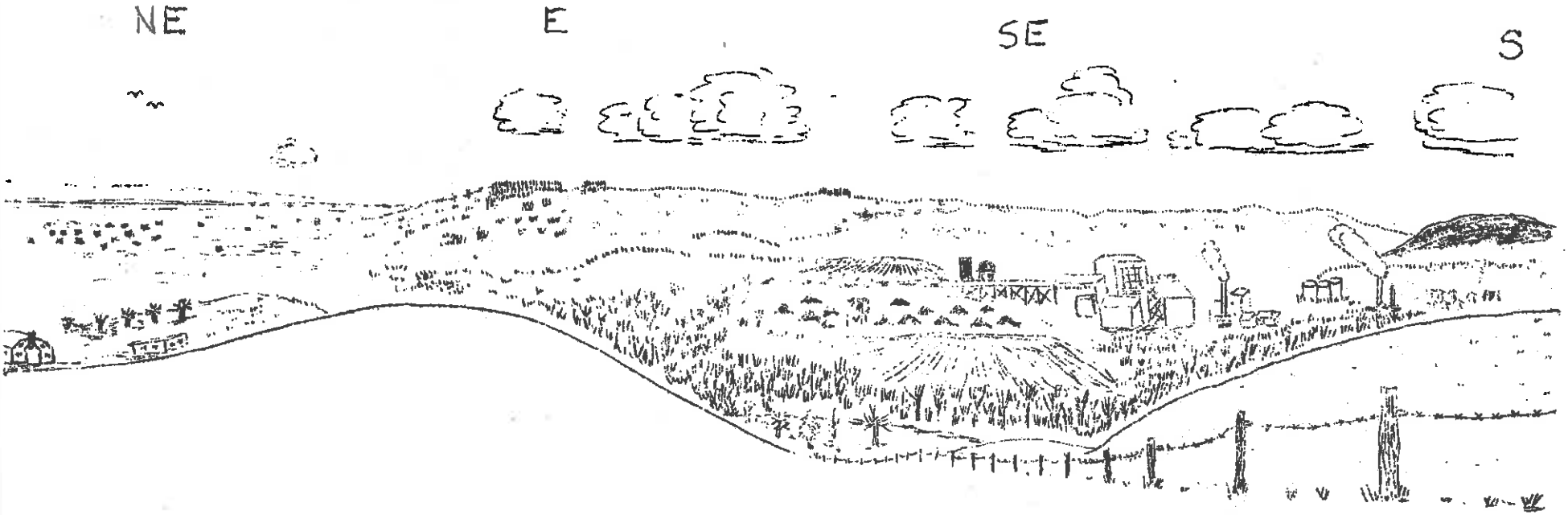
Note steep slopes along sides of U-shaped Butternut Valley.

From Manlius, the route to Jamesville along the Seneca Turnpike rises from the Limestone Creek Valley onto the front of the escarpment. The edge of the escarpment falls off to the flat, low-lying (400 feet) Lake Plain on the north, in a series of narrow benches and steeper grades. The high plateau south of Seneca Turnpike rises to more than 1600 feet. This is the north edge of the great glaciated Allegheny Plateau, which extends south to Pennsylvania.

The three profiles drawn below represent this situation.



Horizontal Scale: 1 inch equals $\frac{1}{2}$ mile.
Vertical Scale: 3 x



View from Quintard Rd.
from drumlin area
Butternut Valley in foreground

Water-swept Onondaga terrace dipping southward

Great Solvay quarries in the distance at the right. (Information on another sheet.

East end of the "Loop" cross-channel in the distance slightly to the south of west.

Glacially over-steepened slope on west side of Butternut Valley.

Down steep hill into Jamesville.
Cross Butternut Creek.
First turn right (north)
Route parallels Butternut Creek
Large cement plant on the left (west). Additional information on another sheet.

Waterfall and post-glacial gorge of Butternut Creek. Wall rock is the Fiddler's Green limestone member of the Camillus formation. Thin-bedded, dolomitic, with a few Leperditia-like ostracods. A small thrust fault with a throw of approximately 6' crosses the gorge with a W N W by E S E strike and a dip to the north of approximately 35 degrees.

Note large stone crusher of Solvay Co. at right, also huge banks of waste rock.

Take left fork and cross D.L.&W. Railroad on overhead bridge.
Road now enters the Rock Cut pro-glacial high level cross-channel.

At the top of the down-grade on the left (south) side of the road is an exposure of "Rondout" ls and shale overlying the "Cobleskill" dolomite. A persistent mineralized zone rich in celestite may tentatively be taken as the transitional boundary between the two formations. The Cobleskill has very constant color, texture, oblique jointing, solution pits and cherty nodules throughout this area. Correlation of these formations was determined by Hartnagel. (Ref)

Turn right at the foot of the hill and cross underneath the D.L.&W. trestle.

The west end of this cross-channel "hangs" about 140' above the floor of Onondaga Valley, and about 100' above the Butternut Valley floor at the east end. On the south side the lower beds of the Onondaga ls cap the cliff which is about 150' above the channel floor. The absence of this cap rock (due to dip) on the north side of the channel together with the southern exposure and weaker ls beds leaves a less prominent cliff on that side. This channel is floored on the Fiddler's Green ls. Whether or not this channel was cut by a progressively retreating waterfall over the Onondaga ls and why, if so, the bottom was not cut to the level of Butternut Valley into which the stream flowed has not been explained. The relief of the cross-channel awaits exploration. It contains ponds and marshes.

From here the route traverses the drumlin belt and crosses the broad west end of the Meadowbrook depression.

The Drumlins Country Club, where the dinner will be held at 7 o'clock, is passed on the left.

