N.Y.S.G.A. Meeting Ithaca 1928

Field Trip, Friday, May 11.

4th meeting 1928.

Leave from west side of McGraw Hall, 2 P.M. (daylight saving time.)

To save time cars are requested to keep in line. A Department car will act as guide, and a second will bring up the rear.

When the warning whistle is blown, please get ready to leave as soon as possible.

Sheets - Genoa and Ithaca U.S.G.S. sheets (10¢ each), or Dep't. of Geology map (20¢).

Contrib. by O.D. von Engeln

Stop I

On bridge at Thurston Avenue. Upstream: waterfall recession, plunge pool, widening of gorge by lateral cutting and weathering. Gorge here post glacial. Note wide valley of lake area above fall.

Downstream: Note flat, or terrace, above level of rock bottom of present gorge on right (north) side. This flat has a rock floor. At back (north) it is terminated by a mass of morainic material, no rock. Note rock at up and downstream sides of flat.

This flat is floor of an interglacial gorge here intercepted by present post glacial gorge. Its continuation swings around to north and east and connects up with the Beebe Lake (above dam) area. The fact that floor of interglacial gorge is above bottom of present gorge suggests that interglacial base level was higher than present base level, especially in view of the fact that interglacial gorge was opened longer and wider than is post glacial cut.

Thin bedded sandstones and shales of upper Ithaca beds in Middle Portage, Upper Devonian, above the dark Ithaca Shale, Brachiopoda - Stropheodonta mucronata and Cyrtina hamiltonensis very abundant.

Joints. Note master joints (N.S. & E.W.) in bottom of stream below bridge, and in sides of gorge above bridge. Their angle of intersection and the fact that they occur in systems is well illustrated in stream bottom.

Sedimentation. The sides of the gorge show alternating sandstone and shales This is repeated so often that it has the appearance of cyclic conditions; cause? Annual? Change of level?

Look back at site of Baker Laboratory (chemistry) on top of high level (fossil) delta terrace.

Stop 2.

Limestone quarry at Portland Point.

Section involves. 1. Glacial drift. 2. Genesee shale (black thin bedded) in part removed by glacial erosion. 3. Tully limestone on crest of anticline, thickness about 25 feet. 4. Calcareous Hamilton shales extending down to railroad track. The term Moscow is applied to that portion down to the Encrinal limestone, and Ludlowville shale from railroad track to lake level.

Structure. A broad low fold, has been formed on the usual regional dip to the south. This is reason for location of limestone quarry, as it has brought the Tully near enough to the surface to be economically quarried. Fold strikes practically due E-W and plunges westward at the rate of 35 ft. per mile. This gentle fold is the surface expression of very close contorted folding in the salt layers 1000 ft. below. To the east the fold is covered with glacial drift and is not recognized in the Broton section, 5 miles away.

In the south west part of the quarry there is a thrust fault, dipping to the south. The angle which the fracture cleavage makes with the vertical is the same (approximately) as the angle of dip of the fault plane.

The fold, faults and joints are supposedly all formed by the Appalachian revolution with the stress from the south.

Dike:- In the N-S joints there occurs one of the largest peridotite dikes of the region. It contains inclusions of local rock. No contact metamorphism is observed. Slickensides are frequently found.

View from quarry:- If clear note wide flats of Salmon Creek (on right, east side) and of Taughannock Creek (on left, west side) deltas built into lake. These correspond in modern lake to tops of similar deltas built into higher levels of lake during ice retreat. All of territory along road up to level of 900 A.T. in this section under such lake waters and is veneered with varying thickness of lake clay deposit. Overflow channel of lake (Lake Newberry) was across West Hill slope (far side of lake) into Seneca Lake basin, and from it through Horseheads channel into Susquehanna.

Stop 3- McKinneys. Along shore north of McKinney's notice excellent jointing in Sherburne, lower member of the Portage. If these were formed during the Appalachian revolution, they have the peculiar position of being either parallel or at right angles to the stress.

At lake level, in greenish gray fine sandstone there occur Buchiola retrostriata and Manticoceras intumescens in fragments.

At head of lake notice delta and floodplain of Inlet Creek.

The saltworks at Renwick penetrate to the Salina salt beds which lie from 2200 to 2800 feet below lake level.

Stop 4. Ithaca Falls. Notice step formation of falls due to creek flowing over master N-S joint planes, and also to thin bedded character of rocks.

Rocks are lower Ithaca shale in mid-Portage, showing at foot of falls the most famous out cropping of Spirifer levis bed in a hard sandy layer.

Dinner Friday night, 7:15 p.m.
in Prudence Risley Hall.

This is located on Thurston Ave., just across bridge where party makes first stop Friday afternoon. It is the large building on left. Cars can be parked in driveway in front of building during the dinner.

Saturday May 12 - 1928----McGraw Hall, 8:30 a.m. Daylight Saving Time.

Enfield Glen and Taughannock Gorge and Falls

All day trip. If you wish to have lunch provided, get ticket for same for 50¢ on Friday at Geology Department office, before 1 P.M.

Ithaca and Genoa topographic sheets. Marked copies on sale at McGraw Hall. Numbered circles indicate stops, arrows point to features seen at stops ~~on~~ enroute.