Cement and Lime
in
Onondaga County

Portland cement is produced by the Alpha Portland Cement Company in its plant about 2 miles southeast of Syracuse near Jamesville. The plant was erected in 1913 by the Millen Portland Cement Company. The principal raw materials used for cement manufacture are limestone obtained from the quarries of the Solvay Process Company nearby, and shale quarried by the company from the Marcellus formation about 4 miles south of Jamesville. The plant utilizes the dry grinding process of cement manufacture and has an annual production capacity of about 450,000 barrels of cement.

The manufacture of natural cement formerly was an important industry in Onondaga County. The Elmwood A and C formations, previously known as the Manlius waterlimes, were quarried in many places between Syracuse and Manlius for natural cement rock. These formations are each about 4 feet thick and are separated by Elmwood B limestone formation of similar thickness. The principal quarries are near Jamesville, Fayetteville, and Manlius, and the cement plants were located in and near these villages. The first natural cement produced in the United States was manufactured in 1818 from the Elmwood formations quarried near Sullivan in Madison County about 15 miles east of Syracuse. Natural cement production began in Onondaga County not long after, stimulated by the construction of the Erie Canal and continued for about 100 years until natural cement was displaced by portland cement.

Lime was formerly produced from the Manlius, Clark Reservation, Jamesville, Pooles Brook, and Onondaga limestone formations at many places along the limestone belt in Onondaga County. The principal quarries and kilns were located near Syracuse, Jamesville, and Manlius. There has been no production in recent years; and the kilns are no longer usable.

Building Stone and Crushed Stone

Limestone has been quarried for building stone intermittently in the Syracuse area. Most of the limestone formations have been used at least to a limited extent for building purposes, but the lower coarsely crystalline light gray part of the Onondaga limestone has been most favored. The largest quarry from which Onondaga limestone has been quarried for dimension stone is on the Onondaga Indian Reservation about 2 miles south of Syracuse. This quarry is not now in operation.

Crushed limestone is obtained at present from the Rock Cut quarry southeast of Syracuse and from the Solvay Process Company's quarry at Jamesville. In recent years the production of crushed rock at the Rock Cut quarry has been from stockpiles; the quarry has not been in operation. The Solvay Process Company utilizes the Clark Reservation, Jamesville and Pools Brook limestones and the lower relatively pure part of the Onondaga limestone for the manufacture of soda ash and other products. The less pure parts of the Onondaga that must be quarried are sold for crushed stone and other uses, or become waste.

Several abandoned quarries from which crushed rock was obtained are located near Syracuse. Quarries have been opened in all of the limestone formations, but rock from the Manlius and overlying limestone formations is preferred.

NEW YORK STATE GEOLOGICAL ASSOCIATION

Silver Anniversary Meeting
April 28 and 29, 1950

Syracuse University
Syracuse 10, N. Y.

Saturday Field Trip

Buses will leave the College Place entrance to the campus at Sims Hall at 9:00 A.M.

The route between Syracuse and Jamesville will go out Comstock Ave. to Ainsley Drive to E. Brighton Ave. to Jamesville Toll Road, to Jamesville, repeating a small part of yesterday's trip. From Jamesville the route will be westward by way of Seneca Turnpike through Onondaga Valley to Onondaga Hill village, to Split Rock, to Cedarvale, to Otisco Village, to Vesper, to Tully Center then northward to Cardiff, to Onondaga Indian Reservation and back to campus.

There will be no lecturing. Follow your guide books, please. Turn east on Euclid, then south on Comstock. At Colvin St. crossing note broad west end of Meadowbrook depression, and numerous drumlins. Turn here to beyond the R.R. overhead crossing on Brighton Ave. We are on the Fiddler's Green ls. Scattered outcrops are present. The D.L.&W. R.R. cut exposes a good section to be seen from the bus windows.

At the left (east) near Ainsley Drive is an old quarry exposing the Cobleskill at the base, and the Rondout at the top of the section. Brief stop only.

Going across D.L.&W. R.R. overhead bridge. See Fiddler's Green ls from bus windows.

Note Onondaga Valley at the right and the extensive sand and gravel terrace on which are located the San-Equip Corp. plant and Loretto Rest Home for Aged.

Turn left (east) along old Jamesville Toll Road, through the Rock Cut cross-channel. The road now follows along the south side of the Rock Cut cross-channel referred to in the Friday Guide Book.

Continue on into Jamesville. Turn west on Seneca Turnpike to Clark Reservation.

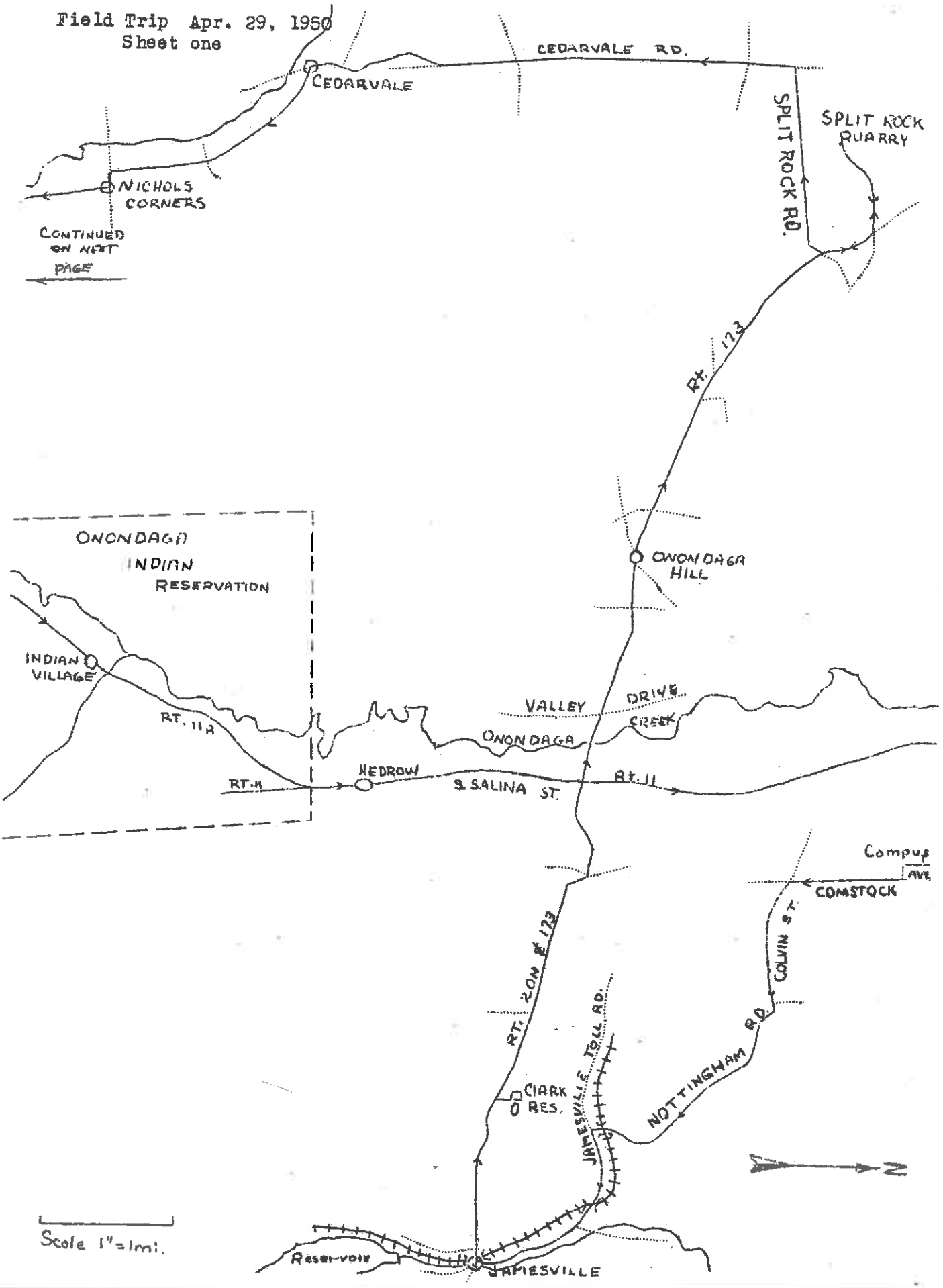
Stop 1. Clark Reservation State Park. Allow abour 30 minutes for this stop.

Note
(a) glacial river-washed terraces over Onondaga limestone
(b) glacial river-cut plunge basin lake and outlet channel
(c) channel leading to brink of extinct cataract
(d) cap rock Onondaga limestone
(e) divided channel with rock "island"
(f) depressions in channel

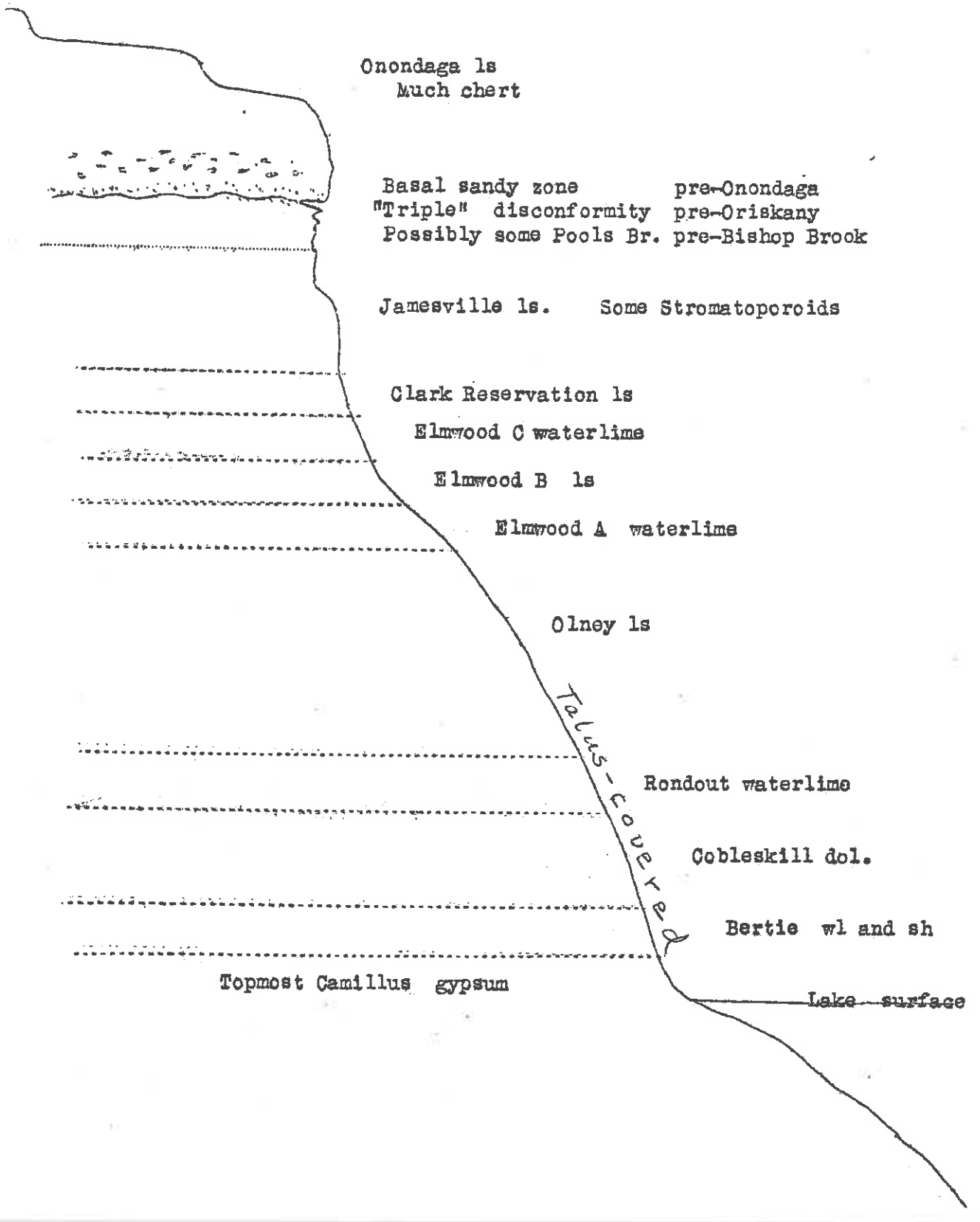
The plunge basin lake is spring-fed and partially filled and filling with talus, marl, and decaying vegetation. Maximum present depth reported about 60'. Surface elevation of the lake is about 600'. Water from this glacial river went eastward into limestone valley through the white lake cross-channel noted on yesterday's trip.