Stop I. To east of "R.R. stop" warning sign. In foreground alluvial fan, low, and flat Cayuga Inlet flood - and delta plain. Water well and salt well borings show that depth of fill is at least 430 feet. At base morainic deposits, next lake clays of high level, deep pro-glacial lakes, then probably Iroquois lake coarse sediments, shallow water deposits, higher level modern deltaic and alluvial deposits.

Coy Glen high level ("fossil") delta terraces. Four distinct levels can be seen. Higher levels due to ice barrier across Cayuga Valley. Successive overflow levels (now) at 1040, 980, 900 feet A.T. Tilt to north at rate of 2.7 to 2.9 feet per mile since glacial times.

Buttermilk Interglacial gorge outlet, just behind barn on left side of road. Diversion to new post glacial course of this stream seen at Stop 2.

Stop 2. Buttermilk post glacial gorge and falls. Slight amount of recession of falls from slope face of oversteepened main valley rock wall. Rock formation. Lower portion of Ithaca stage, upper of Enfield. The latter is sparsely fossiliferous throughout.

Delta gravels, excavated for concrete construction on south side of gorge. Best seen by looking back enroute after leaving falls. Note clear showing of fore-set beds, steep inclination on front of delta. Buttermilk Creek a hanging valley as are all of tributaries to Inlet and Cayuga Valleys from east and west.

Enroute. Notice oversteepened valley slope with small postglacial stream cut on left. (arrow) Also delta terraces of Buttermilk.

On right (arrow) morainic topography where glacial fill emerges from beneath delta etc, lake fills of later accumulation.

At top of hill (arrow) view south overlooks in-valley divide between Susquehanna and Great Lakes drainage. Divide is on marked morainic loop (end moraine) across Inlet Valley. Inlet Valley a glacial trough, overdeepened--- note steep concave slopes on east side. Route of Lehigh Valley railraod east, a "through valley" across the plateau border.

Along road to entrance of Enfield Glen. Various phases of morainic deposits, also of high level delta accumulations from temporary ponding of side, Enfield valley.

Stop 3 Enfield Glen. Type locality of Enfield formation, or member of the portage. These are above the Ithaca beds and below the introduction of the typical Chemung faunas, with Spirifer disjunctus.
Notable development of joint planes, two sets, effect on stream course, right angle turns, erosion by joint blocks. Effects of weathering on jointed structure.

Gorge result of diversion of stream by morainic barrier to new course, post glacial.

Course just above gorge interglacial. Just below big falls (Lucifer Falls) post glacial gorge enters into interglacial gorge again.

Potholes at intersections of joints. Amphitheatres in course of gorge, development.

Hanging valley condition as observed from crest of big falls. Applies to interglacial gorge at lower level.

Enroute to Taughannock. Note mature, pre-glacial upper Enfield (Five Mile Creek) valley, probably in some degree modified by ice erosion. (arrows).

Note level summits of plateau uplands, two altitudes, that along road approximately 1400 feet A.T. considered to the "Mine Ridge" peneplain, that to south at 1600-1800 feet A.T. the warped Schooley peneplain. The highest, Kittatinny, surface at 2000 feet represented in this region only by isolated "monadnocks" of which Connecticut Hill (see map) is an example. (These determinations based on work by H.M. Fridley, unpublished Ph.D thesis).

Stop 4. Taughannock Falls. View from above. Section extends from Portage, grading into about 125 feet of Genesee, and ending with Tully at bottom at mouth of gorge. This section shows the effect of a retreating sea. Notice that the changing conditions are in general reflected by gradational contacts between these formations.

En route. Retrace course to south side of gorge and go down road oversteepened Cayuga Valley slope from 900' A.T. down) Stop just below hospital for view of gorge, widening by lateral cutting. Genesee-Portage contact. Road descent steep, use your gears.

Stop 5. Taughannock delta. Extent, coarseness of top set beds, slopes.

Lower Falls. Over Tully limestone, Moscow shale (Hamilton) below, very fossiliferous, Genesee shales above all way up gorge. Solution pits on surface of Tully above falls. Gradational transition from Tully to Genesee deposition.
LUNCH HERE.

Up Gorge. Talus cones, joints, buttresses and recesses. Weathering stains on gorge walls. Beautiful illustrations so called "mud flow" structure are found in the sandstones. This is really a type of scouring. The flag-stone steps in the middle of the gorge show some excellent examples. Devonian land plants have been found here. These upper stronger rocks were probably original capping rock of falls. But falls retreat has not kept pace with retreat of capping layer. Retreat now largely due to frost weathering of joint blocks of Genesee shale below crest, development of amphitheatre. Crest of falls formerly projecting V now re-entrant. Falls will probably degenerate into series of step falls in short(geologic) time.

At Falls. 215 feet high. Clearing of gorge of talus alternately by swinging and lateral erosion of stream.

Small peridotite dikes. Jointing.

Return to Ithaca. Those who wish may leave partly for return to points north by automobile at Jacksonville.

Note fold on far side of lake, seen at Crest on Friday. Also south of Ithaca. Portage escarpment, edge of upper level of plateau (Schooley peneplain) about as continuous and prominent here as anywhere along plateau front. It is the scarp slope of the Fall Creek valley which pursues a subsequent course at the base. See the long dip slope leading up to foot of scarp. (Cuesta) Ithaca Falls, from hanging valley of Fall Creek . University on an interstream shelf between mouths of Fall Creek and Cascadilla Creek.