N.Y.S.G.A.

Field Trip Apr. 29, 1950
Sheet one



Stratigraphic section at the Green Lake(Clarke Res.)stairway.



Leaving Clark Reservation Park turn right (west) on Seneca Turnpike.

For some distance the road runs along the base of a slope on the left (south). On the right (north) for some distance much bare rock (Onondaga limestone) is visible. This region was swept clean by the pro-glacial river waters which finally at the east cut the great plunge basin and its outlet channel just seen.

Continue down the hill into Onondaga valley. About half way down the hill cross a sand and gravel bench at an elevation of about 500 feet, which is slightly below the control level of the Rock Cut cross-channel. The occurrence of this sand and gravel deposit along both sides of Onondaga Valley provides an abundant source of this material for construction purposes.

Crossing Onondaga Valley. Detour.
Post-glacial alluvium resting on glacial-lacustrine beds. Contact not exposed. Valley fill here is deep.

A Pleistocene conglomerate at the head of the ravine (Hoppers Glen) on the left (south) and also at the top of the slope on the right (north). Momentary stop only.

Enter Onondaga Hill village. Take right fork on Velasko Road and route 173.

Just beyond the County Hospital an exposure of the Chittenango member of the Marcellus formation on the left in the steep slope some distance from the road. Slow down only.

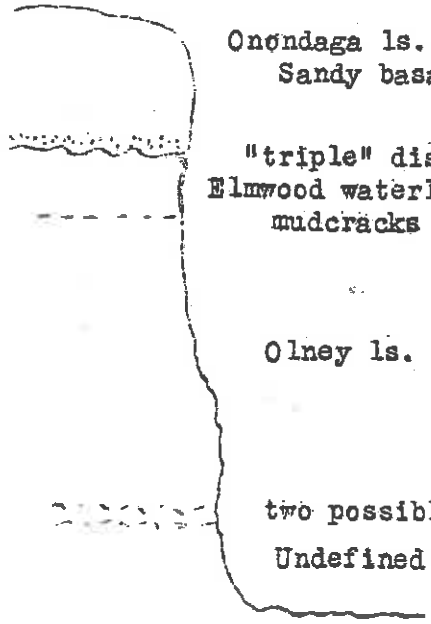
At junction Howlitt Hill Road and Velasco Road a small exposure of Union springs shale on right (north) side of the road. About 100 feet further on the left (south) side of road a few feet of uppermost Onondaga ls. Relatively thin bedded, cherty and with the "pink" Chonetes shells in some abundance. Momentary stop only. Water washed terrace on Onondaga ls just beyond.

Crossing Chryslers ravine. A splendid section here. (Ref. Chadwick) Camillus to Onondaga with Jamesville, Pools Brook, Bishop Brook and Oriskany missing. Not feasible for large group to examine this.

Continue on past Split Rock Corners to the Split Rock quarry. STOP. The section in the quarry ranges from some undefined units at the base through the Olney and one of the waterlimes into the Onondaga ls. (Ref. Smith)

Split Rock Quarry Section

Allow about 30 minutes for this stop.



The Elmwood B and C, Clark Reservation, Jamesville, Pools Brook and Bishop Brook formations - all limestones - as seen at Manlius yesterday, are missing here as a result of one or more erosion intervals.

On the south side of the quarry is a splendid coral biostrome in the Onondaga limestone near its base. Tabulate corals predominate.

Return to buses.

Retrace route to Split Rock Corners. Take right fork. Route 173, Split Rock Road. To Cedarvale Road, through Cards Corners to Cedarvale, to Nichols Corner, to South Onondaga.

In the beautiful Cedarvale gorge note an exposure of the Chittenango black shale member of the Marcellus formation. Some large concretions may be seen.

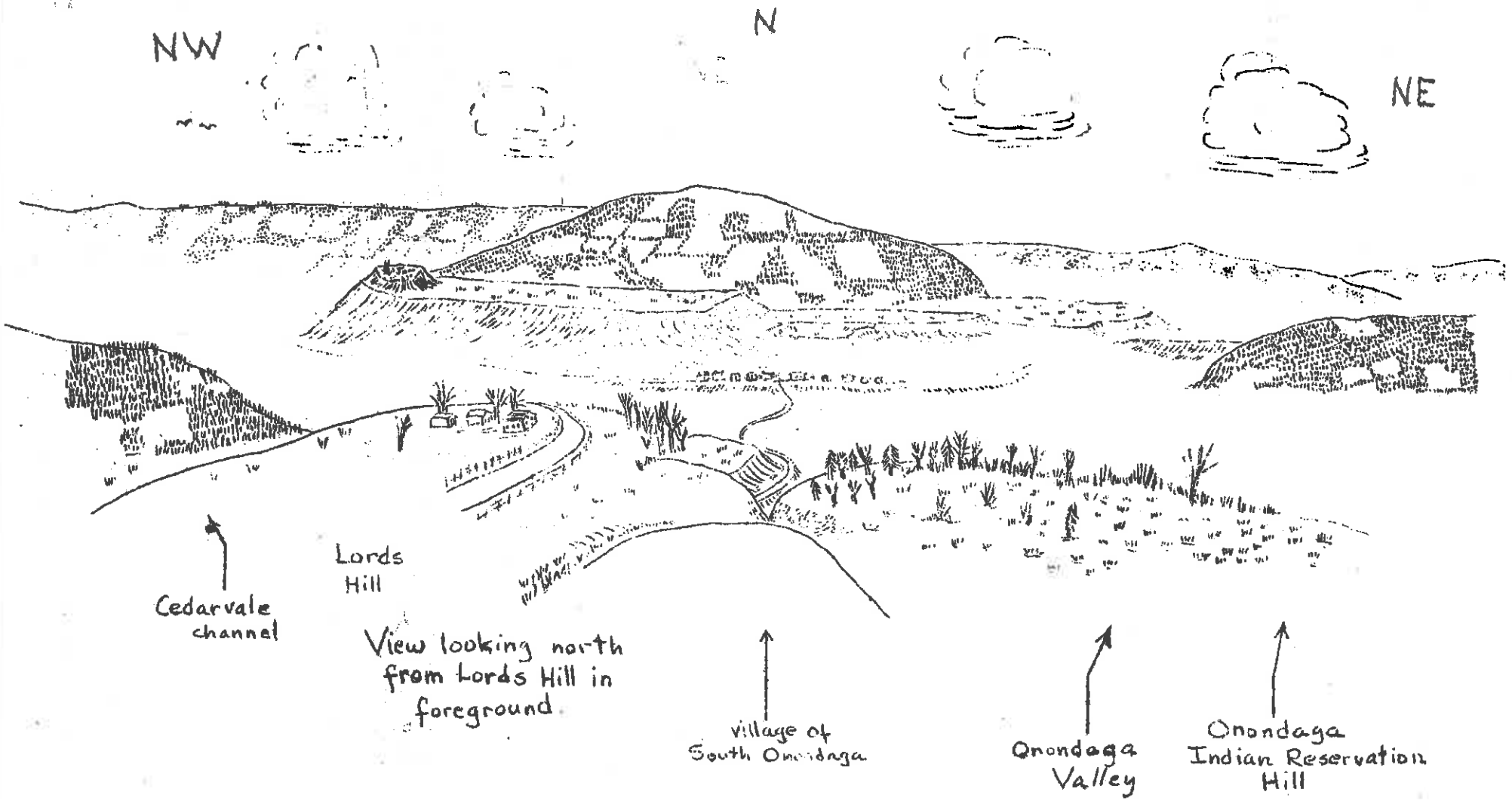
Next - entering the great Marcellus-Cedarvale-South Onondaga high level pro-glacial cross-channel through which flowed a river coming from a pro-glacial lake in the Otisco Lake-Nine Mile Creek-Marcellus Valley. The final control elevation in this cross valley is about 690'. For a time, then, these waters could have flowed eastward by way of the Rock Cut.

Extensive deposits mapped by Fairchild as glacial deltas make striking topographic features in this valley. We shall pass several exposures of these deposits.

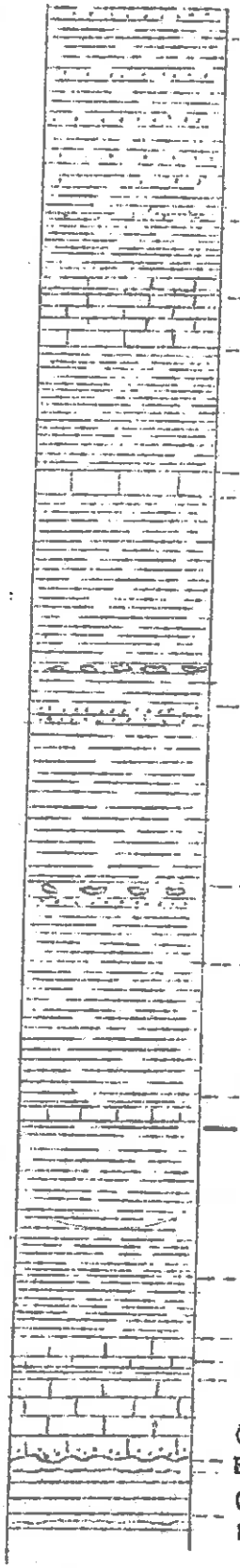
In South Onondaga turn right (south) on route 80. Stop at Cherry Valley Turnpike. Route 80.

LUNCH

Messrs. and Mrs. Hayden have generously offered us the use of their lawn and facilities for rest and lunch. Please cooperate in showing our appreciation of this courtesy. As soon as you have finished lunch you may walk up the hill to the south on Route 80.


NW
N
NE
Lords Hill
Cedarvale channel
View looking north from Lords Hill in foreground
village of South Onondaga
Onondaga Valley
Onondaga Indian Reservation Hill

COLUMNAR SECTION
Split Rock-Tully Valley
SATURDAY FIELD TRIP OF THE N.Y.S.G.A. AT SYRACUSE. APRIL 29, 1950



Ithaca flags and shale

Sherburne flags and shaley sandstones

Geneseo black shale

Tully limestone

Windom shale

Portland Point limestone

Ludlowville shale and sandy shale

Coral biohem

Butternut shale and sandy shale

Pompey shale and sandstone

Delphi Station shale

Mottville shale and limestone

Cardiff shale

Chittenango black shale

Cherry Valley limestone

Union Springs shale and limestone

Onondaga limestone

Elmwood waterlime

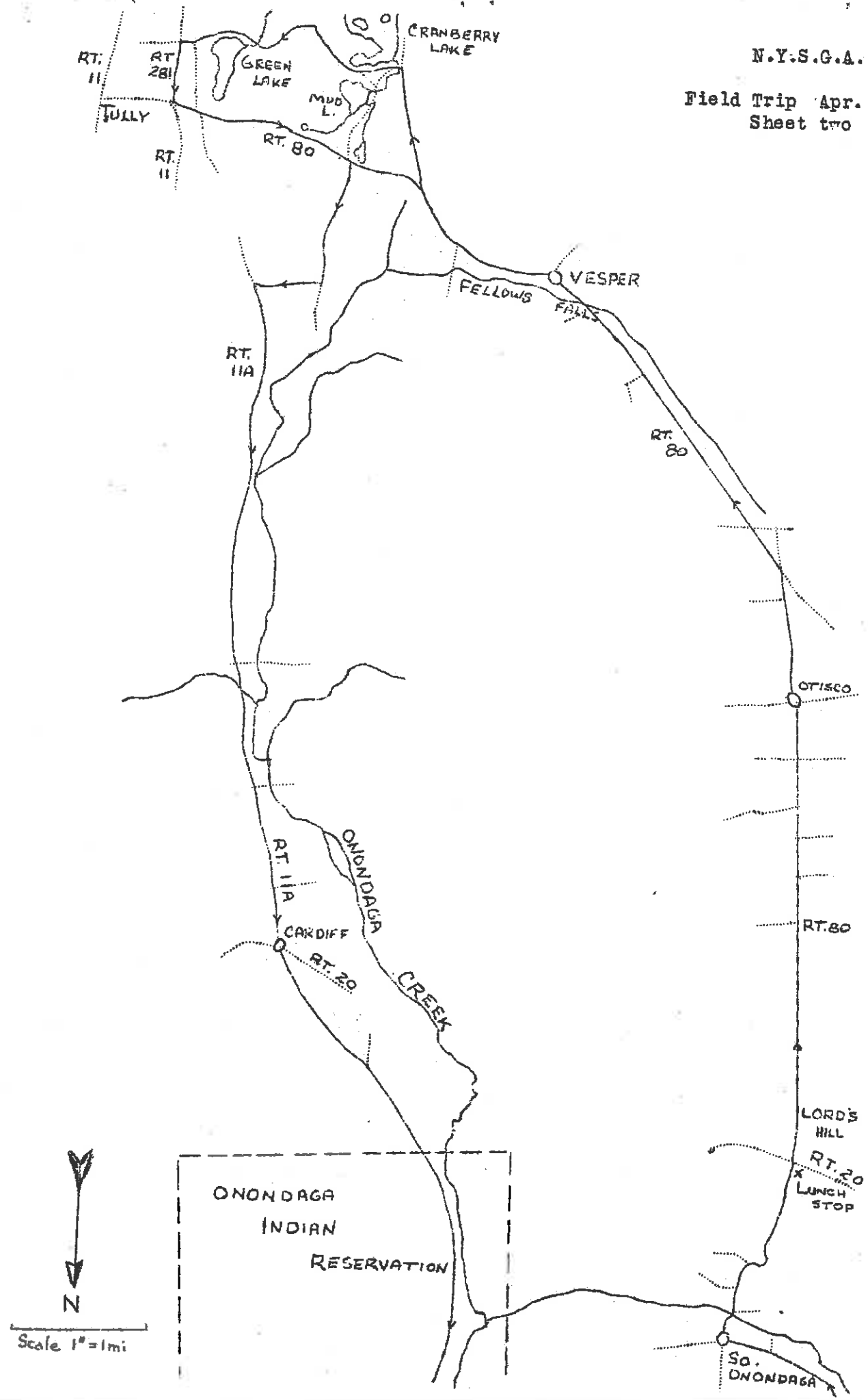
Olney limestone

Rondout waterlime

Scale: 1 in. = 200 ft.

N.Y.S.G.A.

Field Trip Apr. 29, 1950
Sheet two



A great bioherm mainly of corals, in the Ludlowville shale member of the Hamilton. Fossils begin to be abundant in the first ditch exposure at the foot of the hill. Brachiopods, trilobites, bryozoans, cephalopods, pelecypods.

Buses will await us at the crest of the hill.

Look back over the lower Onondaga Valley toward Syracuse.

Now going over the heavily ground moraine-covered plateau upland.

Note a south easterly trending valley tributary to Onondaga Valley--a barbed tributary--suggestive of inheritance from a southward drainage possibly early in Tertiary time.

Pass through Otisco village.

Upland topography continues. Beyond Otisco village enter Vesper valley - another barbed tributary trending south eastward but now entering north-flowing Onondaga Creek. (Ref. von Engeln)

STOP. Alight. Looking across Onondaga valley and at the north facing "ice-contact"slope of the Tully recessional moraine from which an extensive outwash plain leads southward to Cortland and beyond. More of the moraine and plain will be seen further on.

The surface of the outwash plain lies at an elevation of about 1200'. The 600' contour crosses the valley a short distance north of the foot of the ice-contact slope. The depth of the valley fill has unofficially been reported, as determined by geophysical surveys, to be about 600 feet maximum. At this depth the rock floor of the valley is about at sea level.

The salt wells are located along the valley sides where the drift is relatively shallow. Salt is believed to occur (facts are officially unobtainable) at a depth of 1200-1400 feet below the surface.

On the right (west) side of the road note a distinct rock terrace made by the Tully limestone.

A bit further along is an exposure of several feet of the Windom (Moscow) shale member of the Hamilton. Fossil brachiopods, trilobites, bryozans, pelecypods, cephalopods, present.

Take right road fork.

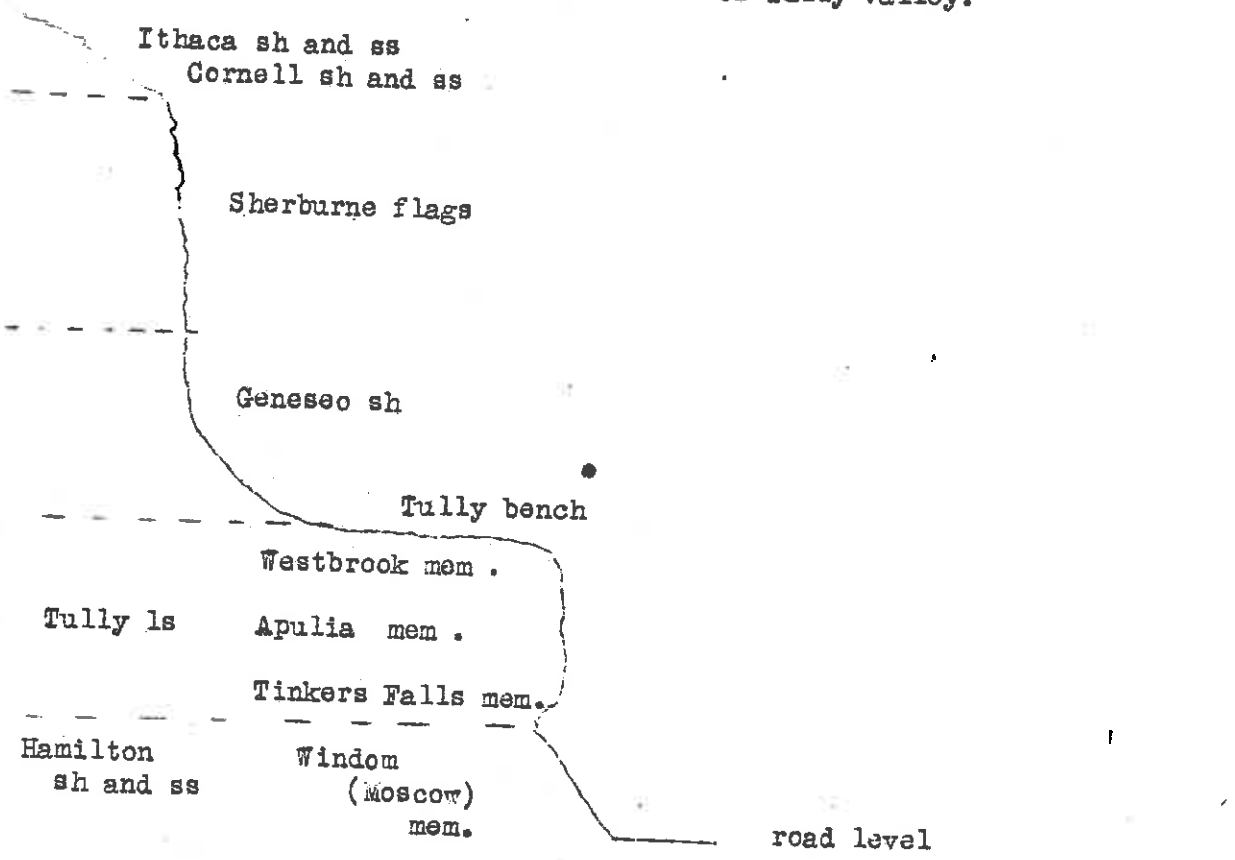
On the left (east) note moraine topography.

STOP. About 30 minutes here if time permits, to examine a section ranging from the Windom (Moscow) shale to the Ithaca sh and ss.

Stratigraphic Section

(on next sheet)

Stratigraphic section on the west side of Tully valley.



Continue for a short distance along the valley side, then turn left.

Pass through a region with numerous kettles and kettle lakes.

A gravel pit on the right (south) side of the road exposes poorly a section of the sand and gravel of the outwash plain.

Momentary stop.

Looking to the right (south) note the outwash plain and the glacially-steepened valley sides. Project these slopes downward and contemplate the probable valley shape beneath the glacial fill, which may be as much as 1000' deep.

Drainage directions here may have been as follows:

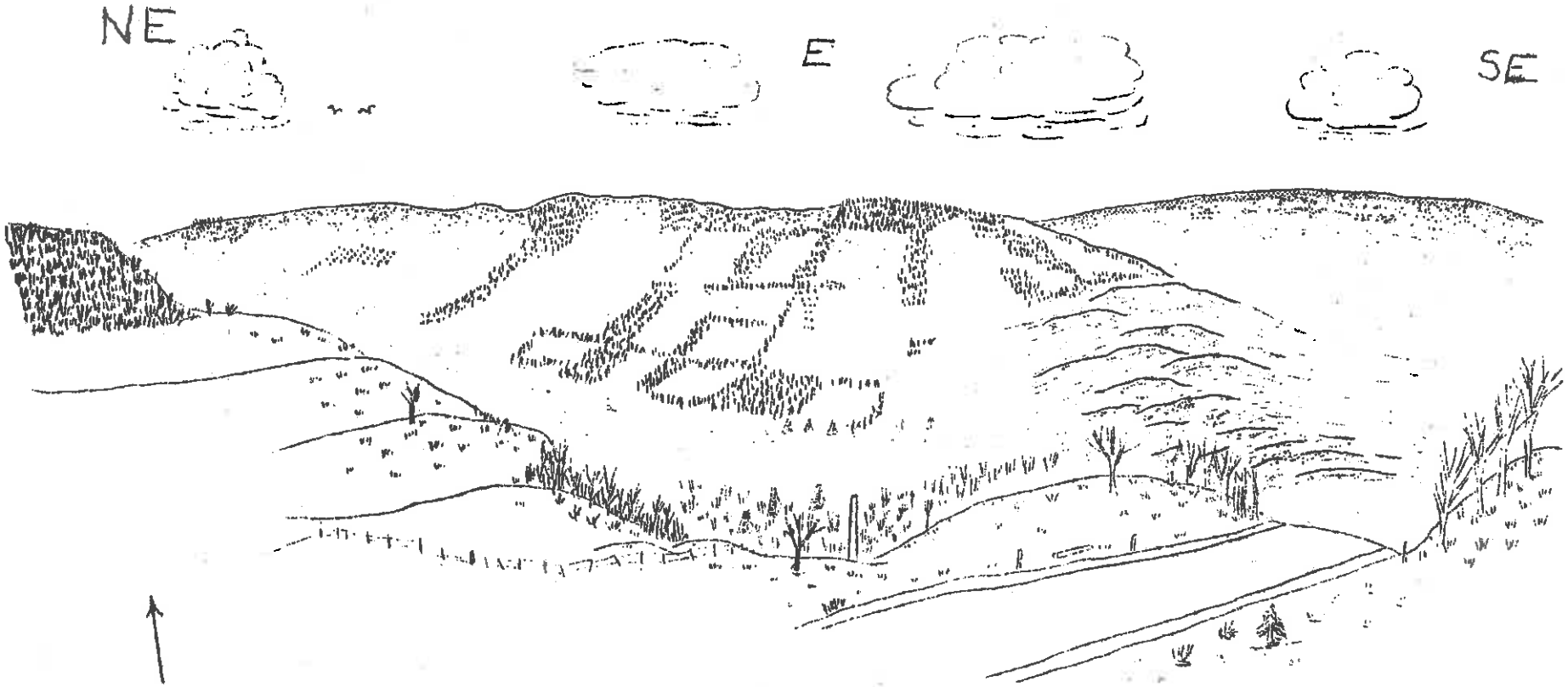
Original drainage on late Paleozoic coastal plain south westward

Pre-glacial Onondaga Creek had its head waters at Cortland or beyond flowing northward

Glaciation filling the valley with moraine and outwash cut off part of Onondaga valley leaving present southward drainage from the moraine into the Susquehanna system by way of Tionghnioga River.

Turn left (north) to Tully Center, then left (west) through end-moraine topography.

Turn right into ravine cut into ice contact slope of the end-moraine. Momentary stop at a large gravel pit on the right (east) showing the materials and structure of the end moraine.


NE
E
SE
Dutch Hill
View looking east from Skaneateles-Hamilton Hwy. on west side of Onondaga Valley, east of Vesper.
Deep part of Valley – area of salt wells
Tully Moraine
Outwash and lakes in outwash

Continue a short distance down the slope on the Tully Farms road. Turn right (east) on the Solvay road to route 11A.

Note salt well "derricks" on both sides of the valley. Fresh water is obtained from the lakes on the outwash plain, distributed to the various wells, returned to the surface as brine, and then flows to the chemical plant at Solvay. The drop is about 350' from the well mouths to the plant.

In contemplating the glacial features in the Onondaga Valley region recall that the final control elevation of pro-glacial waters across the Tully moraine was about 1200 feet and that the next lower possible outlet of pro-glacial waters out of Onondaga Valley was eastward at a final control level of about 820-840' through the highest ("Loop") high-level cross channel south of Jamesville. Problems to consider are whether the ice front of the glacier tongue in Onondaga Valley had a more or less vertical front receding gradually northward with an open lake in front of it or whether this front became a stagnant mass with an accumulating over-burden of rock debris consisting in part of ablation moraine augmented with debris swept in by drainage from the surrounding slopes and from the stream coming through the Marcellus-South Onondaga valley: Or what other alternatives might explain the lateral benches along the valley side and the vast deposits in the great tributary valley coming in from the west, and those on the east side of the valley.

Continue northward along route 11A. Pass through Cardiff, the locale of the great "Cardiff Giant" hoax.

Beyond (north of) Cardiff note the front of a vast deposit of sand and gravel on the left (west) side of Onondaga Valley. Note the present narrows just above the new flood-control dam. Problem: When and how did it originate?

STOP. The new Onondaga dam is an earth dam faced with clay and broken stone intended to impound excess flood waters.

The raw materials used for the dam, both rock and fill came from nearby sources--the gravel from near the west end of the dam and the rock from the outlet channel and the spillway at the east end. The rock section exposed in the excavation ranges from the Olney ls up into the Onondaga ls.

Passing through the Onondaga Indian Village.

From the lower level of Onondaga Valley we rise onto an extensive sand and gravel terrace on the east side of the valley.

At the foot of the slope on the right (east) side of the valley note the large quarry in the Onondaga limestone.

Now entering Nedrow (Onondaga Castle) a suburb.

RETURN TO THE CAMPUS

Salt at Syracuse

The salt industry of the State had its beginnings in the vicinity of Syracuse and was an important factor in the location and early development of the city. Salt springs north of Syracuse on the east shore of Lake Onondaga were long known to the Indians and were used for salt by Jesuite missionaries in 1653. Both the Indians and the occasional white traders obtained salt from these springs before the Revolution.

The salt industry is said to have begun in 1788 near the southeast end of Lake Onondaga, but it wasn't until 1793 that a regular salt works was built. After that the output of salt increased rapidly to a maximum production of 9,053,874 bushels in 1862. Thereafter production declined so that by 1908 the output was small and by 1927 had ceased altogether. From 1797 to 1904 over 12,000,000 tons of salt were produced. The major causes of the demise of the salt industry in Syracuse were competition from other salt producers elsewhere and the decline in the salt content of the natural brine. Interesting relics of the salt industry may be seen at the Salt Museum at Liverpool on the northeast shore of Lake Onondaga.

The Syracuse natural brines were pumped from glacial sands and gravels contained within the partly buried Onondaga valley near the southeast end of Lake Onondaga. The salt wells were drilled to a maximum depth of about 400 feet. As deep test borings failed to show any salt beds underlying the area near the lake it is believed that the salt was dissolved by groundwater from the salt beds to the south and the brines concentrated in the valley fill.

Several beds of salt, up to 74 feet in thickness, are interstratified with shales in the lower part of the Camillus formation except near the outcrop of the formation where the salt has been dissolved.

In 1888 the Solvay Process Company of Syracuse drilled wells to these beds in the Tully Valley about 10 miles south of Syracuse. Numerous wells about 1200 feet deep have been drilled since that time and the artificial brine obtained, by dissolving the salt in water pumped in from the surface, is piped to the company's plant at Syracuse for use in the manufacture of soda ash and other products.

New York State Geological Association

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